MODELING THE UTILIZATION OF LOCAL RESIDUES FOR ENERGY PRODUCTION: AN APPLICATION IN THE SILISTRA REGION, BULGARIA

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ABSTRACT

Developed agricultural regions generate substantial quantities of cellulose residues, which at present are only partially utilized. The remainder is destroyed, thereby damaging the environmental quality of the region, and leading to additional expenditures for environmental management.

The rise in primary energy prices has recently stimulated investigations of the feasibility of converting residues into secondary energy forms such as biogas and ethanol. This paper presents an application in the Silistra region, Bulgaria, of a model for utilizing local residues for energy production. The model, developed at IIASA, is designed to assist regional decision makers in their investigations of the effects on the regional energy balance of introducing new energy-conversion installations.

ACKNOWLEDGEMENTS

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MODELING THE UTILIZATION OF LOCAL RESIDUES FOR ENERGY PRODUCTION: AN APPLICATION IN THE SILISTRA REGION, BULGARIA

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1. THE PROBLEM

Regions with developed agricultural production, food-processing, and/or pulp and paper industries generate substantial quantities of cellulose residues. These include crop wastes,* animal wastes,† slaughterhouse wastes,‡ by-products from agriculturally based industries,§ and from the paper and pulp industry, as well as other celluslose by-products. At present, some of these residues are utilized as fertilizer, after a period of intermediate storage. The remainder is burned or destroyed by other means with the effect of polluting the environment. Thus, additional expenditures are required both for storage and environmental management.

One method of fully utilizing these residues, which also has the benefit of improving the regional energy balance, is to convert them, by means of anaerobic digestion, into biogas and sludge with a fertilizer value (Albegov and Balabanov 1980b). However, the overall implications of this technology should carefully be evaluated.

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*Thresh, crop stubble, straw, and spoiled fodder.

†Bedding, waste feed, poultry litter, and manure.

‡Blood, meat, leather, and wood wastes.

§Oil cakes, waste from fruit and vegetable processing, pressed mud from sugar refineries, sawdust, tobacco waste and seeds, and ligneous wastes.

The evaluation should include an examination of two groups of factors that can be seen to influence the decision to introduce an energy-conversion installation into the given region significantly. They comprise infrastructural facilities (for collection/distribution, transportation, and storage) and costs.

Infrastructural facilities are crucial to the siting of the energy-conversion installation, since residues have to be collected from farms, food-processing plants, etc. throughout the region and delivered to the digester. After the conversion process has taken place, distribution throughout the region is necessary. Distribution is obviously dependent on infrastructural facilities as much as on the product consumption pattern. Storage is also necessary for both sludge and biogas generated in the conversion process, although their requirements differ and they should therefore be treated separately.

Secondly, there is the question of costs. Costs relating to the operation and maintenance of the plant and to capital investment vary in accordance with the scale of biogas production. Additional costs would be incurred if nonconventional energy sources (e.g. solar heating) were used to accelerate the process of anaerobic digestion and also if the burners of existing devices were to require adjustment.

Given the nature of the two groups of factors influencing the decision, a systems analytical approach would seem an appropriate way to determine the overall implications of introducing this new energy-conversion technology. An evaluation based on this approach was carried out in an agricultural region in Bulgaria--the Silistra region. For this purpose, a linear programming model, taking into account all process costs, was constructed by Prof. M. Albegov and Dr T. Balabanov with the assistance of Dr A. Pitelin from the Central Economics and Mathematics Institute of the USSR Academy of Sciences (Albegov and Balabanov 1980a). The model was designed to assist the user in determining the optimal production and storage levels under a given set of constraints and supply and demand patterns. The implemented version of the model and the results of several initial runs are described in this paper.

The model's objective function is to maximize the substitution of biogas and fertilizer (produced from sludge) for conventional fuels (oil, gas, or coal) and fertilizers. The production system assumed is presented in Figure 1. Agricultural residues are treated as transportable or nontransportable (e.g. animal dung) and are distributed to several locations (Figure 2). For each of the locations 1-7, seasonal patterns for residue production and biogas and fertilizer consumption are assumed. It is also assumed that the production system could be located in locations 5, 6, or 7. The products (biogas and fertilizer sludge) could be transported to each of the locations 1-7. Several (up to 4) production capacities (for the digester) are considered in order to reflect different economies of scale.

2. FORMAL DESCRIPTION OF THE MODEL

2.1. Assumptions

1. It is possible to have several types of raw material at one point for digesters.
2. Biogas produced can be transported up to one kilometer without compression and up to 15-20 km with compression.
3. Fertilizers produced can be stored within the four-month periods under consideration (see section 2.3.1.). Additional storage capacity is required for certain periods of the year to balance supply and demand.
4. A linear combination of different raw materials leads to a linear combination of outputs (biogas and fertilizer).
5. The level of consumption of biogas and fertilizer is constrained according to the season.
6. Consumption outside the region under analysis is not directly considered but can be taken into account as an additional requirement at some border points of the region.
7. Biogas can be stored at the points of production.

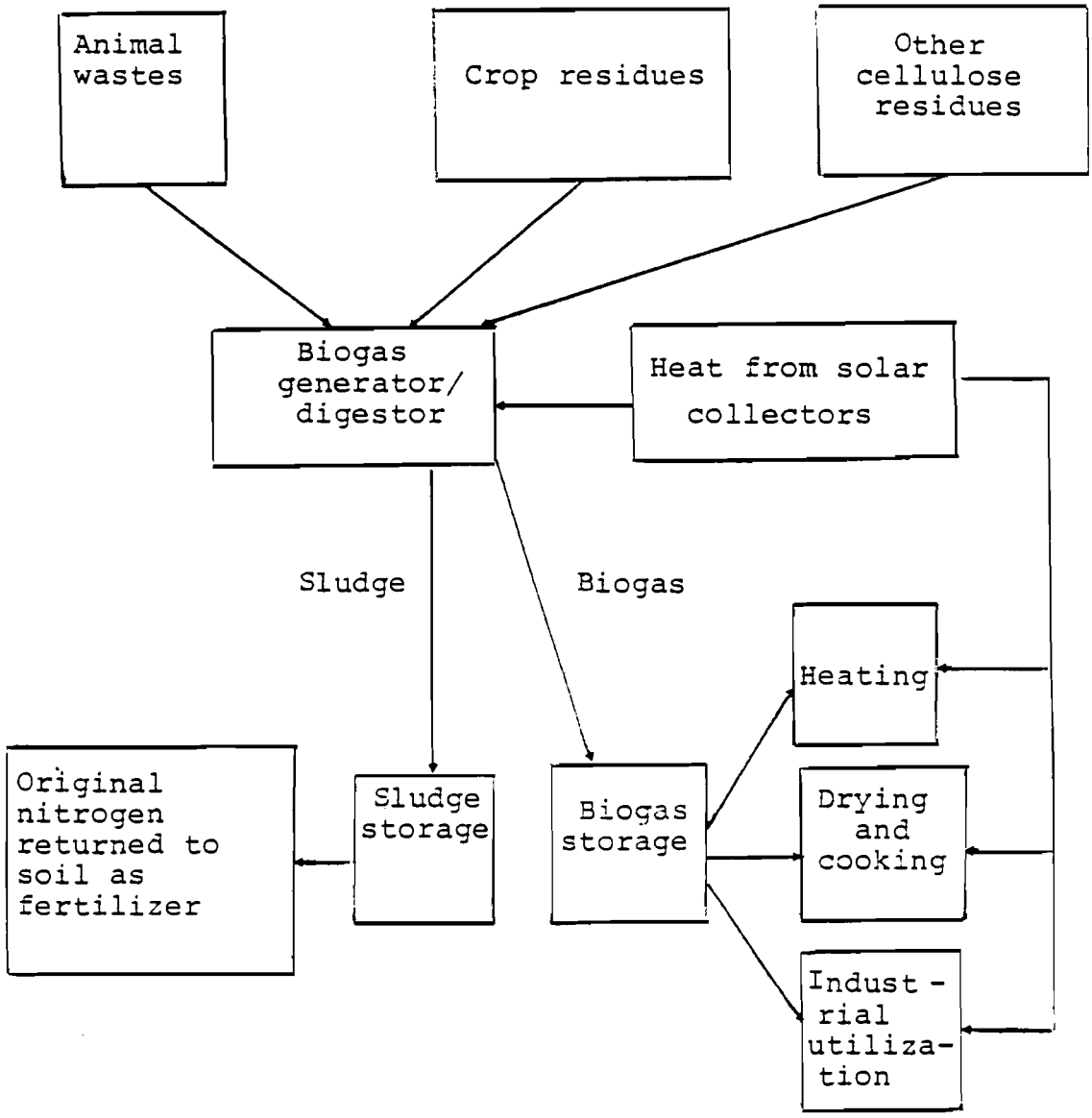
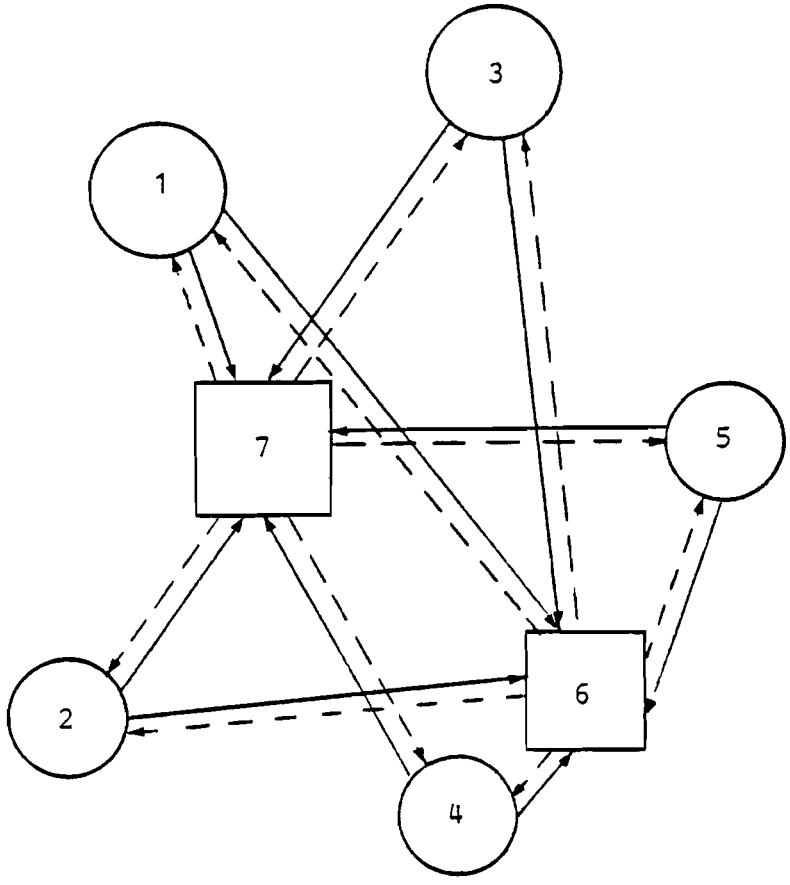


Figure 1. The production system under analysis.



1,2,3,...,7	points of residue concentration
6 and 7	possible digester locations, coinciding with the concentration of nontransportable residues
1-6; 1-7 2-6; 2-7 3-6; 3-7 4-6; 4-7 5-6; 5-7	transportation distances multiplied by the average specific transportation cost of raw materials (gas and fertilizers are delivered in the opposite direction, including corresponding costs)

Figure 2. Sample points of residue concentration and possible digester locations and their transportation links for the region under analysis.

2.2. Exogenous Information

1. Three sets of points are known: places where sources of raw materials are concentrated, possible sites for digester construction, and centers where the final products are consumed.
2. It is possible to determine the seasonal availability of raw materials and the volume of consumption of different products at corresponding points.
3. The seasonal consumption pattern for different products in every center is known.

2.3. Classification of Indices, Coefficients, and Variables

2.3.1. Indices

i = installation sites

n = technology type

o = type of outputs

p = points of resource and demand concentration

r = type of input available $r \in R_1 \cup R_2$

t = time period

where

i = 1,2,3

n = 1,...,4

o=1,2 = biogas and fertilizer, respectively

p = 1,...,7 (p=1,2,3 $\in P_1$ and corresponds to i = 1,2,3)

r=1 $\in R_1$ = nontransportable wastes

r=2,3,4 $\in R_2$ = transportable wastes

t=1,2,3 = period January-April, period May-August, period September-December, respectively

2.3.2. Coefficients

$CAP_{n,i}$ = installed capacity of technology type n at point i ($10^6 m^3$ biogas/yr)

$CF_{r,n}$ = conversion factor for resource r to unit of biogas ($10^3 t/10^6 m^3$) for installation n

$FP_{o,n}$ = fertilizer production (o=2) per unit of biogas production ($10^3 t/10^6 m^3$) for installation n

$INV_{n,i}$ = capital investment for construction of installation type n at point i (10^3 leva)

$EXC_{n,t}$ = operating and maintenance costs per installation n and time period t (10^3 lv/time period)

BEN = aggregated purchase price of the products

$BEN = PRE + CF_{r,n} \cdot PRF$

where

PRE = purchase price of conventional secondary energy ($lv/10^3 m^3$)

PRF = purchase price of 1 ton of fertilizer (lv/t)

$EXST_o$ = operation and maintenance cost of processing in/out of storage for o=1 biogas ($lv/10^3 m^3$), o=2 fertilizer (lv/t)

$INST_o$ = capital investment for construction of storage facilities

where

o=1 (INBGST) = for biogas ($lv/10^3 m^3$)

o=2 (INFTST) = for fertilizer (lv/t)

TR_o = cost of transportation

where

o=1 (TRBH) = for biogas ($lv/10^3 m^3/km$)

o=2 (TRR) = for fertilizer and residues (lv/t/km)

$TRDST_{i,p}$ = transportation distances between points i and p (km); from i to p it is assumed that the distance is 0.7 km

$PRSCR_{r,t,p}$ = production schedule of residue type r in time period t at point p (10^3t/time period)

$CSC_{t,o,p}$ = consumption schedule of output o in time period t at point p
where
o=1 ($CSCBC_{t,p}$) = for biogas ($10^6 m^3/t$)
o=2 ($CSCF_{t,p}$) = for fertilizer (10^3t/time period)

E = discount rate of capital investment; E = 0,...,12

All of the above coefficients are inputs to the model. The format of the input file is presented in Appendix A.

