# Программа TRANS.EXE

**Исследование операций**

**с применением компьютера**

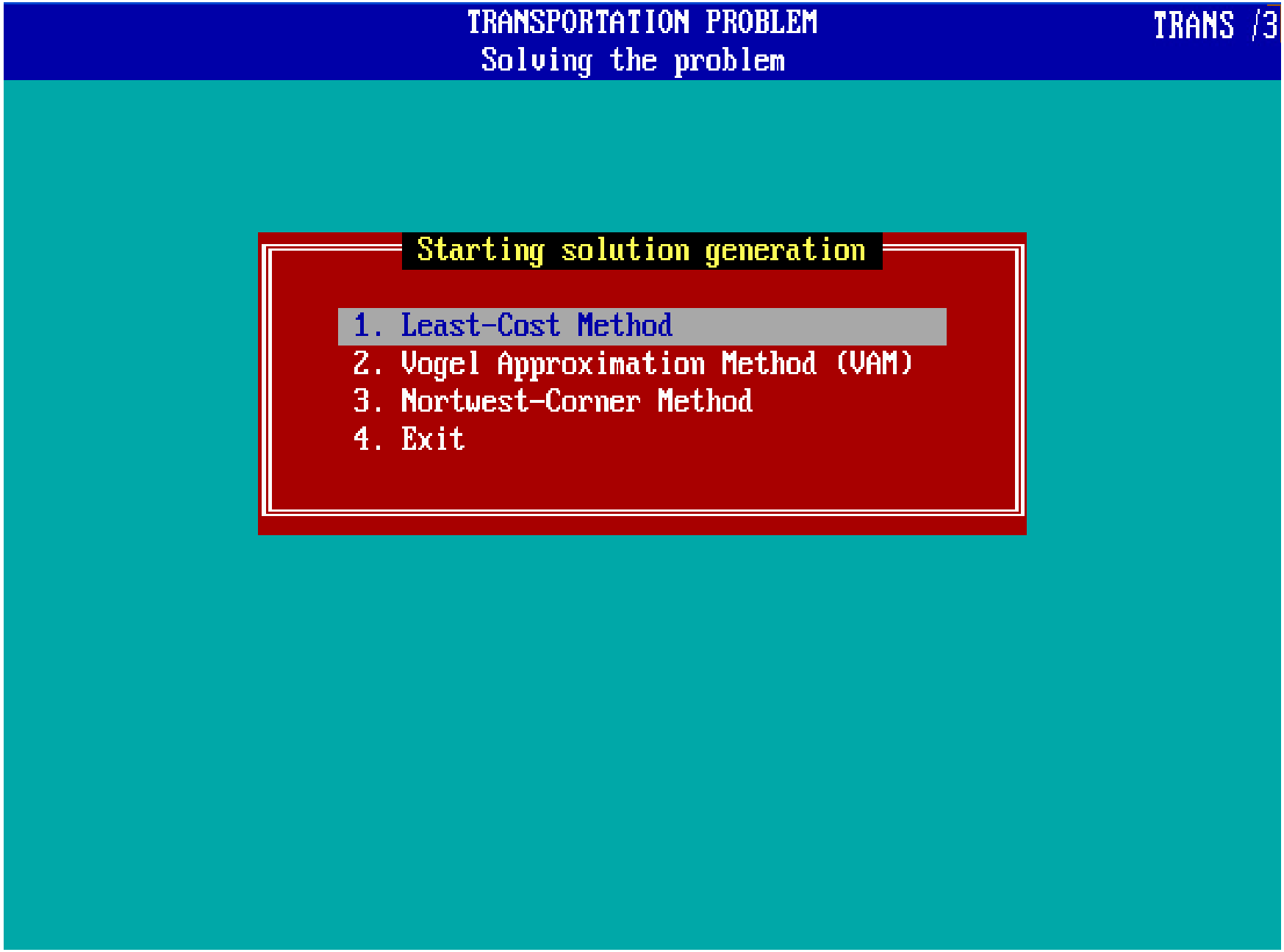
**Версия 2.00a (2007)**

TRANSPORTATION PROBLEM TRANS /Z

Reading problem from a file

Number of origins (max.20) 5
Number of destinations (max.20) 5

| Origin | 1 | 2 | 3 | 4 | 5 | Destination |
|---|---|---|---|---|---|---|
| | Unit cost matrix | | | | | Supply |
| 1 | 16 | 20 | 34 | 8 | 12 | 300 |
| 2 | 22 | 12 | 18 | 16 | 20 | 200 |
| 3 | 10 | 8 | 24 | 20 | 6 | 400 |
| 4 | 12 | 16 | 20 | 28 | 14 | 100 |
| 5 | 22 | 14 | 12 | 24 | 10 | 500 |
| | 100 | 200 | 300 | 400 | 500 | Demand |