2.3.3. Variables

$tt_{n,i}$ = utilization of technology type n at point i

$tx_{n,t,i}$ = level of production for technology type n in time period t at point i

$ty_{t,i,r}$ = consumption of resource r in time period t at point i

$tz^{in}_{t,i,o}$, $tz^{st}_{t,i,o}$, $tz^{out}_{t,i,o}$ = quantities of product o <u>in</u>, <u>st</u>ored, and <u>out</u> of storage at point i in time period t

$t\hat{z}_{i,o}$ = required storage capacity for product o at point i

$fz_{t,i,r,p}$ = quantity of resource r to be transported from point p to point i during time period t

$fC_{t,i,o,p}$ = quantity of product o to be transported from production point i to consumption point p during time period t

2.3.4. The System of Equations

Utilization of the installed capacity

rows pi = 1,...,12

$$CAP_{n,i} \cdot tt_{n,i} - 3tx_{n,t,i} \geq 0, \text{ for all } t,n, \text{ and } i$$

rows pi = 1,...,13

$$\sum_{n} tt_{n,i} \leq 0, \text{ for all } i$$

Balance of the inputs

rows pi = 14,15,16

$$\sum_{n} tx_{n,i} - \sum_{r} ty_{t,i,r} \geq 0, \text{ for all } t \text{ and } i$$

Consumption of nontransportable resources

rows pi = 17,21,25

$$CF_{r,n} \cdot ty_{t,i,r} \leq PRSCR_{r,t,p}, \text{for } r \in R_1 \text{ and } i \equiv P \text{ and all } t$$

Consumption of transportable resources

rows p = 18,19,20,22,23,24,26,27,28

$$CF_{r,n} \cdot ty_{t,i,r} - \sum_{p} fz_{t,i,r,p} \geq 0, \text{ for } r \in R_2, \text{ all } p,t, \text{ and } i$$

rows r,...,irp

$$\sum_{i} fz_{t,i,r,p} \leq PRSCR_{r,t,p}, \text{ for all } p, r \in R_2 \text{ and } t$$

Production, storage, and consumption of the product

o=1 (biogas)

rows p = 28,...,31

$$\sum_{r} ty_{t,i,r} - tz^{out}_{t,i,o} + tz^{in}_{t,i,o} - \sum_{p} fC_{t,i,o,p} = 0, \text{ for all } t \text{ and } p$$

rows c,...,iop

$$\sum_{i} fC_{t,i,o,p} \leq CSCBG_{t,p}, \text{ for all } t \text{ and } p$$

Production, storage, and consumption of the product

o=2 (fertilizer)

rows p = 38,39,40

$$\sum_{r} FP_{o,n} \cdot ty_{t,i,r} - tz^{out}_{t,i,o} + tz^{in}_{t,i\ o} - \sum_{p} fC_{t,i,o,p} = 0, \quad \text{for all t and p}$$

rows c,...,iop

$$\sum_{i} fC_{t,i,o,p} \leq CSCF_{t,p}, \text{ for all t and p}$$

The seasonal variations in the storage of product o are simulated by

rows for o=1, p = 32,33,34

for o=2, p = 41,42,43

$$tz^{in}_{t,i,o} + tz^{st}_{t,i,o} - tz^{st}_{t+1,i,o} - tz^{out}_{t,i,o} = 0, \text{ for } t = 1,2$$

$$tz^{in}_{t,i,o} - tz^{st}_{t-2,i,o} + tz^{st}_{t,i,o} - tz^{out}_{t-2,i,o} = 0, \text{ for } t = 3$$

Storage Balance

rows for o=1, p = 35,36,37

for o=2, p = 44,45 46

$$tz^{st}_{t,i,o} - t\hat{z}_{i,o} \leq 0, \text{ for all o and i}$$

The objective is to maximize the profit from biogas and fertilizer sales.

$$\left[E^* \left(\sum_{n,i} INV_{n,i} \cdot tt_{n,i}\right) + \sum_{n,t,i} EXC_{n,t} \cdot tx_{n,t,i} - \right.$$

$$\sum_{t,i,r} BEN \cdot ty_{t,i,r} + \sum_{t,i,o} EXST_{o} \cdot tz^{in}_{t,i,o} +$$

$$\sum_{t,i,o} EXST_{o} \cdot tz^{out}_{t,i,o} + \sum_{i,o} INST_{o} \cdot t\hat{z}_{i,o} +$$

$$\sum_{t,i,r,p} (TR_{o} \cdot TRDST_{i,p}) \cdot fz_{t,i,r,p} +$$

$$\left. \sum_{t,i,o,p} (TR_{o} \cdot TRDST_{i,p}) \cdot fC_{t,i,o.p}\right] \Rightarrow \min$$

2.3.5. Structure of the Matrix for the Model

The matrix of the model was based on the system of equations described in section 2.3.4. Its structure for a location Pi(i = 1) without transportation links is shown in Figure 3.

The global matrix (Figure 4) is constructed from three matrices Pi(i = 1,2,3) with transportation links, resource and consumption constraints added. A matrix generation program was written (Appendix B) as input to a standard program for solving linear-programming problems (e.g. MINOS) in order to present the above structure in a MPSX format. The output of the program is presented in Appendix C.

3. DESCRIPTION OF THE MODEL APPLICATION IN THE SILISTRA REGION

The characteristics of the Silistra region are presented in detail in Balabanov (1981). The main characteristics represented in the model are given below.

For the Silistra region, seven points were taken as locations of residue concentration and product (biogas/fertilizer) consumption. Out of these seven points, three were chosen as locations for the digester. The existing transportation network was used to determine transportation distances and hence costs. The specific costs of transportation were assumed to be 0.1 lv/tkm .

At each point, four types of residue are generated: agricultural wastes and pig, poultry, and cattle manure. All of the residues except for cattle manure are transportable. Four production capacities were introduced; see Table 1 for consumption and operating costs. Since residue production varies according to the seasons, it is defined by three periods: January-April, May-August, September-December. The seasonal pattern of biogas and sludge consumption also varies significantly over the year (Table 2). The conversion coefficients CF(j) and FP(j) were based on the production of $10^3 m^3$ biogas (Figure 5).

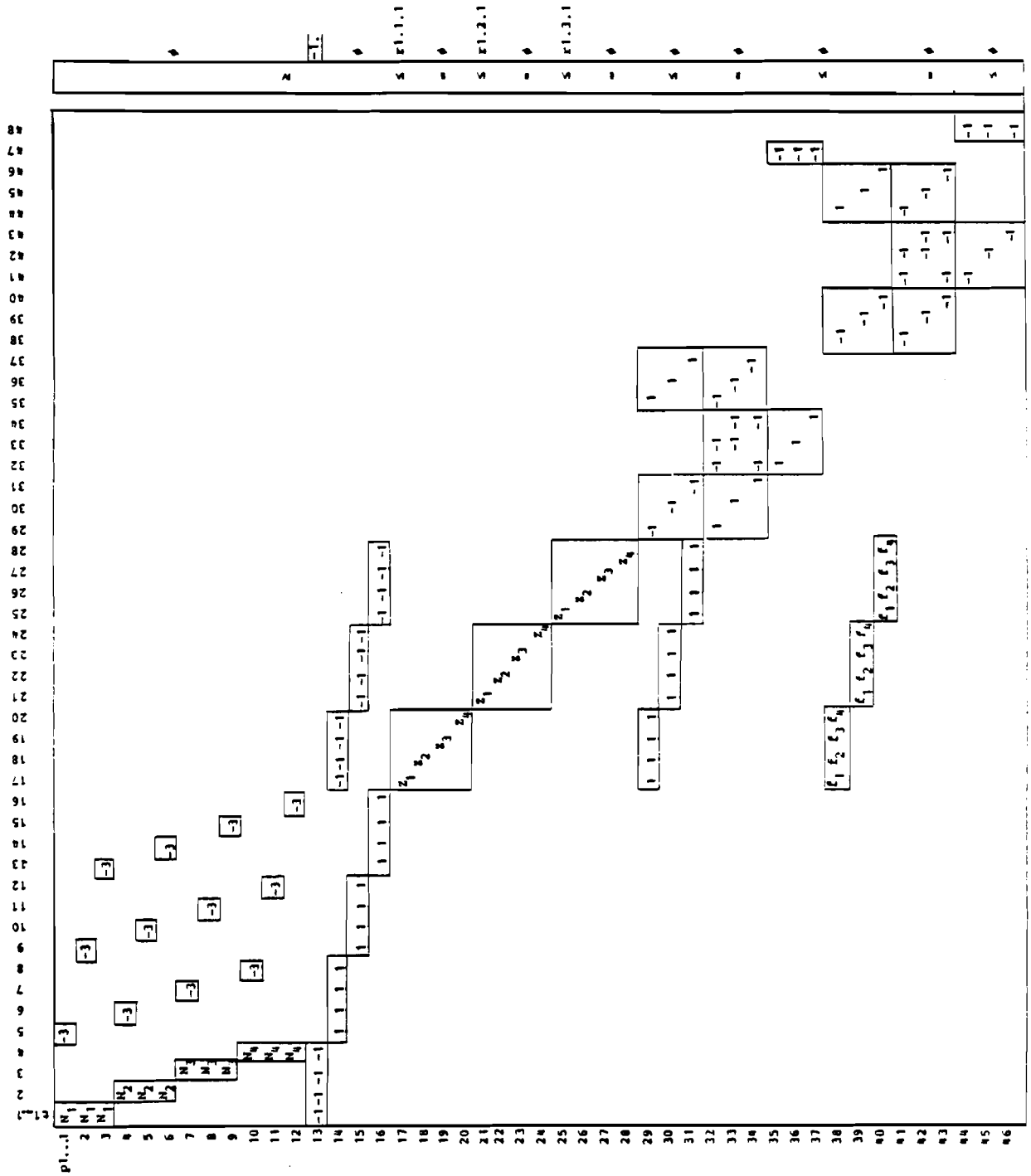


Figure 3. The matrix structure for point i = 1 without transportation links T1.

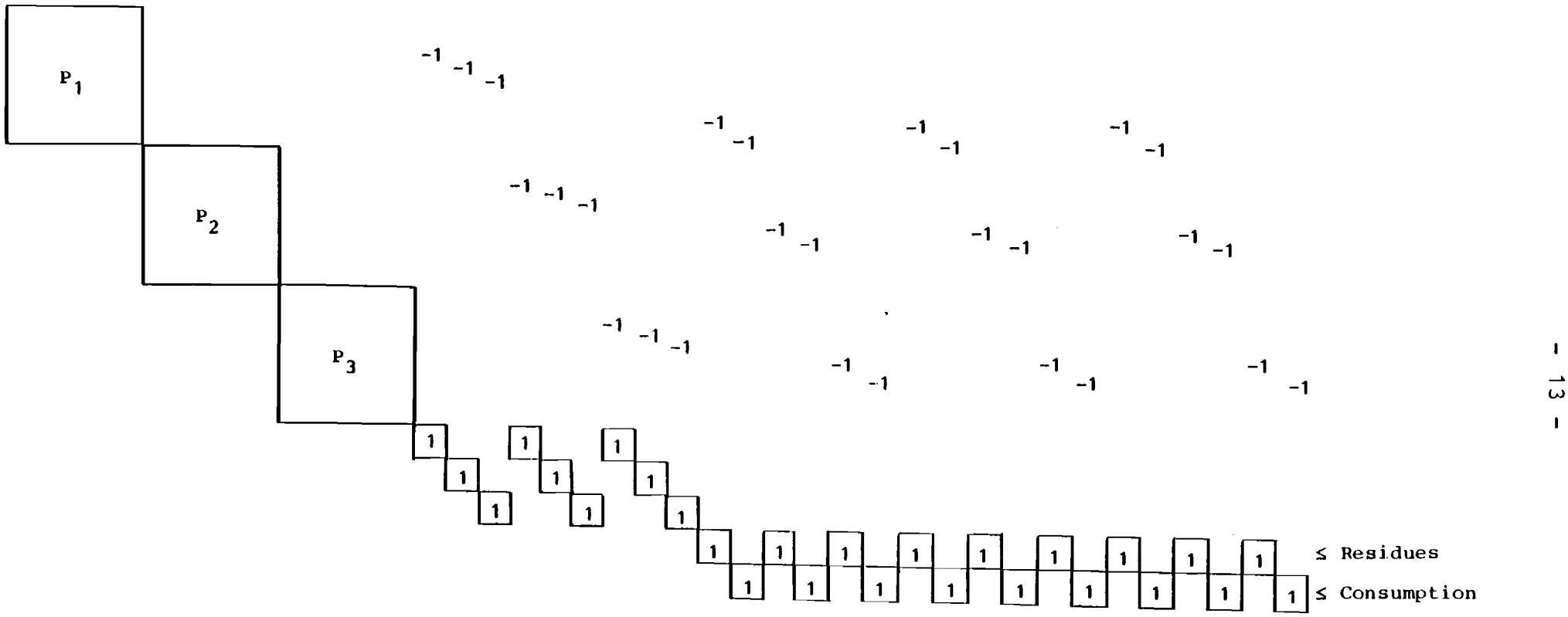


Figure 4. The structure of the model.

Table 1. Construction and operating costs.

Indices	Scale	Annual capacity of digester ($10^6 m^3$/yr)			
		100	50	25	12.5
Capital investment per unit of production	lv/m^3	0.0529	0.066	0.076	0.094
Total capital investments	10^6 lv	5.29	3.3	1.9	1.185
Operating and maintenance cost	10^6 lv/yr	6.3	5.4	3.6	3.6

Table 2. Seasonal variations in biogas and sludge consumption.

Location	Biogas (in $10^6 m^3$) Period			Fertilizer sludge (in $10^3 t$) Period		
	1	2	3	1	2	3
1	120.0	32.4	120.0	21.6	7.2	-
2	12.34	3.3	23.34	18.0	6.0	-
3	16.3	4.35	16.3	14.4	4.8	-
4	-	-	-	20.0	6.8	-
5	-	-	-	12.1	4.0	-
6	-	-	-	16.8	5.6	-
7	-	-	-	16.8	5.6	-

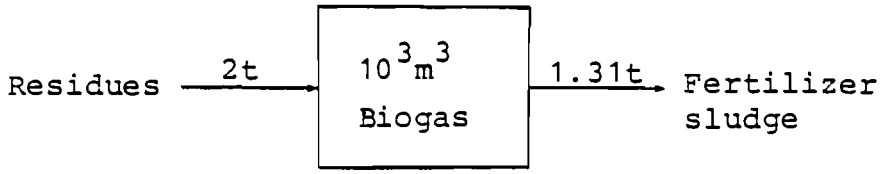


Figure 5. Sample balance of the digester.

Fuel and fertilizer prices influence the design of the digester and hence its level of efficiency. In order to reflect the level of fuel prices in Bulgaria, the price of substituted fuel chosen for the model is: 250 lv/t oil (or 111 lv/1,000m^3 biogas with a calorific value of 4,440 kcal/m^3). Subsidies for producing fertilizer sludge were estimated at 70 lv/t. All the inputs to the matrix generation program are presented in Appendix A.

4. ANALYSIS OF THE RESULTS

The solution of the problem described in section 3 (Table 3) showed that under the given resource availability, consumption pattern, and set of prices (Appendix A), the appropriate capacities to be built are:

Locations	1	2	3
Capacities ($10^6 m^3$/yr)	360	75.1	77.7

For location 1, biogas is produced only in time periods 1 and 3. The demand in time period 2 is not satisfied because of the high level of investment required for storage.

For location 2, biogas storage with a volume of 12.3 x $10^6 m^3$ enters the solution and the demands are satisfied for all three periods. The same occurs at location 3: biogas storage with a volume of 9.6 x $10^6 m^3$ enters the solution and demand is satisfied in time periods 1, 2, and 3. The raw materials from points 1, 4, 5, and 6 are transported to location 1 for processing. The demand for raw materials at the

Table 3. The results of the model runs.

			Location 1			Location 2			Location 3			Total supply for locations		
			Time period			Time period			Time period					
			1	2	3	1	2	3	1	2	3	1	2	3
Capacity ($10^6 m^3$/yr)				360.0			75.15			77.7				
Production of biogas		($10^6 m^3$/tp)	120.0		61.7	25.04		13.95	25.9		11.1			
Storage of biogas		($10^3 m^3$/tp)				-12.75	3.3	9.45	-9.6	4.4	5.2			
Distribution of biogas		($10^6 m^3$/tp)	120.0		61.7	12.3	3.3	23.4	16.3	4.4	16.3			
Consumption of non-transportable inputs		(10^3t/tp)	33.5		33.5	27.9		27.9	22.2		22.2			
Consumption of transportable inputs: from concentration to production points	1		41.6	41.6	41.6									
	4		30.7		31.7									
	5		18.6		18.6									
	6		26.1		26.1									
	2					21.0								
	3								27.9					
Total consumption of inputs (10^3t/tp)			192.1		151.5	48.9		27.9	50.1		22.2			
Production of fertilizers (10^3t/tp)			181.0	0	55.98				33.93		14.54			
Distribution of fertilizers (10^3t/tp): from production to consumption points	1		45.0	15.0								45.0	15.0	
	2		3.18			32.8	12.0					36.0	12.0	
	3								30.4	10.8		30.4	10.8	
	4		40.0	15.8								40.0	15.8	
	5		25.1	10.0								25.1	10.0	
	6		35.8	12.6								35.8	12.6	
	7		32.2	2.58			6.27		3.53	3.74		35.73	6.32	
Storage of fertilizers		(10^3t/tp)		55.98	-55.98		18.27	-18.27		14.54	-14.54			
Total distributed fertilizers (10^3t/tp)			181.0	55.98					33.93	14.54				

other two locations is satisfied by their own resources. In order to fulfill the demand for fertilizers, storage facilities are built at locations 1, 2, and 3 with volumes of 56 x 10^3t, 18.3 x 10^3t, 14.5 x 10^3t, respectively.

The fertilizers produced at locations 1, 2, and 3 are transported to the points of consumption, as presented in Table 3, in order to satisfy demand.

The solution shows that construction of the digesters is cost efficient: while the sum of discounted capital investment, operating, maintenance, and transportation costs does not exceed 1.9 x 10^6 lv/yr, the annual benefit is in the order of 2.2 x 10^6 lv.

APPENDIX A: INPUT FILE .

```
capacities CAP(i),i=1,4 [10*6 m*3 bio gas]
  100.00   50.00   25.00   12.50
convertion factors of residues CF(j)[10*3 ton/10*6 m*3 bio gas]
    2.00    2.73    2.22    1.89
fertilizer production/residue FP(j)[10*3 t/10*6 m**3 bio gas]
    1.31    1.31    1.31    1.31
investment for CAP(i)-INV(i)[10*3 leva/instalation]*E(0.12)
  634.30  396.00  228.00  142.20
O&M costs per four months per CAP(i)-EXC(i)[10*3 lv/per]
    2.4     1.8     1.2     1.1
benefit-BEN=( PRE[lv/10*3 m*3] + CF(j)[t/10*3 m*3]PRF[lv/t] )
 -203.0  -203.0  -203.0  -203.0
O&M cost for bio-gas proces.in/out of the stor.-STBG[lv/10*3 m*3]
    0.10
O&M cost for fertilizer proces.in/out of the stor.STF [lv/t]
    0.20
investment for bio gas storage-INBGST [lv/10*3 m*3]*E(0.12)
    9.80
investment for fertilizer storage-INFST [lv/t]*E(0.12)
    5.00
cost of transportation of bio gas-TRBG [lv/10*3 m*3.km]
    2.00
cost of transportation of residues-TRR[lv/t.km]
    0.10
transportation distances between the points-TRDST [km]
 point   1    2    3    4    5    6    7
   1    0.7 14.0 18.0 12.0 11.0  9.0 19.0
   2   14.0  0.7 13.0 21.0 20.0 12.0  8.2
   3   18.0 13.0  0.7 27.0 22.0 11.5 10.4
 production scedule of the residues-PPSCR [10*3 t/time period]
 point t=1   2   3   1   2   3   1   2   3    1    2    3
   1   33.5 0.0 33.5 0.6 0.6 0.6 0.5 0.5 0.5 41.6 41.6 41.6
   2   27.9 0.0 27.9 0.5 0.5 0.5 0.4 0.4 0.4 29.8 29.8 29.8
   3   22.2 0.0 22.2 0.4 0.4 0.4 0.3 0.3 0.3 37.5 37.5 37.5
   4    0.0 0.0  0.0 0.0 0.0 0.0 0.0 0.0 0.0 31.7  0.0 31.7
   5    0.0 0.0  0.0 0.0 0.0 0.0 0.0 0.0 0.0 18.6  0.0 18.6
   6    0.0 0.0  0.0 0.0 0.0 0.0 0.0 0.0 0.0 26.1  0.0 26.1
   7    0.0 0.0  0.0 0.0 0.0 0.0 0.0 0.0 0.0 26.1  0.0 26.1
```

consumption scedule for the bio gas-CSC3G [10*6 m*3/time period]

point	t=1	2	3
1	120.00	32.00	120.00
2	12.30	3.30	23.40
3	16.30	4.40	16.30
4	0.0	0.0	0.0
5	0.0	0.0	0.0
6	0.0	0.0	0.0
7	0.0	0.0	0.0

consumption scedule for the fertiliser-CSCF [10*3 t/time period]

point	t=1	2	3
1	21.60	7.20	0.0
2	18.00	6.00	0.0
3	14.40	4.80	0.0
4	20.00	6.80	0.0
5	12.10	4.00	0.0
6	16.80	5.60	0.0
7	16.80	5.60	0.0

APPENDIX B: MATRIX GENERATION PROGRAM.

```
c       matrix generator for the energy from residues model

        subroutine rinp1(inf)
        integer i
        real inf(4)
        read(1,95)(inf(i),i=1,4)
        write(6,95)(inf(i),i=1,4)
1       continue
95      format(/4f8.2)
        end

        subroutine rinp2(inf1)
        real inf1
        read(1,96)inf1
        write(6,96)inf1
96      format(/f8.2)
        end

        subroutine rinp3(inf3,im,jm)
        integer im,jm,k,i,j
        real inf3(jm,im)
        read(1,97)
        read(1,97)
        do 2 j=1,jm
        read(1,97)k,(inf3(j,i),i=1,im)
        write(6,97)k,(inf3(j,i),i=1,im)
2       continue
97      format(i2,3x,12f5.1)
        end

        subroutine rinp4(inf4)
        integer k,i,j
        real inf4(7,3)
        read(1,98)
        read(1,98)
        do 3 j=1,7
        read(1,93)k,(inf4(j,i),i=1,3)
        write(6,93)k,(inf4(j,i),i=1,3)
3       continue
98      format(i2,6x,3f8.2)
        end
```

```
c       main program
        integer i,k,t,r,p,o,l
        character*1 ne(3),rows(3),col(3),ii(3),ir(4),ip(7),it(3),ic(2)
        character*2 il(46),ic(46)
        real un,mun,mtr,stbg,stf,inbgst,infst
        real trbg,trr
        real cap(4),cf(4),fp(4),invc(4),exc(4),ben(4),trdst(3,7)
        real prscr(7,12),cscbg(7,3),cscf(7,3),ctrbg(3,7),ctrrs(3,7)
c       data
        un=1.0
        mun=-1.0
        mtr=-3.0
        data ne/'s','l','e'/
        data rows/'p','r','c'/
        data col/'t','f','u'/
        data ii/'1','2','3'/
        data ir/'1','2','3','4'/
        data ip/'1','2','3','4','5','6','7'/
        data it/'1','2','3'/
        data io/'1','2'/
        data il/'01','02','03','04','05','06','07','08','09','10','11'
     &  ,'12','13','14','15','16','17','18','19','20','21','22','23',
     &  '24','25','26','27','28','29','30','31','32','33','34','35',
     &  '36','37','38','39','40','41','42','43','44','45','46'/
        data ic/'01','02','03','04','05','06','07','08','09','10','11'
     &  ,'12','13','14','15','16','17','18','19','20','21','22','23',
     &  '24','25','26','27','28','29','30','31','32','33','34','35',
     &  '36','37','38','39','40','41','42','43','44','45','46','47',
     &  '48'/
c       file definition
        open(9,file='sil.mat')
        open(1,file='insil')
c
c       read the inputs
        call rinp1(cap)
        call rinp1(cf)
        call rinp1(fp)
        call rinp1(invc)
        call rinp1(exc)
        call rinp1(ben)
        call rinp2(stbg)
        call rinp2(stf)
        call rinp2(inbgst)
        call rinp2(infst)
        call rinp2(trbg)
        call rinp2(trr)
        call rinp3(trdst,7,3)
        call rinp3(prscr,12,7)
        call rinp4(cscbg)
        call rinp4(cscf)
c
c       form the matrix
        write(9,100)
c       rows
        write(9,200)
        write(9,250)
        do 6 i=1,3
        do 5 k=1,16
        if(k.eq.13)then
        write(9,255)ne(2),rows(1),ii(i),il(k)
        else
        write(9,255)ne(1),rows(1),ii(i),il(k)
        endif
```

```
  5       continue
          write(9,255)ne(2),rows(1),ii(i),il(17)
          do 7 k=18,20
          write(9,255)ne(3),rows(1),ii(i),il(k)
  7       continue
          write(9,255)ne(2),rows(1),ii(i),il(21)
          do 8 k=22,24
          write(9,255)ne(3),rows(1),ii(i),il(k)
  8       continue
          write(9,255)ne(2),rows(1),ii(i),il(25)
          do 10 k=26,28
          write(9,255)ne(3),rows(1),ii(i),il(k)
  10      continue
          do 11 k=29,34
          write(9,255)ne(3),rows(1),ii(i),il(k)
  11      continue
          do 12 k=35,37
          write(9,255)ne(2),rows(1),ii(i),il(k)
  12      continue
          do 13 k=38,43
          write(9,255)ne(3),rows(1),ii(i),il(k)
  13      continue
          do 14 k=44,46
          write(9,255)ne(2),rows(1),ii(i),il(k)
  14      continue
  6       continue
          do 15 t=1,3
          do 16 r=2,4
          do 17 p=1,7
          write(9,256)ne(2),rows(2),it(t),ir(r),ip(p)
  17      continue
  16      continue
          do 18 o=1,2
          do 19 p=1,7
          write(9,256)ne(2),rows(3),it(t),io(o),ip(p)
  19      continue
  18      continue
  15      continue

  c       form the columns
          write(9,300)
          do 20 i=1,3
          do 21 k=1,4
          write(9,350)col(1),ii(i),ic(k),invc(k)
          if(k.eq.1)then
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(1),cap(1),
         &  rows(1),ii(i),il(2),cap(1)
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(3),cap(1),
         &  rows(1),ii(i),il(13),-1.0
          else if(k.eq.2)then
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(4),cap(2),
         &  rows(1),ii(i),il(5),cap(2)
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(6),cap(2),
         &  rows(1),ii(i),il(13),-1.0
          else if(k.eq.3)then
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(7),cap(3),
         &  rows(1),ii(i),il(8),cap(3)
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(9),cap(3),
         &  rows(1),ii(i),il(13),-1.0
          else
          write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(10),cap(4),
         &  rows(1),ii(i),il(11),cap(4)
```

```
      write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(12),cap(4),
     & rows(1),ii(i),il(13),-1.0
      endif
21    continue
      do 23 k=5,16
      if(k.eq.5)then
      p=1
      r=14
      o=1
      else if(k.eq.6)then
      p=4
      r=14
      o=2
      else if(k.eq.7)then
      p=7
      r=14
      o=3
      else if(k.eq.8)then
      p=10
      r=14
      o=4
      else if(k.eq.9)then
      p=2
      r=15
      o=1
      else if(k.eq.10)then
      p=5
      r=15
      o=2
      else if(k.eq.11)then
      p=8
      r=15
      o=3
      else if(k.eq.12)then
      p=11
      r=15
      o=4
      else if(k.eq.13)then
      p=3
      r=16
      o=1
      else if(k.eq.14)then
      p=6
      r=16
      o=2
      else if(k.eq.15)then
      p=9
      r=16
      o=3
      else
      p=12
      r=16
      o=4
      endif
      write(9,350)col(1),ii(i),ic(k),exc(o)
      write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(p),-3.00,
     & rows(1),ii(i),il(r),1.00
23    continue
      do 26 k=17,28
      if(k.eq.17)then
      l=1
      r=14
```

```
            p=29
            o=33
            else if(k.eq.18)then
            l=2
            r=14
            p=29
            o=36
            else if(k.eq.19)then
            l=3
            r=14
            p=29
            o=38
            else if(k.eq.20)then
            l=4
            r=14
            p=29
            o=38
            else if(k.eq.21)then
            l=1
            r=15
            p=30
            o=39
            else if(k.eq.22)then
            l=2
            r=15
            p=30
            o=39
            else if(k.eq.23)then
            l=3
            r=15
            p=30
            o=39
            else if(k.eq.24)then
            l=4
            r=15
            p=30
            o=39
            else if(k.eq.25)then
            l=1
            r=16
            p=31
            o=40
            else if(k.eq.26)then
            l=2
            r=16
            p=31
            o=40
            else if(k.eq.27)then
            l=3
            r=16
            p=31
            o=40
            else
            l=4
            r=16
            p=31
            o=40
            endif
            write(9,350)col(1),ii(i),ic(k),ben(1)
            write(9,450)col(1),ii(i),ic(k),rows(1),ii(il),il(r),-1.0,
           &  rows(1),ii(i),il(k),cf(1)
            write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(p),1.0,
           &  rows(1),ii(i),il(o),fp(1)
```

```
 26     continue
        p=0
        do 29 k=29,31
        o=29+p
        l=32+p
        write(9,350)col(1),ii(i),ic(k),stbg
        write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(o),-1.0,
     &  rows(1),ii(i),il(l),1.0
        p=p+1
 29     continue
        write(9,450)col(1),ii(i),ic(32),rows(1),ii(i),il(32),1.0,
     &  rows(1),ii(i),il(34),-1.0
        write(9,400)col(1),ii(i),ic(32),rows(1),ii(i),il(35),1.0
        write(9,450)col(1),ii(i),ic(33),rows(1),ii(i),il(32),-1.0,
     &  rows(1),ii(i),il(35),1.0
        write(9,400)col(1),ii(i),ic(33),rows(1),ii(i),il(36),1.0
        write(9,450)col(1),ii(i),ic(34),rows(1),ii(i),il(33),-1.0,
     &  rows(1),ii(i),il(34),1.0
        write(9,400)col(1),ii(i),ic(34),rows(1),ii(i),il(37),1.0
        p=0
        do 30 k=35,37
        o=29+p
        l=32+p
        write(9,350)col(1),ii(i),ic(k),stbg
        write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(o),1.0,
     &  rows(1),ii(i),il(l),-1.0
        p=p+1
 30     continue
        p=0
        do 31 k=38,40
        o=38+p
        l=41+p
        write(9,350)col(1),ii(i),ic(k),stf
        write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(o),-1.0,
     &  rows(1),ii(i),il(l),1.0
        p=p+1
 31     continue
        write(9,450)col(1),ii(i),ic(41),rows(1),ii(i),il(41),1.0,
     &  rows(1),ii(i),il(43),-1.0
        write(9,400)col(1),ii(i),ic(41),rows(1),ii(i),il(44),1.0
        write(9,450)col(1),ii(i),ic(42),rows(1),ii(i),il(41),-1.0,
     &  rows(1),ii(i),il(42),1.0
        write(9,400)col(1),ii(i),ic(42),rows(1),ii(i),il(45),1.0
        write(9,450)col(1),ii(i),ic(43),rows(1),ii(i),il(42),-1.0,
     &  rows(1),ii(i),il(43),1.0
        write(9,400)col(1),ii(i),ic(43),rows(1),ii(i),il(46),1.0
        p=0
        do 32 k=44,46
        o=32+p
        l=41+p
        write(9,350)col(1),ii(i),ic(k),stf
        write(9,450)col(1),ii(i),ic(k),rows(1),ii(i),il(o),1.0,
     &  rows(1),ii(i),il(l),-1.0
        p=p+1
 32     continue
        write(9,350)col(1),ii(i),ic(47),inbgst
        write(9,450)col(1),ii(i),ic(47),rows(1),ii(i),il(35),-1.0,
     &  rows(1),ii(i),il(36),-1.0
        write(9,400)col(1),ii(i),ic(47),rows(1),ii(i),il(37),-1.0
        write(9,350)col(1),ii(i),ic(48),infst
        write(9,450)col(1),ii(i),ic(48),rows(1),ii(i),il(44),-1.0,
     &  rows(1),ii(i),il(45),-1.0
        write(9,400)col(1),ii(i),ic(48),rows(1),ii(i),il(46),-1.0
 20     continue
        do 33 i=1,3
        do 34 p=1,7
        ctrbg(i,p)=trdst(i,p)*trbg
        ctrrs(i,p)=trdst(i,p)*trr
```

```
74      continue
        write(6,98)(trdst(i,p),p=1,7)
        write(6,98)(ctrbg(i,p),p=1,7)
        write(6,98)(ctrrs(i,p),p=1,7)
33      continue
c       transportation part of the model
        do 35 t=1,3
        do 36 i=1,3
        do 37 r=2,4
        do 38 p=1,7
        write(9,355)col(2),it(t),ii(i),ir(r),ip(p),ctrrs(i,p)
        if(r.eq.2)then
        l=18
        else if(r.eq.3)then
        l=19
        else
        l=20
        endif
        write(9,550)col(2),it(t),ii(i),ir(r),ip(p),rows(1),ii(i),il(l)
     &  ,-1.00,rows(2),it(t),ir(r),ip(p),1.00
38      continue
37      continue
        do 39 o=1,2
        do 40 p=1,7
        if(o.eq.1)then
        write(9,355)col(3),it(t),ii(i),io(o),ip(o),ctrbg(i,p)
        if(t.eq.1)then
        write(9,550)col(3),it(t),ii(i),io(o),ip(o),rows(1),ii(i),
     &  il(29),-1.00,rows(3),it(t),io(o),ip(p),1.00
        else if(t.eq.2)then
        write(9,550)col(3),it(t),ii(i),io(o),ip(o),rows(1),ii(i),
     &  il(30),-1.00,rows(3),it(t),io(o),ip(p),1.00
        else
        write(9,550)col(3),it(t),ii(i),io(o),ip(o),rows(1),ii(i),
     &  il(31),-1.00,rows(3),it(t),io(o),ip(p),1.00
        endif
        else
        write(9,355)col(3),it(t),ii(i),io(o),ip(o),ctrrs(i,p)
        if(t.eq.1)then
        write(9,550)col(3),it(t),ii(i),io(o),ip(o),rows(1),ii(i),
     &  il(38),-1.00,rows(3),it(t),io(o),ip(p),1.00
        else if(t.eq.2)then
        write(9,550)col(3),it(t),ii(i),io(o),ip(o),rows(1),ii(i),
     &  il(39),-1.00,rows(3),it(t),io(o),ip(p),1.00
        else
        write(9,550)col(3),it(t),ii(i),io(o),ip(o),rows(1),ii(i),
     &  il(40),-1.00,rows(3),it(t),io(o),ip(p),1.00
        endif
        endif
40      continue
39      continue
36      continue
35      continue
c       write RHS
        write(9,600)
        do 41 i=1,3
        write(9,700)rows(1),ii(i),il(13),-1.00
        write(9,700)rows(1),ii(i),il(17),prscr(i,1)
        write(9,700)rows(1),ii(i),il(21),crscr(i,2)
        write(9,700)rows(1),ii(i),il(25),prscr(i,3)
```

```
 41       continue
          do 42 t=1,3
          do 43 r=2,4
          do 44 p=1,7
          if(r.eq.2)then
          l=t+3
          else if(r.eq.3)then
          l=t+6
          else
          l=t+9
          endif
          write(9,750)rows(2),it(t),ir(r),ip(p),orscr(p,l)
 44       continue
 43       continue
          do 45 q=1,2
          do 46 p=1,7
          if(q.eq.1)then
          write(9,750)rows(3),it(t),io(q),ip(p),cscbg(p,t)
          else
          write(9,750)rows(3),it(t),io(q),ip(p),cscf(p,t)
          endif
 46       continue
 45       continue
 42       continue
          write(9,950)
          stop
 c        formats to be used
 97       format(12f5.1)
 93       format(7f8.2)
 100      format(4hname,10x,5hobgsil)
 200      format(4nrows)
 250      format(12h n  obj..row)
 255      format(1h ,a1,2x,2a1,4h....,a2)
 256      format(1h ,a1,2x,a1,2h..,a1,1h.,a1,1h.,a1)
 300      format(7hcolumns)
 350      format(4x,2a1,4h....,a2,2x,5hobj..row,2x,f12.5,3x)
 355      format(4x,2a1,1h.,a1,1h.,a1,1h.,a1,2x,3hobj..row,2x,f12.5)
 400      format(4x,2a1,4h....,a2,2x,2a1,4h....,a2,2x,f12.5,3x)
 450      format(4x,2a1,4h....,a2,2x,2(2a1,4h....,a2,2x,f12.5,3x))
 500      format(4x,2a1,1h.,a1,1h.,a1,1h.,a1,2x,a1,2h..,a1,1h.,a1,1h.,
     &  a1,2x,f12.5,3x)
 550      format(4x,2a1,1h.,a1,1h.,a1,1h.,a1,2x,2a1,4h....,a2,2x,f12.5,
     &  3x,a1,2h..,a1,1h.,a1,1h.,a1,2x,f12.5)
 600      format(3hrhs)
 700      format(4x,3hrhs,3h...,'01',2x,2a1,4h....,a2,2x,f12.5)
 750      format(4x,3hrhs,3h...,'01',2x,a1,2h..,a1,1h.,a1,1h.,a1,
     &  2x,f12.5)
 800      format(6hbounds)
 900      format(x,a2,x,3hbnd...01,2x,f12.5)
 950      format(6hendata)
          end
```