TRANSPORTATION PROBLEM
Solving the problem
TRANS /3
Starting solution generation
1. Least-Cost Method
2. Vogel Approximation Method (VAM)
3. Nortwest-Corner Method
4. Exit

TRANSPORTATION PROBLEM
Solving the problem
TRANS /4

Least-Cost Method

Starting solution

| | Supply |
|---|---|
| | 300 |
| | 200 |
| | 400 |
| | 100 |
| | 500 |

| 100 | 200 | 300 | 400 | 500 | Demand |
|---|---|---|---|---|---|

Unit cost matrix

| | | | | |
|---|---|---|---|---|
| 16 | 20 | 34 | 8 | 12 |
| 22 | 12 | 18 | 16 | 20 |
| 10 | 8 | 24 | 20 | 6 |
| 12 | 16 | 20 | 28 | 14 |
| 22 | 14 | 12 | 24 | 10 |

Enter number of basic cells 9

TRANSPORTATION PROBLEM
Solving the problem
TRANS /5

Least-Cost Method

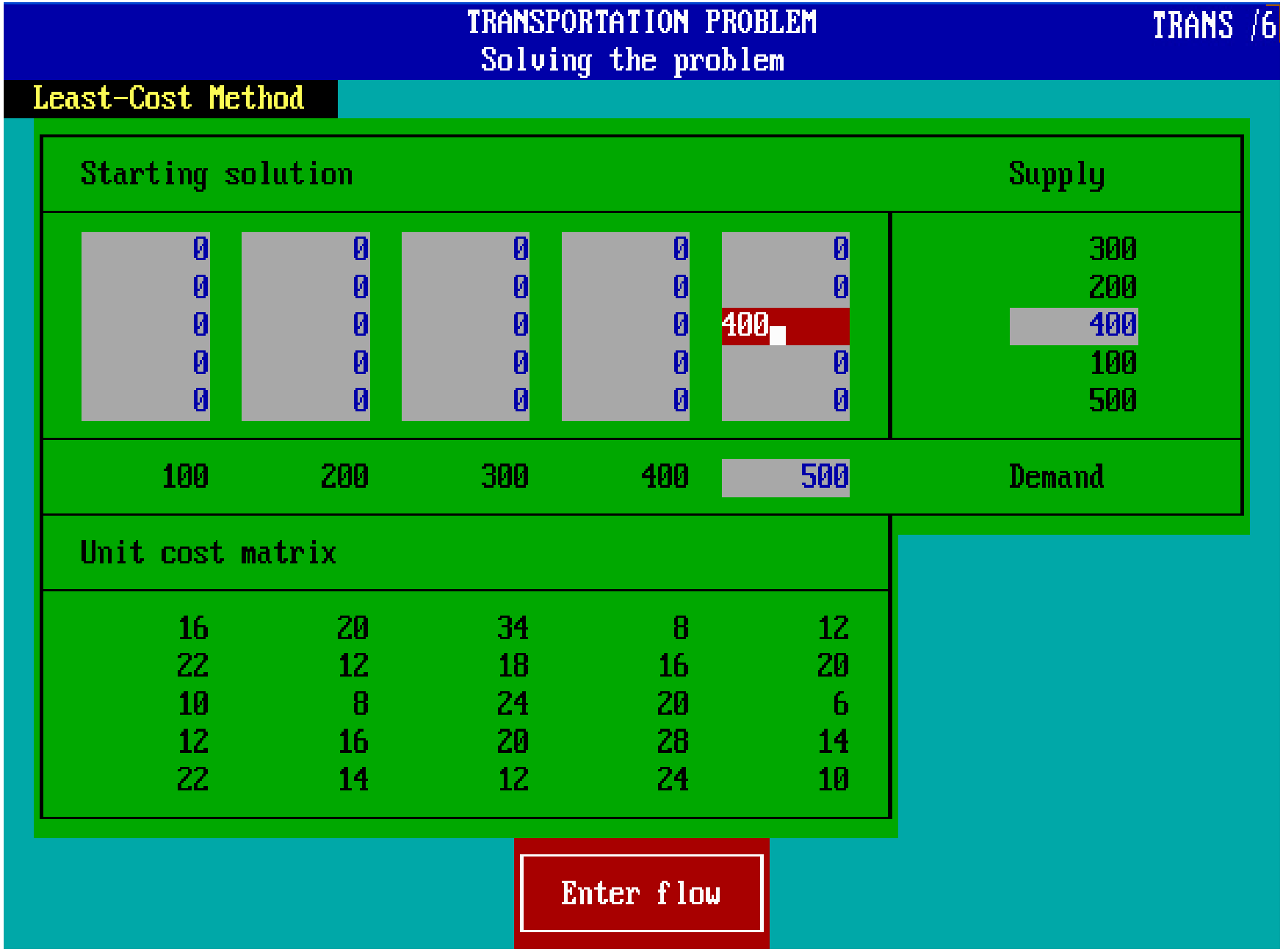
Starting solution

| | | | | | Supply |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 300 |
| 0 | 0 | 0 | 0 | 0 | 200 |
| 0 | 0 | 0 | 0 | 0 | 400 |
| 0 | 0 | 0 | 0 | 0 | 100 |
| 0 | 0 | 0 | 0 | 0 | 500 |
| 100 | 200 | 300 | 400 | 500 | Demand |

Unit cost matrix

| | | | | |
|---|---|---|---|---|
| 16 | 20 | 34 | 8 | 12 |
| 22 | 12 | 18 | 16 | 20 |
| 10 | 8 | 24 | 20 | 6 |
| 12 | 16 | 20 | 28 | 14 |
| 22 | 14 | 12 | 24 | 10 |

Select the basic cell


TRANSPORTATION PROBLEM
Solving the problem
TRANS /6
Least-Cost Method
Starting solution
Supply