APPENDIX C: RESULTS OF THE MATRIX GENERATION PROGRAM .

```
name          bgsil
rows
 n  obj..row
 g  p1....01
 g  p1....02
 g  p1....03
 g  p1....04
 g  p1....05
 g  p1....06
 g  p1....07
 g  p1....08
 g  p1....09
 g  p1....10
 g  p1....11
 g  p1....12
 l  p1....13
 g  p1....14
 g  p1....15
 g  p1....16
 l  p1....17
 e  p1....18
 e  p1....19
 e  p1....20
 l  p1....21
 e  p1....22
 e  p1....23
 e  p1....24
 l  p1....25
 e  p1....26
 e  p1....27
 e  p1....28
 e  p1....29
 e  p1....30
 e  p1....31
 e  p1....32
 e  p1....33
 e  p1....34
 l  p1....35
 l  p1....36
 l  p1....37
 e  p1....38
 e  p1....39
 e  p1....40
 e  p1....41
 e  p1....42
 e  p1....43
 l  p1....44
 l  p1....45
 l  p1....46
 g  p2....01
 g  p2....02
 g  p2....03
 g  p2....04
 g  p2....05
 g  p2....06
 g  p2....07
 g  p2....08
 g  p2....09
 g  p2....10
 g  p2....11
```

g p2....12
l p2....13
g p2....14
g p2....15
g p2....16
l p2....17
e p2....18
e p2....19
e p2....20
l p2....21
e p2....22
e p2....23
e p2....24
l p2....25
e p2....26
e p2....27
e p2....28
e p2....29
e p2....30
e p2....31
e p2....32
e p2....33
e p2....34
l p2....35
l p2....36
l p2....37
e p2....38
e p2....39
e p2....40
e p2....41
e p2....42
e p2....43
l p2....44
l p2....45
l p2....46
g p3....01
g p3....02
g p3....03
g p3....04
g p3....05
g p3....06
g p3....07
g p3....08
g p3....09
g p3....10
g p3....11
g p3....12
l p3....13
g p3....14
g p3....15
g p3....16
l p3....17
e p3....18
e p3....19
e p3....20
l p3....21
e p3....22
e p3....23
e p3....24
l p3....25

```
    e  p3....26
    e  p3....27
    e  p3....28
    e  p3....29
    e  p3....30
    e  p3....31
    e  p3....32
    e  p3....33
    e  p3....34
    1  p3....35
    1  p3....36
    1  p3....37
    e  p3....38
    e  p3....39
    e  p3....40
    e  p3....41
    e  p3....42
    e  p3....43
    1  p3....44
    1  p3....45
    1  p3....46
    1  r..1.2.1
    1  r..1.2.2
    1  r..1.2.3
    1  r..1.2.4
    1  r..1.2.5
    1  r..1.2.6
    1  r..1.2.7
    1  r..1.3.1
    1  r..1.3.2
    1  r..1.3.3
    1  r..1.3.4
    1  r..1.3.5
    1  r..1.3.6
    1  r..1.3.7
    1  r..1.4.1
    1  r..1.4.2
    1  r..1.4.3
    1  r..1.4.4
    1  r..1.4.5
    1  r..1.4.6
    1  r..1.4.7
    1  c..1.1.1
    1  c..1.1.2
    1  c..1.1.3
    1  c..1.1.4
    1  c..1.1.5
    1  c..1.1.6
    1  c..1.1.7
    1  c..1.2.1
    1  c..1.2.2
    1  c..1.2.3
    1  c..1.2.4
    1  c..1.2.5
    1  c..1.2.6
    1  c..1.2.7
    1  r..2.2.1
    1  r..2.2.2
    1  r..2.2.3
    1  r..2.2.4
```

```
1  r..2.2.5
1  r..2.2.6
1  r..2.2.7
1  r..2.3.1
1  r..2.3.2
1  r..2.3.3
1  r..2.3.4
1  r..2.3.5
1  r..2.3.6
1  r..2.3.7
1  r..2.4.1
1  r..2.4.2
1  r..2.4.3
1  r..2.4.4
1  r..2.4.5
1  r..2.4.6
1  r..2.4.7
1  c..2.1.1
1  c..2.1.2
1  c..2.1.3
1  c..2.1.4
1  c..2.1.5
1  c..2.1.6
1  c..2.1.7
1  c..2.2.1
1  c..2.2.2
1  c..2.2.3
1  c..2.2.4
1  c..2.2.5
1  c..2.2.6
1  c..2.2.7
1  r..3.2.1
1  r..3.2.2
1  r..3.2.3
1  r..3.2.4
1  r..3.2.5
1  r..3.2.6
1  r..3.2.7
1  r..3.3.1
1  r..3.3.2
1  r..3.3.3
1  r..3.3.4
1  r..3.3.5
1  r..3.3.6
1  r..3.3.7
1  r..3.4.1
1  r..3.4.2
1  r..3.4.3
1  r..3.4.4
1  r..3.4.5
1  r..3.4.6
1  r..3.4.7
1  c..3.1.1
1  c..3.1.2
1  c..3.1.3
1  c..3.1.4
1  c..3.1.5
1  c..3.1.6
1  c..3.1.7
1  c..3.2.1
```

```
    1  c..3.2.2
    1  c..3.2.3
    1  c..3.2.4
    1  c..3.2.5
    1  c..3.2.6
    1  c..3.2.7
  columns
       t1....01  obj..row      634.79999
       t1....01  p1....01      100.00000   p1....02      100.00000
       t1....01  p1....03      100.00000   p1....13       -1.00000
       t1....02  obj..row      396.00000
       t1....02  p1....04       50.00000   p1....05       50.00000
       t1....02  p1....06       50.00000   p1....13       -1.00000
       t1....03  obj..row      228.00000
       t1....03  p1....07       25.00000   p1....08       25.00000
       t1....03  p1....09       25.00000   p1....13       -1.00000
       t1....04  obj..row      142.20000
       t1....04  p1....10       12.50000   p1....11       12.50000
       t1....04  p1....12       12.50000   p1....13       -1.00000
       t1....05  obj..row        2.40000
       t1....05  p1....01       -3.00000   p1....14        1.00000
       t1....06  obj..row        1.80000
       t1....06  p1....04       -3.00000   p1....14        1.00000
       t1....07  obj..row        1.20000
       t1....07  p1....07       -3.00000   p1....14        1.00000
       t1....08  obj..row        1.10000
       t1....08  p1....10       -3.00000   p1....14        1.00000
       t1....09  obj..row        2.40000
       t1....09  p1....02       -3.00000   p1....15        1.00000
       t1....10  obj..row        1.80000
       t1....10  p1....05       -3.00000   p1....15        1.00000
       t1....11  obj..row        1.20000
       t1....11  p1....03       -3.00000   p1....15        1.00000
       t1....12  obj..row        1.10000
       t1....12  p1....11       -3.00000   p1....15        1.00000
       t1....13  obj..row        2.40000
       t1....13  p1....03       -3.00000   p1....16        1.00000
       t1....14  obj..row        1.80000
       t1....14  p1....06       -3.00000   p1....16        1.00000
       t1....15  obj..row        1.20000
       t1....15  p1....09       -3.00000   p1....16        1.00000
       t1....16  obj..row        1.10000
       t1....16  p1....12       -3.00000   p1....16        1.00000
       t1....17  obj..row     -203.00000
       t1....17  p1....14       -1.00000   p1....17        2.00000
       t1....17  p1....29        1.00000   p1....38        1.31000
       t1....18  obj..row     -203.00000
       t1....18  p1....14       -1.00000   p1....18        2.78000
       t1....18  p1....29        1.00000   p1....38        1.31000
       t1....19  obj..row     -203.00000
       t1....19  p1....14       -1.00000   p1....19        2.22000
       t1....19  p1....29        1.00000   p1....38        1.31000
       t1....20  obj..row     -203.00000
       t1....20  p1....14       -1.00000   p1....20        1.89000
       t1....20  p1....29        1.00000   p1....38        1.31000
       t1....21  obj..row     -203.00000
       t1....21  p1....15       -1.00000   p1....21        2.00000
       t1....21  p1....30        1.00000   p1....39        1.31000
       t1....22  obj..row     -203.00000
       t1....22  p1....15       -1.00000   p1....22        2.78000
```

```
    t1....22  p1....30       1.00000   p1....39       1.31000
    t1....23  obj..row    -203.00000
    t1....23  p1....15      -1.00000   p1....23       2.22000
    t1....23  p1....30       1.00000   p1....39       1.31000
    t1....24  obj..row    -203.00000
    t1....24  p1....15      -1.00000   p1....24       1.89000
    t1....24  p1....30       1.00000   p1....39       1.31000
    t1....25  obj..row    -203.00000
    t1....25  p1....16      -1.00000   p1....25       2.00000
    t1....25  p1....31       1.00000   p1....40       1.31000
    t1....26  obj..row    -203.00000
    t1....26  p1....16      -1.00000   p1....26       2.78000
    t1....26  p1....31       1.00000   p1....40       1.31000
    t1....27  obj..row    -203.00000
    t1....27  p1....16      -1.00000   p1....27       2.22000
    t1....27  p1....31       1.00000   p1....40       1.31000
    t1....28  obj..row    -203.00000
    t1....28  p1....16      -1.00000   p1....28       1.89000
    t1....28  p1....31       1.00000   p1....40       1.31000
    t1....29  obj..row       0.10000
    t1....29  p1....29      -1.00000   p1....32       1.00000
    t1....30  obj..row       0.10000
    t1....30  p1....30      -1.00000   p1....33       1.00000
    t1....31  obj..row       0.10000
    t1....31  p1....31      -1.00000   p1....34       1.00000
    t1....32  p1....32       1.00000   p1....34      -1.00000
    t1....32  p1....35       1.00000
    t1....33  p1....32      -1.00000   p1....33       1.00000
    t1....33  p1....36       1.00000
    t1....34  p1....33      -1.00000   p1....34       1.00000
    t1....34  p1....37       1.00000
    t1....35  obj..row       0.10000
    t1....35  p1....29       1.00000   p1....32      -1.00000
    t1....36  obj..row       0.10000
    t1....36  p1....30       1.00000   p1....33      -1.00000
    t1....37  obj..row       0.10000
    t1....37  p1....31       1.00000   p1....34      -1.00000
    t1....38  obj..row       0.20000
    t1....38  p1....33      -1.00000   p1....41       1.00000
    t1....39  obj..row       0.20000
    t1....39  p1....39      -1.00000   p1....42       1.00000
    t1....40  obj..row       0.20000
    t1....40  p1....40      -1.00000   p1....43       1.00000
    t1....41  p1....41       1.00000   p1....43      -1.00000
    t1....41  p1....44       1.00000
    t1....42  p1....41      -1.00000   p1....42       1.00000
    t1....42  p1....45       1.00000
    t1....43  p1....42      -1.00000   p1....43       1.00000
    t1....43  p1....46       1.00000
    t1....44  obj..row       0.20000
    t1....44  p1....38       1.00000   p1....41      -1.00000
    t1....45  obj..row       0.20000
    t1....45  p1....39       1.00000   p1....42      -1.00000
    t1....46  obj..row       0.20000
    t1....46  p1....40       1.00000   p1....43      -1.00000
    t1....47  obj..row       9.80000
    t1....47  p1....35      -1.00000   p1....36      -1.00000
    t1....47  p1....37      -1.00000
    t1....48  obj..row       5.00000
    t1....48  p1....44      -1.00000   p1....45      -1.00000
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    t1....48  p1....46      -1.00000
    t2....01  obj..row     634.79999
    t2....01  p2....01     100.00000   p2....02     100.00000
    t2....01  p2....03     100.00000   p2....13      -1.00000
    t2....02  obj..row     396.00000
    t2....02  p2....04      50.00000   p2....05      50.00000
    t2....02  p2....06      50.00000   p2....13      -1.00000
    t2....03  obj..row     228.00000
    t2....03  p2....07      25.00000   p2....08      25.00000
    t2....03  p2....09      25.00000   p2....13      -1.00000
    t2....04  obj..row     142.20000
    t2....04  p2....10      12.50000   p2....11      12.50000
    t2....04  p2....12      12.50000   p2....13      -1.00000
    t2....05  obj..row       2.40000
    t2....05  p2....01      -3.00000   p2....14       1.00000
    t2....06  obj..row       1.80000
    t2....06  p2....04      -3.00000   p2....14       1.00000
    t2....07  obj..row       1.20000
    t2....07  p2....07      -3.00000   p2....14       1.00000
    t2....08  obj..row       1.10000
    t2....08  p2....10      -3.00000   p2....14       1.00000
    t2....09  obj..row       2.40000
    t2....09  p2....02      -3.00000   p2....15       1.00000
    t2....10  obj..row       1.80000
    t2....10  p2....05      -3.00000   p2....15       1.00000
    t2....11  obj..row       1.20000
    t2....11  p2....08      -3.00000   p2....15       1.00000
    t2....12  obj..row       1.10000
    t2....12  p2....11      -3.00000   p2....15       1.00000
    t2....13  obj..row       2.40000
    t2....13  p2....03      -3.00000   p2....16       1.00000
    t2....14  obj..row       1.80000
    t2....14  p2....06      -3.00000   p2....16       1.00000
    t2....15  obj..row       1.20000
    t2....15  p2....09      -3.00000   p2....16       1.00000
    t2....16  obj..row       1.10000
    t2....16  p2....12      -3.00000   p2....16       1.00000
    t2....17  obj..row    -203.00000
    t2....17  p2....14      -1.00000   p2....17       2.00000
    t2....17  p2....29       1.00000   p2....38       1.31000
    t2....18  obj..row    -203.00000
    t2....18  p2....14      -1.00000   p2....18       2.78000
    t2....18  p2....29       1.00000   p2....38       1.31000
    t2....19  obj..row    -203.00000
    t2....19  p2....14      -1.00000   p2....19       2.22000
    t2....19  p2....29       1.00000   p2....38       1.31000
    t2....20  obj..row    -203.00000
    t2....20  p2....14      -1.00000   p2....20       1.89000
    t2....20  p2....29       1.00000   p2....38       1.31000
    t2....21  obj..row    -203.00000
    t2....21  p2....15      -1.00000   p2....21       2.00000
    t2....21  p2....30       1.00000   p2....39       1.31000
    t2....22  obj..row    -203.00000
    t2....22  p2....15      -1.00000   p2....22       2.78000
    t2....22  p2....30       1.00000   p2....39       1.31000
    t2....23  obj..row    -203.00000
    t2....23  p2....15      -1.00000   p2....23       2.22000
    t2....23  p2....30       1.00000   p2....39       1.31000
    t2....24  obj..row    -203.00000
    t2....24  p2....15      -1.00000   p2....24       1.89000
```

```
    t?....24  p2....30       1.00000    p2....39       1.31000
    t2....25  obj..row    -203.00000
    t2....25  p2....16      -1.00000    p2....25       2.00000
    t2....25  p2....31       1.00000    p2....40       1.31000
    t2....26  obj..row    -203.00000
    t2....26  p2....16      -1.00000    p2....26       2.78000
    t2....26  p2....31       1.00000    p2....40       1.31000
    t2....27  obj..row    -203.00000
    t2....27  p2....16      -1.00000    p2....27       2.22000
    t2....27  p2....31       1.00000    p2....40       1.31000
    t2....28  obj..row    -203.00000
    t2....28  p2....16      -1.00000    p2....28       1.39000
    t2....28  p2....31       1.00000    p2....40       1.31000
    t2....29  obj..row       0.10000
    t2....29  p2....29      -1.00000    p2....32       1.00000
    t2....30  obj..row       0.10000
    t2....30  p2....30      -1.00000    p2....33       1.00000
    t2....31  obj..row       0.10000
    t2....31  p2....31      -1.00000    p2....34       1.00000
    t2....32  p2....32       1.00000    p2....34      -1.00000
    t2....32  p2....35       1.00000
    t2....33  p2....32      -1.00000    p2....33       1.00000
    t2....33  p2....36       1.00000
    t2....34  p2....33      -1.00000    p2....34       1.00000
    t2....34  p2....37       1.00000
    t2....35  obj..row       0.10000
    t2....35  p2....29       1.00000    p2....32      -1.00000
    t2....36  obj..row       0.10000
    t2....36  p2....30       1.00000    p2....33      -1.00000
    t2....37  obj..row       0.10000
    t2....37  p2....31       1.00000    p2....34      -1.00000
    t2....38  obj..row       0.20000
    t2....38  p2....38      -1.00000    p2....41       1.00000
    t2....39  obj..row       0.20000
    t2....39  p2....39      -1.00000    p2....42       1.00000
    t2....40  obj..row       0.20000
    t2....40  p2....43      -1.00000    p2....43       1.00000
    t2....41  p2....41       1.00000    p2....43      -1.00000
    t2....41  p2....44       1.00000
    t2....42  p2....41      -1.00000    p2....42       1.00000
    t2....42  p2....45       1.00000
    t2....43  p2....42      -1.00000    p2....43       1.00000
    t2....43  p2....40       1.00000
    t2....44  obj..row       0.20000
    t2....44  p2....32       1.00000    p2....41      -1.00000
    t2....45  obj..row       0.20000
    t2....45  p2....39      -1.00000    p2....42      -1.00000
    t2....46  obj..row       0.20000
    t2....46  p2....40      -1.00000    p2....43      -1.00000
    t2....47  obj..row       9.80000
    t2....47  p2....35      -1.00000    p2....36      -1.00000
    t2....47  p2....37      -1.00000
    t2....48  obj..row      -5.00000
    t2....48  p2....44      -1.00000    p2....45      -1.00000
    t2....48  p2....46      -1.00000
    t3....01  obj..row     e34.79999
    t3....01  p3....01     100.00000    p3....02     100.00000
    t3....01  p3....03     100.00000    p3....13      -1.00000
    t3....02  obj..row     396.00000
    t3....02  p3....04      50.00000    p3....05      50.00000
```

t3....02	p3....06	50.00000	p3....13	-1.00000
t3....03	obj..row	229.00000		
t3....03	p3....07	25.00000	p3....08	25.00000
t3....03	p3....09	25.00000	p3....13	-1.00000
t3....04	obj..row	142.20000		
t3....04	p3....10	12.50000	p3....11	12.50000
t3....04	p3....12	12.50000	p3....13	-1.00000
t3....05	obj..row	2.40000		
t3....05	p3....01	-3.00000	p3....14	1.00000
t3....06	obj..row	1.80000		
t3....06	p3....04	-3.00000	p3....14	1.00000
t3....07	obj..row	1.20000		
t3....07	p3....07	-3.00000	p3....14	1.00000
t3....08	obj..row	1.10000		
t3....08	p3....10	-3.00000	p3....14	1.00000
t3....09	obj..row	2.40000		
t3....09	p3....02	-3.00000	p3....15	1.00000
t3....10	obj..row	1.80000		
t3....10	p3....05	-3.00000	p3....15	1.00000
t3....11	obj..row	1.20000		
t3....11	p3....08	-3.00000	p3....15	1.00000
t3....12	obj..row	1.10000		
t3....12	p3....11	-3.00000	p3....15	1.00000
t3....13	obj..row	2.40000		
t3....13	p3....03	-3.00000	p3....16	1.00000
t3....14	obj..row	1.80000		
t3....14	p3....0a	-3.00000	p3....16	1.00000
t3....15	obj..row	1.20000		
t3....15	p3....09	-3.00000	p3....16	1.00000
t3....16	obj..row	1.10000		
t3....16	p3....12	-3.00000	p3....16	1.00000
t3....17	obj..row	-203.00000		
t3....17	p3....14	-1.00000	p3....17	2.00000
t3....17	p3....29	1.00000	p3....38	1.31000
t3....18	obj..row	-203.00000		
t3....18	p3....14	-1.00000	p3....18	2.78000
t3....18	p3....29	1.00000	p3....38	1.31000
t3....19	obj..row	-203.00000		
t3....19	p3....14	-1.00000	p3....19	2.22000
t3....19	p3....29	1.00000	p3....38	1.31000
t3....20	obj..row	-203.00000		
t3....20	p3....14	-1.00000	p3....20	1.89000
t3....20	p3....29	1.00000	p3....38	1.31000
t3....21	obj..row	-203.00000		
t3....21	p3....15	-1.00000	p3....21	2.00000
t3....21	p3....30	1.00000	p3....39	1.31000
t3....22	obj..row	-203.00000		
t3....22	p3....15	-1.00000	p3....22	2.78000
t3....22	p3....30	1.00000	p3....39	1.31000
t3....23	obj..row	-203.00000		
t3....23	p3....15	-1.00000	p3....23	2.22000
t3....23	p3....30	1.00000	p3....39	1.31000
t3....24	obj..row	-203.00000		
t3....24	p3....15	-1.00000	p3....24	1.89000
t3....24	p3....30	1.00000	p3....39	1.31000
t3....25	obj..row	-203.00000		
t3....25	p3....16	-1.00000	p3....25	2.00000
t3....25	p3....31	1.00000	p3....40	1.31000
t3....26	obj..row	-203.00000		
t3....26	p3....16	-1.00000	p3....26	2.78000

```
    t3....26  p3....31      1.00000    p3....40      1.31000
    t3....27  obj..row   -203.00000
    t3....27  p3....16     -1.00000    p3....27      2.22000
    t3....27  p3....31      1.00000    p3....40      1.31000
    t3....28  obj..row   -203.00000
    t3....28  p3....16     -1.00000    p3....28      1.99000
    t3....28  p3....31      1.00000    p3....40      1.31000
    t3....29  obj..row      0.10000
    t3....29  p3....29     -1.00000    p3....32      1.00000
    t3....30  obj..row      0.10000
    t3....30  p3....30     -1.00000    p3....33      1.00000
    t3....31  obj..row      0.10000
    t3....31  p3....31     -1.00000    p3....34      1.00000
    t3....32  p3....32      1.00000    p3....34     -1.00000
    t3....32  p3....35      1.00000
    t3....33  p3....32     -1.00000    p3....33      1.00000
    t3....33  p3....36      1.00000
    t3....34  p3....33     -1.00000    p3....34      1.00000
    t3....34  p3....37      1.00000
    t3....35  obj..row      0.10000
    t3....35  p3....29      1.00000    p3....32     -1.00000
    t3....36  obj..row      0.10000
    t3....36  p3....30      1.00000    p3....33     -1.00000
    t3....37  obj..row      0.10000
    t3....37  p3....31      1.00000    p3....34     -1.00000
    t3....38  obj..row      0.20000
    t3....38  p3....38     -1.00000    p3....41      1.00000
    t3....39  obj..row      0.20000
    t3....39  p3....39     -1.00000    p3....42      1.00000
    t3....40  obj..row      0.20000
    t3....40  p3....40     -1.00000    p3....43      1.00000
    t3....41  p3....41      1.00000    p3....43     -1.00000
    t3....41  p3....44      1.00000
    t3....42  p3....41     -1.00000    p3....42      1.00000
    t3....42  p3....45      1.00000
    t3....43  p3....42     -1.00000    p3....43      1.00000
    t3....43  p3....46      1.00000
    t3....44  obj..row      0.20000
    t3....44  p3....33      1.00000    p3....41     -1.00000
    t3....45  obj..row      0.20000
    t3....45  p3....39      1.00000    p3....42     -1.00000
    t3....45  obj..row      0.20000
    t3....46  p3....40      1.00000    p3....43     -1.00000
    t3....47  obj..row      9.80000
    t3....47  p3....35     -1.00000    p3....36     -1.00000
    t3....47  p3....37     -1.00000
    t3....48  obj..row      5.00000
    t3....48  p3....44     -1.00000    p3....45     -1.00000
    t3....48  p3....46     -1.00000
    f1.1.2.1  obj..row      0.07000
    f1.1.2.1  p1....18     -1.00000    r..1.2.1      1.00000
    f1.1.2.2  obj..row      1.40000
    f1.1.2.2  p1....18     -1.00000    r..1.2.2      1.00000
    f1.1.2.3  obj..row      1.80000
    f1.1.2.3  p1....18     -1.00000    r..1.2.3      1.00000
    f1.1.2.4  obj..row      1.20000
    f1.1.2.4  p1....18     -1.00000    r..1.2.4      1.00000
    f1.1.2.5  obj..row      1.10000
    f1.1.2.5  p1....18     -1.00000    r..1.2.5      1.00000
    f1.1.2.6  obj..row      0.90000
```