0 0 0 0 0 300
0 0 0 0 0 200
0 0 0 0 400 400
0 0 0 0 0 100
0 0 0 0 0 500
100 200 300 400 500
Demand
Unit cost matrix
16 20 34 8 12
22 12 18 16 20
10 8 24 20 6
12 16 20 28 14
22 14 12 24 10
Enter flow

TRANSPORTATION PROBLEM
Solving the problem
TRANS /7

Least-Cost Method

Starting solution

| | | | | | Supply |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 300 |
| 0 | 0 | 0 | 0 | 0 | 200 |
| 0 | 0 | 0 | 0 | 400 | 0 |
| 0 | 0 | 0 | 0 | 0 | 100 |
| 0 | 0 | 0 | 0 | 0 | 500 |
| 100 | 200 | 300 | 400 | 100 | Demand |

Unit cost matrix

| | | | | |
|---|---|---|---|---|
| 16 | 20 | 34 | 8 | 12 |
| 22 | 12 | 18 | 16 | 20 |
| 10 | 8 | 24 | 20 | 6 |
| 12 | 16 | 20 | 28 | 14 |
| 22 | 14 | 12 | 24 | 10 |

What do you want to eliminate Origin Destination

TRANSPORTATION PROBLEM TRANS /8

Solving the problem

Iteration 1

Feasible solution

| | | | | | Supply |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 300* | 0 | 300 |
| 0 | 200* | 0 | 0 | 0 | 200 |
| 0 | 0 | 0 | 0 | 400* | 400 |
| 100* | 0 | 0 | 0 | 0 | 100 |
| 0* | 0* | 300* | 100* | 100* | 500 |
| 100 | 200 | 300 | 400 | 500 | Demand |

Unit cost matrix

| | | | | |
|---|---|---|---|---|
| 16 | 20 | 34 | 8 | 12 |
| 22 | 12 | 18 | 16 | 20 |
| 10 | 8 | 24 | 20 | 6 |
| 12 | 16 | 20 | 28 | 14 |
| 22 | 14 | 12 | 24 | 10 |