f1.1.2.6	p1....18	-1.00000	r..1.2.6	1.00000
f1.1.2.7	obj..row	1.90000		
f1.1.2.7	p1....18	-1.00000	r..1.2.7	1.00000
f1.1.3.1	obj..row	0.07000		
f1.1.3.1	p1....19	-1.00000	r..1.3.1	1.00000
f1.1.3.2	obj..row	1.40000		
f1.1.3.2	p1....19	-1.00000	r..1.3.2	1.00000
f1.1.3.3	obj..row	1.80000		
f1.1.3.3	p1....19	-1.00000	r..1.3.3	1.00000
f1.1.3.4	obj..row	1.20000		
f1.1.3.4	p1....19	-1.00000	r..1.3.4	1.00000
f1.1.3.5	obj..row	1.10000		
f1.1.3.5	p1....19	-1.00000	r..1.3.5	1.00000
f1.1.3.6	obj..row	0.90000		
f1.1.3.6	p1....19	-1.00000	r..1.3.6	1.00000
f1.1.3.7	obj..row	1.90000		
f1.1.3.7	p1....19	-1.00000	r..1.3.7	1.00000
f1.1.4.1	obj..row	0.07000		
f1.1.4.1	p1....20	-1.00000	r..1.4.1	1.00000
f1.1.4.2	obj..row	1.43000		
f1.1.4.2	p1....20	-1.00000	r..1.4.2	1.00000
f1.1.4.3	obj..row	1.80000		
f1.1.4.3	p1....20	-1.00000	r..1.4.3	1.00000
f1.1.4.4	obj..row	1.20000		
f1.1.4.4	p1....20	-1.00000	r..1.4.4	1.00000
f1.1.4.5	obj..row	1.10000		
f1.1.4.5	p1....20	-1.00000	r..1.4.5	1.00000
f1.1.4.6	obj..row	0.90000		
f1.1.4.6	p1....20	-1.00000	r..1.4.6	1.00000
f1.1.4.7	obj..row	1.90000		
f1.1.4.7	p1....20	-1.00000	r..1.4.7	1.00000
u1.1.1.1	obj..row	1.40000		
u1.1.1.1	p1....29	-1.00000	c..1.1.1	1.00000
u1.1.1.2	obj..row	28.00000		
u1.1.1.2	p1....29	-1.00000	c..1.1.2	1.00000
u1.1.1.3	obj..row	36.00000		
u1.1.1.3	p1....29	-1.00000	c..1.1.3	1.00000
u1.1.1.4	obj..row	24.00000		
u1.1.1.4	p1....29	-1.00000	c..1.1.4	1.00000
u1.1.1.5	obj..row	22.00000		
u1.1.1.5	p1....29	-1.00000	c..1.1.5	1.00000
u1.1.1.6	obj..row	18.00000		
u1.1.1.6	p1....29	-1.00000	c..1.1.6	1.00000
u1.1.1.7	obj..row	38.00000		
u1.1.1.7	p1....29	-1.00000	c..1.1.7	1.00000
u1.1.2.1	obj..row	0.07000		
u1.1.2.1	p1....38	-1.00000	c..1.2.1	1.00000
u1.1.2.2	obj..row	1.40000		
u1.1.2.2	p1....38	-1.00000	c..1.2.2	1.00000
u1.1.2.3	obj..row	1.80000		
u1.1.2.3	p1....38	-1.00000	c..1.2.3	1.00000
u1.1.2.4	obj..row	1.20000		
u1.1.2.4	p1....38	-1.00000	c..1.2.4	1.00000
u1.1.2.5	obj..row	1.10000		
u1.1.2.5	p1....38	-1.00000	c..1.2.5	1.00000
u1.1.2.6	obj..row	0.90000		
u1.1.2.6	p1....38	-1.00000	c..1.2.6	1.00000
u1.1.2.7	obj..row	1.90000		
u1.1.2.7	p1....38	-1.00000	c..1.2.7	1.00000
f1.2.2.1	obj..row	1.40000		

f1.2.2.1	p2....18	-1.00000	r..1.2.1	1.00000
f1.2.2.2	obj..row	0.07000		
f1.2.2.2	p2....18	-1.00000	r..1.2.2	1.00000
f1.2.2.3	obj..row	1.30000		
f1.2.2.3	p2....18	-1.00000	r..1.2.3	1.00000
f1.2.2.4	obj..row	2.10000		
f1.2.2.4	p2....18	-1.00000	r..1.2.4	1.00000
f1.2.2.5	obj..row	2.00000		
f1.2.2.5	p2....18	-1.00000	r..1.2.5	1.00000
f1.2.2.6	obj..row	1.20000		
f1.2.2.6	p2....18	-1.00000	r..1.2.6	1.00000
f1.2.2.7	obj..row	0.82000		
f1.2.2.7	p2....18	-1.00000	r..1.2.7	1.00000
f1.2.3.1	obj..row	1.40000		
f1.2.3.1	p2....19	-1.00000	r..1.3.1	1.00000
f1.2.3.2	obj..row	0.07000		
f1.2.3.2	p2....19	-1.00000	r..1.3.2	1.00000
f1.2.3.3	obj..row	1.30000		
f1.2.3.3	p2....19	-1.00000	r..1.3.3	1.00000
f1.2.3.4	obj..row	2.10000		
f1.2.3.4	p2....19	-1.00000	r..1.3.4	1.00000
f1.2.3.5	obj..row	2.00000		
f1.2.3.5	p2....19	-1.00000	r..1.3.5	1.00000
f1.2.3.6	obj..row	1.20000		
f1.2.3.6	p2....19	-1.00000	r..1.3.6	1.00000
f1.2.3.7	obj..row	0.82000		
f1.2.3.7	p2....19	-1.00000	r..1.3.7	1.00000
f1.2.4.1	obj..row	1.40000		
f1.2.4.1	p2....20	-1.00000	r..1.4.1	1.00000
f1.2.4.2	obj..row	0.07000		
f1.2.4.2	p2....20	-1.00000	r..1.4.2	1.00000
f1.2.4.3	obj..row	1.30000		
f1.2.4.3	p2....20	-1.00000	r..1.4.3	1.00000
f1.2.4.4	obj..row	2.10000		
f1.2.4.4	p2....20	-1.00000	r..1.4.4	1.00000
f1.2.4.5	obj..row	2.00000		
f1.2.4.5	p2....20	-1.00000	r..1.4.5	1.00000
f1.2.4.6	obj..row	1.20000		
f1.2.4.6	p2....20	-1.00000	r..1.4.6	1.00000
f1.2.4.7	obj..row	0.82000		
f1.2.4.7	p2....20	-1.00000	r..1.4.7	1.00000
u1.2.1.1	obj..row	28.00000		
u1.2.1.1	p2....29	-1.00000	c..1.1.1	1.00000
u1.2.1.2	obj..row	1.40000		
u1.2.1.2	p2....29	-1.00000	c..1.1.2	1.00000
u1.2.1.3	obj..row	26.00000		
u1.2.1.3	p2....29	-1.00000	c..1.1.3	1.00000
u1.2.1.4	obj..row	42.00000		
u1.2.1.4	p2....29	-1.00000	c..1.1.4	1.00000
u1.2.1.5	obj..row	40.00000		
u1.2.1.5	p2....29	-1.00000	c..1.1.5	1.00000
u1.2.1.6	obj..row	24.00000		
u1.2.1.6	p2....29	-1.00000	c..1.1.6	1.00000
u1.2.1.7	obj..row	16.40000		
u1.2.1.7	p2....29	-1.00000	c..1.1.7	1.00000
u1.2.2.1	obj..row	1.40000		
u1.2.2.1	p2....38	-1.00000	c..1.2.1	1.00000
u1.2.2.2	obj..row	0.07000		
u1.2.2.2	p2....38	-1.00000	c..1.2.2	1.00000
u1.2.2.3	obj..row	1.30000		

```
    u1.2.2.3  p2....33      -1.00000   c..1.2.3      1.00000
    u1.2.2.4  obj..row       2.10000
    u1.2.2.4  p2....38      -1.00000   c..1.2.4      1.00000
    u1.2.2.5  obj..row       2.00000
    u1.2.2.5  p2....38      -1.00000   c..1.2.5      1.00000
    u1.2.2.6  obj..row       1.20000
    u1.2.2.6  p2....33      -1.00000   c..1.2.6      1.00000
    u1.2.2.7  obj..row       0.82000
    u1.2.2.7  p2....38      -1.00000   c..1.2.7      1.00000
    f1.3.2.1  obj..row       1.80000
    f1.3.2.1  p3....16      -1.00000   r..1.2.1      1.00000
    f1.3.2.2  obj..row       1.30000
    f1.3.2.2  p3....18      -1.00000   r..1.2.2      1.00000
    f1.3.2.3  obj..row       0.07000
    f1.3.2.3  p3....18      -1.00000   r..1.2.3      1.00000
    f1.3.2.4  obj..row       2.70000
    f1.3.2.4  p3....13      -1.00000   r..1.2.4      1.00000
    f1.3.2.5  obj..row       2.20000
    f1.3.2.5  p3....18      -1.00000   r..1.2.5      1.00000
    f1.3.2.6  obj..row       1.15000
    f1.3.2.6  p3....18      -1.00000   r..1.2.6      1.00000
    f1.3.2.7  obj..row       1.04000
    f1.3.2.7  p3....13      -1.00000   r..1.2.7      1.00000
    f1.3.3.1  obj..row       1.80000
    f1.3.3.1  p3....19      -1.00000   r..1.3.1      1.00000
    f1.3.3.2  obj..row       1.30000
    f1.3.3.2  p3....19      -1.00000   r..1.3.2      1.00000
    f1.3.3.3  obj..row       0.07000
    f1.3.3.3  p3....19      -1.00000   r..1.3.3      1.00000
    f1.3.3.4  obj..row       2.70000
    f1.3.3.4  p3....19      -1.00000   r..1.3.4      1.00000
    f1.3.3.5  obj..row       2.20000
    f1.3.3.5  p3....19      -1.00000   r..1.3.5      1.00000
    f1.3.3.6  obj..row       1.15000
    f1.3.3.6  p3....19      -1.00000   r..1.3.6      1.00000
    f1.3.3.7  obj..row       1.04000
    f1.3.3.7  p3....19      -1.00000   r..1.3.7      1.00000
    f1.3.4.1  obj..row       1.80000
    f1.3.4.1  p3....20      -1.00000   r..1.4.1      1.00000
    f1.3.4.2  obj..row       1.30000
    f1.3.4.2  p3....20      -1.00000   r..1.4.2      1.00000
    f1.3.4.3  obj..row       0.07000
    f1.3.4.3  p3....20      -1.00000   r..1.4.3      1.00000
    f1.3.4.4  obj..row       2.70000
    f1.3.4.4  p3....20      -1.00000   r..1.4.4      1.00000
    f1.3.4.5  obj..row       2.20000
    f1.3.4.5  p3....20      -1.00000   r..1.4.5      1.00000
    f1.3.4.6  obj..row       1.15000
    f1.3.4.6  p3....20      -1.00000   r..1.4.6      1.00000
    f1.3.4.7  obj..row       1.04000
    f1.3.4.7  p3....20      -1.00000   r..1.4.7      1.00000
    u1.3.1.1  obj..row      36.00000
    u1.3.1.1  p3....29      -1.00000   c..1.1.1      1.00000
    u1.3.1.2  obj..row      26.00000
    u1.3.1.2  p3....29      -1.00000   c..1.1.2      1.00000
    u1.3.1.3  obj..row       1.40000
    u1.3.1.3  p3....29      -1.00000   c..1.1.3      1.00000
    u1.3.1.4  obj..row      54.00000
    u1.3.1.4  p3....29      -1.00000   c..1.1.4      1.00000
    u1.3.1.5  obj..row      44.00000
```

u1.3.1.5	p3....29	-1.00000	c..1.1.5	1.00000
u1.3.1.6	obj..row	23.00000		
u1.3.1.6	p3....29	-1.00000	c..1.1.6	1.00000
u1.3.1.7	obj..row	20.30000		
u1.3.1.7	p3....29	-1.00000	c..1.1.7	1.00000
u1.3.2.1	obj..row	1.30000		
u1.3.2.1	p3....38	-1.00000	c..1.2.1	1.00000
u1.3.2.2	obj..row	1.30000		
u1.3.2.2	p3....38	-1.00000	c..1.2.2	1.00000
u1.3.2.3	obj..row	0.07000		
u1.3.2.3	p3....38	-1.00000	c..1.2.3	1.00000
u1.3.2.4	obj..row	2.70000		
u1.3.2.4	p3....38	-1.00000	c..1.2.4	1.00000
u1.3.2.5	obj..row	2.20000		
u1.3.2.5	p3....38	-1.00000	c..1.2.5	1.00000
u1.3.2.6	obj..row	1.15000		
u1.3.2.6	p3....38	-1.00000	c..1.2.6	1.00000
u1.3.2.7	obj..row	1.04000		
u1.3.2.7	p3....38	-1.00000	c..1.2.7	1.00000
f2.1.2.1	obj..row	0.07000		
f2.1.2.1	p1....18	-1.00000	r..2.2.1	1.00000
f2.1.2.2	obj..row	1.40000		
f2.1.2.2	p1....18	-1.00000	r..2.2.2	1.00000
f2.1.2.3	obj..row	1.80000		
f2.1.2.3	p1....18	-1.00000	r..2.2.3	1.00000
f2.1.2.4	obj..row	1.20000		
f2.1.2.4	p1....18	-1.00000	r..2.2.4	1.00000
f2.1.2.5	obj..row	1.10000		
f2.1.2.5	p1....18	-1.00000	r..2.2.5	1.00000
f2.1.2.6	obj..row	0.90000		
f2.1.2.6	p1....18	-1.00000	r..2.2.6	1.00000
f2.1.2.7	obj..row	1.90000		
f2.1.2.7	p1....18	-1.00000	r..2.2.7	1.00000
f2.1.3.1	obj..row	0.07000		
f2.1.3.1	p1....19	-1.00000	r..2.3.1	1.00000
f2.1.3.2	obj..row	1.40000		
f2.1.3.2	p1....19	-1.00000	r..2.3.2	1.00000
f2.1.3.3	obj..row	1.80000		
f2.1.3.3	p1....19	-1.00000	r..2.3.3	1.00000
f2.1.3.4	obj..row	1.20000		
f2.1.3.4	p1....19	-1.00000	r..2.3.4	1.00000
f2.1.3.5	obj..row	1.10000		
f2.1.3.5	p1....19	-1.00000	r..2.3.5	1.00000
f2.1.3.6	obj..row	0.90000		
f2.1.3.6	p1....19	-1.00000	r..2.3.6	1.00000
f2.1.3.7	obj..row	1.90000		
f2.1.3.7	p1....19	-1.00000	r..2.3.7	1.00000
f2.1.4.1	obj..row	0.07000		
f2.1.4.1	p1....20	-1.00000	r..2.4.1	1.00000
f2.1.4.2	obj..row	1.40000		
f2.1.4.2	p1....20	-1.00000	r..2.4.2	1.00000
f2.1.4.3	obj..row	1.80000		
f2.1.4.3	p1....20	-1.00000	r..2.4.3	1.00000
f2.1.4.4	obj..row	1.20000		
f2.1.4.4	p1....20	-1.00000	r..2.4.4	1.00000
f2.1.4.5	obj..row	1.10000		
f2.1.4.5	p1....20	-1.00000	r..2.4.5	1.00000
f2.1.4.6	obj..row	0.90000		
f2.1.4.6	p1....20	-1.00000	r..2.4.6	1.00000
f2.1.4.7	obj..row	1.90000		

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    f2.1.4.7  p1....20      -1.00000   r..2.4.7      1.00000
    u2.1.1.1  obj..row       1.40000
    u2.1.1.1  p1....30      -1.00000   c..2.1.1      1.00000
    u2.1.1.2  obj..row      28.00000
    u2.1.1.2  p1....30      -1.00000   c..2.1.2      1.00000
    u2.1.1.3  obj..row      36.00000
    u2.1.1.3  p1....30      -1.00000   c..2.1.3      1.00000
    u2.1.1.4  obj..row      24.00000
    u2.1.1.4  p1....30      -1.00000   c..2.1.4      1.00000
    u2.1.1.5  obj..row      22.00000
    u2.1.1.5  p1....30      -1.00000   c..2.1.5      1.00000
    u2.1.1.6  obj..row      18.00000
    u2.1.1.6  p1....30      -1.00000   c..2.1.6      1.00000
    u2.1.1.7  obj..row      38.00000
    u2.1.1.7  p1....30      -1.00000   c..2.1.7      1.00000
    u2.1.2.1  obj..row       0.07000
    u2.1.2.1  p1....39      -1.00000   c..2.2.1      1.00000
    u2.1.2.2  obj..row       1.40000
    u2.1.2.2  p1....39      -1.00000   c..2.2.2      1.00000
    u2.1.2.3  obj..row       1.80000
    u2.1.2.3  p1....39      -1.00000   c..2.2.3      1.00000
    u2.1.2.4  obj..row       1.20000
    u2.1.2.4  p1....39      -1.00000   c..2.2.4      1.00000
    u2.1.2.5  obj..row       1.10000
    u2.1.2.5  p1....39      -1.00000   c..2.2.5      1.00000
    u2.1.2.6  obj..row       0.90000
    u2.1.2.6  p1....39      -1.00000   c..2.2.6      1.00000
    u2.1.2.7  obj..row       1.90000
    u2.1.2.7  p1....39      -1.00000   c..2.2.7      1.00000
    f2.2.2.1  obj..row       1.40000
    f2.2.2.1  p2....18      -1.00000   r..2.2.1      1.00000
    f2.2.2.2  obj..row       0.07000
    f2.2.2.2  p2....18      -1.00000   r..2.2.2      1.00000
    f2.2.2.3  obj..row       1.30000
    f2.2.2.3  p2....18      -1.00000   r..2.2.3      1.00000
    f2.2.2.4  obj..row       2.10000
    f2.2.2.4  p2....18      -1.00000   r..2.2.4      1.00000
    f2.2.2.5  obj..row       2.00000
    f2.2.2.5  p2....18      -1.00000   r..2.2.5      1.00000
    f2.2.2.6  obj..row       1.20000
    f2.2.2.6  p2....18      -1.00000   r..2.2.6      1.00000
    f2.2.2.7  obj..row       0.82000
    f2.2.2.7  p2....18      -1.00000   r..2.2.7      1.00000
    f2.2.3.1  obj..row       1.40000
    f2.2.3.1  p2....19      -1.00000   r..2.3.1      1.00000
    f2.2.3.2  obj..row       0.07000
    f2.2.3.2  p2....19      -1.00000   r..2.3.2      1.00000
    f2.2.3.3  obj..row       1.30000
    f2.2.3.3  p2....19      -1.00000   r..2.3.3      1.00000
    f2.2.3.4  obj..row       2.10000
    f2.2.3.4  p2....19      -1.00000   r..2.3.4      1.00000
    f2.2.3.5  obj..row       2.00000
    f2.2.3.5  p2....19      -1.00000   r..2.3.5      1.00000
    f2.2.3.6  obj..row       1.20000
    f2.2.3.6  p2....19      -1.00000   r..2.3.6      1.00000
    f2.2.3.7  obj..row       0.82000
    f2.2.3.7  p2....19      -1.00000   r..2.3.7      1.00000
    f2.2.4.1  obj..row       1.40000
    f2.2.4.1  p2....20      -1.00000   r..2.4.1      1.00000
    f2.2.4.2  obj..row       0.07000
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f2.2.4.2	p2....20	-1.00000	r..2.4.2	1.00000
f2.2.4.3	obj..row	1.30000		
f2.2.4.3	p2....20	-1.00000	r..2.4.3	1.00000
f2.2.4.4	obj..row	2.10000		
f2.2.4.4	p2....20	-1.00000	r..2.4.4	1.00000
f2.2.4.5	obj..row	2.00000		
f2.2.4.5	p2....20	-1.00000	r..2.4.5	1.00000
f2.2.4.6	obj..row	1.20000		
f2.2.4.6	p2....20	-1.00000	r..2.4.6	1.00000
f2.2.4.7	obj..row	0.82000		
f2.2.4.7	p2....20	-1.00000	r..2.4.7	1.00000
u2.2.1.1	obj..row	28.00000		
u2.2.1.1	p2....30	-1.00000	c..2.1.1	1.00000
u2.2.1.2	obj..row	1.40000		
u2.2.1.2	p2....30	-1.00000	c..2.1.2	1.00000
u2.2.1.3	obj..row	26.00000		
u2.2.1.3	p2....30	-1.00000	c..2.1.3	1.00000
u2.2.1.4	obj..row	42.00000		
u2.2.1.4	p2....30	-1.00000	c..2.1.4	1.00000
u2.2.1.5	obj..row	40.00000		
u2.2.1.5	p2....30	-1.00000	c..2.1.5	1.00000
u2.2.1.6	obj..row	24.00000		
u2.2.1.6	p2....30	-1.00000	c..2.1.6	1.00000
u2.2.1.7	obj..row	16.40000		
u2.2.1.7	p2....30	-1.00000	c..2.1.7	1.00000
u2.2.2.1	obj..row	1.40000		
u2.2.2.1	p2....39	-1.00000	c..2.2.1	1.00000
u2.2.2.2	obj..row	0.07000		
u2.2.2.2	p2....39	-1.00000	c..2.2.2	1.00000
u2.2.2.3	obj..row	1.30000		
u2.2.2.3	p2....39	-1.00000	c..2.2.3	1.00000
u2.2.2.4	obj..row	2.10000		
u2.2.2.4	p2....39	-1.00000	c..2.2.4	1.00000
u2.2.2.5	obj..row	2.00000		
u2.2.2.5	p2....39	-1.00000	c..2.2.5	1.00000
u2.2.2.6	obj..row	1.20000		
u2.2.2.6	p2....39	-1.00000	c..2.2.6	1.00000
u2.2.2.7	obj..row	0.82000		
u2.2.2.7	p2....39	-1.00000	c..2.2.7	1.00000
f2.3.2.1	obj..row	1.30000		
f2.3.2.1	p3....18	-1.00000	r..2.2.1	1.00000
f2.3.2.2	obj..row	1.30000		
f2.3.2.2	p3....18	-1.00000	r..2.2.2	1.00000
f2.3.2.3	obj..row	0.07000		
f2.3.2.3	p3....18	-1.00000	r..2.2.3	1.00000
f2.3.2.4	obj..row	2.70000		
f2.3.2.4	p3....18	-1.00000	r..2.2.4	1.00000
f2.3.2.5	obj..row	2.20000		
f2.3.2.5	p3....18	-1.00000	r..2.2.5	1.00000
f2.3.2.6	obj..row	1.15000		
f2.3.2.6	p3....18	-1.00000	r..2.2.6	1.00000
f2.3.2.7	obj..row	1.04000		
f2.3.2.7	p3....18	-1.00000	r..2.2.7	1.00000
f2.3.3.1	obj..row	1.30000		
f2.3.3.1	p3....19	-1.00000	r..2.3.1	1.00000
f2.3.3.2	obj..row	1.30000		
f2.3.3.2	p3....19	-1.00000	r..2.3.2	1.00000
f2.3.3.3	obj..row	0.07000		
f2.3.3.3	p3....19	-1.00000	r..2.3.3	1.00000
f2.3.3.4	obj..row	2.70000		

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    f2.3.3.4  p3....19      -1.00000   r..2.3.4       1.00000
    f2.3.3.5  obj..row       2.20000
    f2.3.3.5  p3....19      -1.00000   r..2.3.5       1.00000
    f2.3.3.6  obj..row       1.15000
    f2.3.3.6  p3....19      -1.00000   r..2.3.6       1.00000
    f2.3.3.7  obj..row       1.04000
    f2.3.3.7  p3....19      -1.00000   r..2.3.7       1.00000
    f2.3.4.1  obj..row       1.80000
    f2.3.4.1  p3....20      -1.00000   r..2.4.1       1.00000
    f2.3.4.2  obj..row       1.30000
    f2.3.4.2  p3....20      -1.00000   r..2.4.2       1.00000
    f2.3.4.3  obj..row       0.07000
    f2.3.4.3  p3....20      -1.00000   r..2.4.3       1.00000
    f2.3.4.4  obj..row       2.70000
    f2.3.4.4  p3....20      -1.00000   r..2.4.4       1.00000
    f2.3.4.5  obj..row       2.20000
    f2.3.4.5  p3....20      -1.00000   r..2.4.5       1.00000
    f2.3.4.6  obj..row       1.15000
    f2.3.4.6  p3....20      -1.00000   r..2.4.6       1.00000
    f2.3.4.7  obj..row       1.04000
    f2.3.4.7  p3....20      -1.00000   r..2.4.7       1.00000
    u2.3.1.1  obj..row      36.00000
    u2.3.1.1  p3....30      -1.00000   c..2.1.1       1.00000
    u2.3.1.2  obj..row      26.00000
    u2.3.1.2  p3....30      -1.00000   c..2.1.2       1.00000
    u2.3.1.3  obj..row       1.40000
    u2.3.1.3  p3....30      -1.00000   c..2.1.3       1.00000
    u2.3.1.4  obj..row      54.00000
    u2.3.1.4  p3....30      -1.00000   c..2.1.4       1.00000
    u2.3.1.5  obj..row      44.00000
    u2.3.1.5  p3....30      -1.00000   c..2.1.5       1.00000
    u2.3.1.6  obj..row      23.00000
    u2.3.1.6  p3....30      -1.00000   c..2.1.6       1.00000
    u2.3.1.7  obj..row      30.00000
    u2.3.1.7  p3....30      -1.00000   c..2.1.7       1.00000
    u2.3.2.1  obj..row       1.80000
    u2.3.2.1  p3....39      -1.00000   c..2.2.1       1.00000
    u2.3.2.2  obj..row       1.30000
    u2.3.2.2  p3....39      -1.00000   c..2.2.2       1.00000
    u2.3.2.3  obj..row       0.07000
    u2.3.2.3  p3....39      -1.00000   c..2.2.3       1.00000
    u2.3.2.4  obj..row       2.70000
    u2.3.2.4  p3....39      -1.00000   c..2.2.4       1.00000
    u2.3.2.5  obj..row       2.20000
    u2.3.2.5  p3....39      -1.00000   c..2.2.5       1.00000
    u2.3.2.6  obj..row       1.15000
    u2.3.2.6  p3....39      -1.00000   c..2.2.6       1.00000
    u2.3.2.7  obj..row       1.04000
    u2.3.2.7  p3....39      -1.00000   c..2.2.7       1.00000
    f3.1.2.1  obj..row       0.07000
    f3.1.2.1  p1....18      -1.00000   r..3.2.1       1.00000
    f3.1.2.2  obj..row       1.40000
    f3.1.2.2  p1....18      -1.00000   r..3.2.2       1.00000
    f3.1.2.3  obj..row       1.80000
    f3.1.2.3  p1....18      -1.00000   r..3.2.3       1.00000
    f3.1.2.4  obj..row       1.20000
    f3.1.2.4  p1....18      -1.00000   r..3.2.4       1.00000
    f3.1.2.5  obj..row       1.10000
    f3.1.2.5  p1....18      -1.00000   r..3.2.5       1.00000
    f3.1.2.6  obj..row       0.90000
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```
    f3.1.2.6  p1....18      -1.00000    r..3.2.6      1.00000
    f3.1.2.7  obj..row       1.90000
    f3.1.2.7  p1....18      -1.00000    r..3.2.7      1.00000
    f3.1.3.1  obj..row       0.07000
    f3.1.3.1  p1....19      -1.00000    r..3.3.1      1.00000
    f3.1.3.2  obj..row       1.40000
    f3.1.3.2  p1....19      -1.00000    r..3.3.2      1.00000
    f3.1.3.3  obj..row       1.80000
    f3.1.3.3  p1....19      -1.00000    r..3.3.3      1.00000
    f3.1.3.4  obj..row       1.20000
    f3.1.3.4  p1....19      -1.00000    r..3.3.4      1.00000
    f3.1.3.5  obj..row       1.10000
    f3.1.3.5  p1....19      -1.00000    r..3.3.5      1.00000
    f3.1.3.6  obj..row       0.90000
    f3.1.3.6  p1....19      -1.00000    r..3.3.6      1.00000
    f3.1.3.7  obj..row       1.90000
    f3.1.3.7  p1....19      -1.00000    r..3.3.7      1.00000
    f3.1.4.1  obj..row       0.07000
    f3.1.4.1  p1....20      -1.00000    r..3.4.1      1.00000
    f3.1.4.2  obj..row       1.40000
    f3.1.4.2  p1....20      -1.00000    r..3.4.2      1.00000
    f3.1.4.3  obj..row       1.80000
    f3.1.4.3  p1....20      -1.00000    r..3.4.3      1.00000
    f3.1.4.4  obj..row       1.20000
    f3.1.4.4  p1....20      -1.00000    r..3.4.4      1.00000
    f3.1.4.5  obj..row       1.10000
    f3.1.4.5  p1....20      -1.00000    r..3.4.5      1.00000
    f3.1.4.6  obj..row       0.90000
    f3.1.4.6  p1....20      -1.00000    r..3.4.6      1.00000
    f3.1.4.7  obj..row       1.90000
    f3.1.4.7  p1....20      -1.00000    r..3.4.7      1.00000
    u3.1.1.1  obj..row       1.40000
    u3.1.1.1  p1....31      -1.00000    c..3.1.1      1.00000
    u3.1.1.2  obj..row      28.00000
    u3.1.1.2  p1....31      -1.00000    c..3.1.2      1.00000
    u3.1.1.3  obj..row      36.00000
    u3.1.1.3  p1....31      -1.00000    c..3.1.3      1.00000
    u3.1.1.4  obj..row      24.00000
    u3.1.1.4  p1....31      -1.00000    c..3.1.4      1.00000
    u3.1.1.5  obj..row      22.00000
    u3.1.1.5  p1....31      -1.00000    c..3.1.5      1.00000
    u3.1.1.6  obj..row      18.00000
    u3.1.1.6  p1....31      -1.00000    c..3.1.6      1.00000
    u3.1.1.7  obj..row      38.00000
    u3.1.1.7  p1....31      -1.00000    c..3.1.7      1.00000
    u3.1.2.1  obj..row       0.07000
    u3.1.2.1  p1....40      -1.00000    c..3.2.1      1.00000
    u3.1.2.2  obj..row       1.40000
    u3.1.2.2  p1....40      -1.00000    c..3.2.2      1.00000
    u3.1.2.3  obj..row       1.80000
    u3.1.2.3  p1....40      -1.00000    c..3.2.3      1.00000
    u3.1.2.4  obj..row       1.20000
    u3.1.2.4  p1....40      -1.00000    c..3.2.4      1.00000
    u3.1.2.5  obj..row       1.10000
    u3.1.2.5  p1....40      -1.00000    c..3.2.5      1.00000
    u3.1.2.6  obj..row       0.90000
    u3.1.2.6  p1....40      -1.00000    c..3.2.6      1.00000
    u3.1.2.7  obj..row       1.90000
    u3.1.2.7  p1....40      -1.00000    c..3.2.7      1.00000
    f3.2.2.1  obj..row       1.40000
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f3.2.2.1	p2....18	-1.00000	r..3.2.1	1.00000
f3.2.2.2	obj..row	0.97000		
f3.2.2.2	p2....18	-1.00000	r..3.2.2	1.00000
f3.2.2.3	obj..row	1.30000		
f3.2.2.3	p2....18	-1.00000	r..3.2.3	1.00000
f3.2.2.4	obj..row	2.10000		
f3.2.2.4	p2....18	-1.00000	r..3.2.4	1.00000
f3.2.2.5	obj..row	2.00000		
f3.2.2.5	p2....18	-1.00000	r..3.2.5	1.00000
f3.2.2.6	obj..row	1.20000		
f3.2.2.6	p2....18	-1.00000	r..3.2.6	1.00000
f3.2.2.7	obj..row	0.82000		
f3.2.2.7	p2....18	-1.00000	r..3.2.7	1.00000
f3.2.3.1	obj..row	1.40000		
f3.2.3.1	p2....19	-1.00000	r..3.3.1	1.00000
f3.2.3.2	obj..row	0.97000		
f3.2.3.2	p2....19	-1.00000	r..3.3.2	1.00000
f3.2.3.3	obj..row	1.30000		
f3.2.3.3	p2....19	-1.00000	r..3.3.3	1.00000
f3.2.3.4	obj..row	2.10000		
f3.2.3.4	p2....19	-1.00000	r..3.3.4	1.00000
f3.2.3.5	obj..row	2.00000		
f3.2.3.5	p2....19	-1.00000	r..3.3.5	1.00000
f3.2.3.6	obj..row	1.20000		
f3.2.3.6	p2....19	-1.00000	r..3.3.6	1.00000
f3.2.3.7	obj..row	0.82000		
f3.2.3.7	p2....19	-1.00000	r..3.3.7	1.00000
f3.2.4.1	obj..row	1.40000		
f3.2.4.1	p2....20	-1.00000	r..3.4.1	1.00000
f3.2.4.2	obj..row	0.97000		
f3.2.4.2	p2....20	-1.00000	r..3.4.2	1.00000
f3.2.4.3	obj..row	1.30000		
f3.2.4.3	p2....20	-1.00000	r..3.4.3	1.00000
f3.2.4.4	obj..row	2.10000		
f3.2.4.4	p2....20	-1.00000	r..3.4.4	1.00000
f3.2.4.5	obj..row	2.00000		
f3.2.4.5	p2....20	-1.00000	r..3.4.5	1.00000
f3.2.4.6	obj..row	1.20000		
f3.2.4.6	p2....20	-1.00000	r..3.4.6	1.00000
f3.2.4.7	obj..row	0.82000		
f3.2.4.7	p2....20	-1.00000	r..3.4.7	1.00000
u3.2.1.1	obj..row	28.00000		
u3.2.1.1	p2....31	-1.00000	c..3.1.1	1.00000
u3.2.1.2	obj..row	1.40000		
u3.2.1.2	p2....31	-1.00000	c..3.1.2	1.00000
u3.2.1.3	obj..row	26.00000		
u3.2.1.3	p2....31	-1.00000	c..3.1.3	1.00000
u3.2.1.4	obj..row	42.00000		
u3.2.1.4	p2....31	-1.00000	c..3.1.4	1.00000
u3.2.1.5	obj..row	40.00000		
u3.2.1.5	p2....31	-1.00000	c..3.1.5	1.00000
u3.2.1.6	obj..row	24.00000		
u3.2.1.6	p2....31	-1.00000	c..3.1.6	1.00000
u3.2.1.7	obj..row	16.40000		
u3.2.1.7	p2....31	-1.00000	c..3.1.7	1.00000
u3.2.2.1	obj..row	1.40000		
u3.2.2.1	p2....40	-1.00000	c..3.2.1	1.00000
u3.2.2.2	obj..row	0.97000		
u3.2.2.2	p2....40	-1.00000	c..3.2.2	1.00000
u3.2.2.3	obj..row	1.30000		