Objective function value

15400

TRANSPORTATION PROBLEM
Solving the problem
TRANS /9

Iteration 1

Unit cost matrix

| | | | | |
|---|---|---|---|---|
| 16 | 20 | 34 | 8* | 12 |
| 22 | 12* | 18 | 16 | 20 |
| 10 | 8 | 24 | 20 | 6* |
| 12* | 16 | 20 | 28 | 14 |
| 22* | 14* | 12* | 24* | 10* |

System of equations

u(1) + v(4) + 8 = 0
u(2) + v(2) + 12 = 0
u(3) + v(5) + 6 = 0
u(4) + v(1) + 12 = 0
u(5) + v(1) + 22 = 0
u(5) + v(2) + 14 = 0
u(5) + v(3) + 12 = 0
u(5) + v(4) + 24 = 0
u(5) + v(5) + 10 = 0

Enter system of equations

TRANSPORTATION PROBLEM TRANS/10

Solving the problem

Iteration 1

Unit cost matrix

| | | | | | u(i) |
|---|---|---|---|---|---|
| 16 | 20 | 34 | 8* | 12 | 0 |
| 22 | 12* | 18 | 16 | 20 | -14 |
| 10 | 8 | 24 | 20 | 6* | -12 |
| 12* | 16 | 20 | 28 | 14 | -6 |
| 22* | 14* | 12* | 24* | 10* | -16 |
| -6 | 2 | 4 | -8 | 6 | v(j) |

Optimality coefficients matrix

| | | | | |
|---|---|---|---|---|
| 10 | 22 | 38 | 0 | 18 |
| 2 | 0 | 8 | -6 | 12 |
| -8 | -2 | 16 | 0 | 0 |
| 0 | 12 | 18 | 14 | 14 |
| 0 | 0 | 0 | 0 | 0 |

Enter optimality coefficients

TRANSPORTATION PROBLEM TRANS/11

Solving the problem

Iteration 1

| Unit cost matrix | | | | | u(i) |
|---|---|---|---|---|---|
| 16 | 20 | 34 | 8* | 12 | 0 |
| 22 | 12* | 18 | 16 | 20 | -14 |
| 10 | 8 | 24 | 20 | 6* | -12 |
| 12* | 16 | 20 | 28 | 14 | -6 |
| 22* | 14* | 12* | 24* | 10* | -16 |
| -6 | 2 | 4 | -8 | 6 | v(j) |

Optimality coefficients matrix

| | | | | |
|---|---|---|---|---|
| 10 | 22 | 38 | 0 | 18 |
| 2 | 0 | 8 | -6 | 12 |
| -8 | -2 | 16 | 0 | 0 |
| 0 | 12 | 18 | 14 | 14 |
| 0 | 0 | 0 | 0 | 0 |