u3.2.2.3	p2....40	-1.00000	c..3.2.3	1.00000
u3.2.2.4	obj..row	2.10000		
u3.2.2.4	p2....40	-1.00000	c..3.2.4	1.00000
u3.2.2.5	obj..row	2.00000		
u3.2.2.5	p2....40	-1.00000	c..3.2.5	1.00000
u3.2.2.6	obj..row	1.20000		
u3.2.2.6	p2....40	-1.00000	c..3.2.6	1.00000
u3.2.2.7	obj..row	0.82000		
u3.2.2.7	p2....40	-1.00000	c..3.2.7	1.00000
f3.3.2.1	obj..row	1.60000		
f3.3.2.1	p3....18	-1.00000	r..3.2.1	1.00000
f3.3.2.2	obj..row	1.30000		
f3.3.2.2	p3....18	-1.00000	r..3.2.2	1.00000
f3.3.2.3	obj..row	0.97000		
f3.3.2.3	p3....18	-1.00000	r..3.2.3	1.00000
f3.3.2.4	obj..row	2.70000		
f3.3.2.4	p3....18	-1.00000	r..3.2.4	1.00000
f3.3.2.5	obj..row	2.20000		
f3.3.2.5	p3....18	-1.00000	r..3.2.5	1.00000
f3.3.2.6	obj..row	1.15000		
f3.3.2.6	p3....18	-1.00000	r..3.2.6	1.00000
f3.3.2.7	obj..row	1.04000		
f3.3.2.7	p3....18	-1.00000	r..3.2.7	1.00000
f3.3.3.1	obj..row	1.80000		
f3.3.3.1	p3....19	-1.00000	r..3.3.1	1.00000
f3.3.3.2	obj..row	1.30000		
f3.3.3.2	p3....19	-1.00000	r..3.3.2	1.00000
f3.3.3.3	obj..row	0.97000		
f3.3.3.3	p3....19	-1.00000	r..3.3.3	1.00000
f3.3.3.4	obj..row	2.70000		
f3.3.3.4	p3....19	-1.00000	r..3.3.4	1.00000
f3.3.3.5	obj..row	2.20000		
f3.3.3.5	p3....19	-1.00000	r..3.3.5	1.00000
f3.3.3.6	obj..row	1.15000		
f3.3.3.6	p3....19	-1.00000	r..3.3.6	1.00000
f3.3.3.7	obj..row	1.04000		
f3.3.3.7	p3....19	-1.00000	r..3.3.7	1.00000
f3.3.4.1	obj..row	1.80000		
f3.3.4.1	p3....20	-1.00000	r..3.4.1	1.00000
f3.3.4.2	obj..row	1.30000		
f3.3.4.2	p3....20	-1.00000	r..3.4.2	1.00000
f3.3.4.3	obj..row	0.97000		
f3.3.4.3	p3....20	-1.00000	r..3.4.3	1.00000
f3.3.4.4	obj..row	2.70000		
f3.3.4.4	p3....20	-1.00000	r..3.4.4	1.00000
f3.3.4.5	obj..row	2.20000		
f3.3.4.5	p3....20	-1.00000	r..3.4.5	1.00000
f3.3.4.6	obj..row	1.15000		
f3.3.4.6	p3....20	-1.00000	r..3.4.6	1.00000
f3.3.4.7	obj..row	1.04000		
f3.3.4.7	p3....20	-1.00000	r..3.4.7	1.00000
u3.3.1.1	obj..row	36.00000		
u3.3.1.1	p3....31	-1.00000	c..3.1.1	1.00000
u3.3.1.2	obj..row	26.00000		
u3.3.1.2	p3....31	-1.00000	c..3.1.2	1.00000
u3.3.1.3	obj..row	1.40000		
u3.3.1.3	p3....31	-1.00000	c..3.1.3	1.00000
u3.3.1.4	obj..row	54.00000		
u3.3.1.4	p3....31	-1.00000	c..3.1.4	1.00000
u3.3.1.5	obj..row	44.00000		

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    u3.3.1.5  p3....31      -1.00000   c..3.1.5       1.00000
    u3.3.1.6  obj..row      23.00000
    u3.3.1.6  p3....31      -1.00000   c..3.1.6       1.00000
    u3.3.1.7  obj..row      20.80000
    u3.3.1.7  p3....31      -1.00000   c..3.1.7       1.00000
    u3.3.2.1  obj..row       1.80000
    u3.3.2.1  p3....40      -1.00000   c..3.2.1       1.00000
    u3.3.2.2  obj..row       1.30000
    u3.3.2.2  p3....40      -1.00000   c..3.2.2       1.00000
    u3.3.2.3  obj..row       0.07000
    u3.3.2.3  p3....40      -1.00000   c..3.2.3       1.00000
    u3.3.2.4  obj..row       2.70000
    u3.3.2.4  p3....40      -1.00000   c..3.2.4       1.00000
    u3.3.2.5  obj..row       2.20000
    u3.3.2.5  p3....40      -1.00000   c..3.2.5       1.00000
    u3.3.2.6  obj..row       1.15000
    u3.3.2.6  p3....40      -1.00000   c..3.2.6       1.00000
    u3.3.2.7  obj..row       1.34000
    u3.3.2.7  p3....40      -1.00000   c..3.2.7       1.00000
rhs
    rhs...01  p1....13      -1.00000
    rhs...01  p1....17      33.50000
    rhs...01  p1....21       0.
    rhs...01  p1....25      33.50000
    rhs...01  p2....13      -1.00000
    rhs...01  p2....17      27.90000
    rhs...01  p2....21       0.
    rhs...01  p2....25      27.90000
    rhs...01  p3....13      -1.00000
    rhs...01  p3....17      22.20000
    rhs...01  p3....21       0.
    rhs...01  p3....25      22.20000
    rhs...01  r..1.2.1       0.60000
    rhs...01  r..1.2.2       0.50000
    rhs...01  r..1.2.3       0.40000
    rhs...01  r..1.2.4       0.
    rhs...01  r..1.2.5       0.
    rhs...01  r..1.2.6       0.
    rhs...01  r..1.2.7       0.
    rhs...01  r..1.3.1       0.50000
    rhs...01  r..1.3.2       0.40000
    rhs...01  r..1.3.3       0.30000
    rhs...01  r..1.3.4       0.
    rhs...01  r..1.3.5       0.
    rhs...01  r..1.3.6       0.
    rhs...01  r..1.3.7       0.
    rhs...01  r..1.4.1      41.60000
    rhs...01  r..1.4.2      29.80000
    rhs...01  r..1.4.3      37.50000
    rhs...01  r..1.4.4      31.70000
    rhs...01  r..1.4.5      18.60000
    rhs...01  r..1.4.6      26.10000
    rhs...01  r..1.4.7      26.10000
    rhs...01  c..1.1.1     120.00000
    rhs...01  c..1.1.2      12.30000
    rhs...01  c..1.1.3      16.30000
    rhs...01  c..1.1.4       0.
    rhs...01  c..1.1.5       0.
    rhs...01  c..1.1.6       0.
    rhs...01  c..1.1.7       0.
```

```
        rhs...01   c..1.2.1        21.60000
        rhs...01   c..1.2.2        13.00000
        rhs...01   c..1.2.3        14.40000
        rhs...01   c..1.2.4        20.00000
        rhs...01   c..1.2.5        12.10000
        rhs...01   c..1.2.6        16.80000
        rhs...01   c..1.2.7        16.80000
        rhs...01   r..2.2.1         0.60000
        rhs...01   r..2.2.2         0.50000
        rhs...01   r..2.2.3         0.40000
        rhs...01   r..2.2.4         0.
        rhs...01   r..2.2.5         0.
        rhs...01   r..2.2.6         0.
        rhs...01   r..2.2.7         0.
        rhs...01   r..2.3.1         0.50000
        rhs...01   r..2.3.2         0.40000
        rhs...01   r..2.3.3         0.30000
        rhs...01   r..2.3.4         0.
        rhs...01   r..2.3.5         0.
        rhs...01   r..2.3.6         0.
        rhs...01   r..2.3.7         0.
        rhs...01   r..2.4.1        41.60000
        rhs...01   r..2.4.2        29.80000
        rhs...01   r..2.4.3        37.50000
        rhs...01   r..2.4.4         0.
        rhs...01   r..2.4.5         0.
        rhs...01   r..2.4.6         0.
        rhs...01   r..2.4.7         0.
        rhs...01   c..2.1.1        32.00000
        rhs...01   c..2.1.2         3.30000
        rhs...01   c..2.1.3         4.40000
        rhs...01   c..2.1.4         0.
        rhs...01   c..2.1.5         0.
        rhs...01   c..2.1.6         0.
        rhs...01   c..2.1.7         0.
        rhs...01   c..2.2.1         7.20000
        rhs...01   c..2.2.2         6.00000
        rhs...01   c..2.2.3         4.80000
        rhs...01   c..2.2.4         6.80000
        rhs...01   c..2.2.5         4.00000
        rhs...01   c..2.2.6         5.60000
        rhs...01   c..2.2.7         5.60000
        rhs...01   r..3.2.1         0.60000
        rhs...01   r..3.2.2         0.50000
        rhs...01   r..3.2.3         0.40000
        rhs...01   r..3.2.4         0.
        rhs...01   r..3.2.5         0.
        rhs...01   r..3.2.6         0.
        rhs...01   r..3.2.7         0.
        rhs...01   r..3.3.1         0.50000
        rhs...01   r..3.3.2         0.40000
        rhs...01   r..3.3.3         0.30000
        rhs...01   r..3.3.4         0.
        rhs...01   r..3.3.5         0.
        rhs...01   r..3.3.6         0.
        rhs...01   r..3.3.7         0.
        rhs...01   r..3.4.1        41.60000
        rhs...01   r..3.4.2        29.30000
        rhs...01   r..3.4.3        37.50000
        rhs...01   r..3.4.4        31.70000
```

```
    rhs...01  r..3.4.5       18.60000
    rhs...01  r..3.4.6       26.10000
    rhs...01  r..3.4.7       20.10000
    rhs...01  c..3.1.1      120.00000
    rhs...01  c..3.1.2       23.40000
    rhs...01  c..3.1.3       16.30000
    rhs...01  c..3.1.4           0.
    rhs...01  c..3.1.5           0.
    rhs...01  c..3.1.6           0.
    rhs...01  c..3.1.7           0.
    rhs...01  c..3.2.1           0.
    rhs...01  c..3.2.2           0.
    rhs...01  c..3.2.3           0.
    rhs...01  c..3.2.4           0.
    rhs...01  c..3.2.5           0.
    rhs...01  c..3.2.6           0.
    rhs...01  c..3.2.7           0.
endata
```

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