Is the solution optimal ? Yes No

TRANSPORTATION PROBLEM
Solving the problem
TRANS/12

Iteration 1

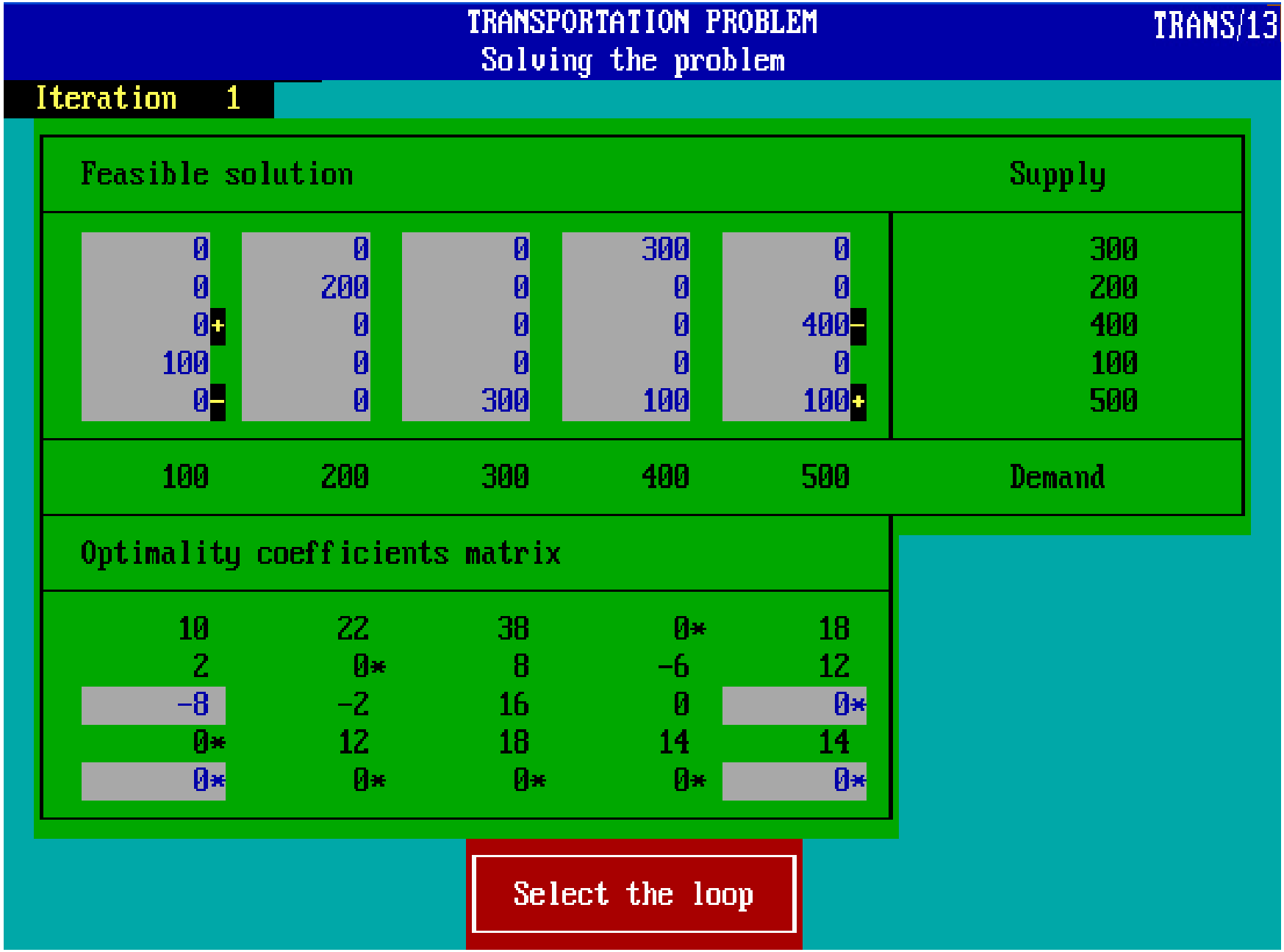
Feasible solution

| | | | | | Supply |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 300 | 0 | 300 |
| 0 | 200 | 0 | 0 | 0 | 200 |
| 0 | 0 | 0 | 0 | 400 | 400 |
| 100 | 0 | 0 | 0 | 0 | 100 |
| 0 | 0 | 300 | 100 | 100 | 500 |
| 100 | 200 | 300 | 400 | 500 | Demand |

Optimality coefficients matrix

| | | | | |
|---|---|---|---|---|
| 10 | 22 | 38 | 0* | 18 |
| 2 | 0* | 8 | -6 | 12 |
| -8 | -2 | 16 | 0 | 0* |
| 0* | 12 | 18 | 14 | 14 |
| 0* | 0* | 0* | 0* | 0* |

Select the cell entering the basis


TRANSPORTATION PROBLEM
Solving the problem
TRANS/13
Iteration 1
Feasible solution
Supply
0 0 0 300 0 300
0 200 0 0 0 200
0+ 0 0 0 400− 400
100 0 0 0 0 100
0− 0 300 100 100+ 500
100 200 300 400 500 Demand
Optimality coefficients matrix
10 22 38 0* 18
2 0* 8 -6 12
-8 -2 16 0 0*
0* 12 18 14 14
0* 0* 0* 0* 0*
Select the loop

TRANSPORTATION PROBLEM — TRANS/14

Solving the problem

Iteration 1

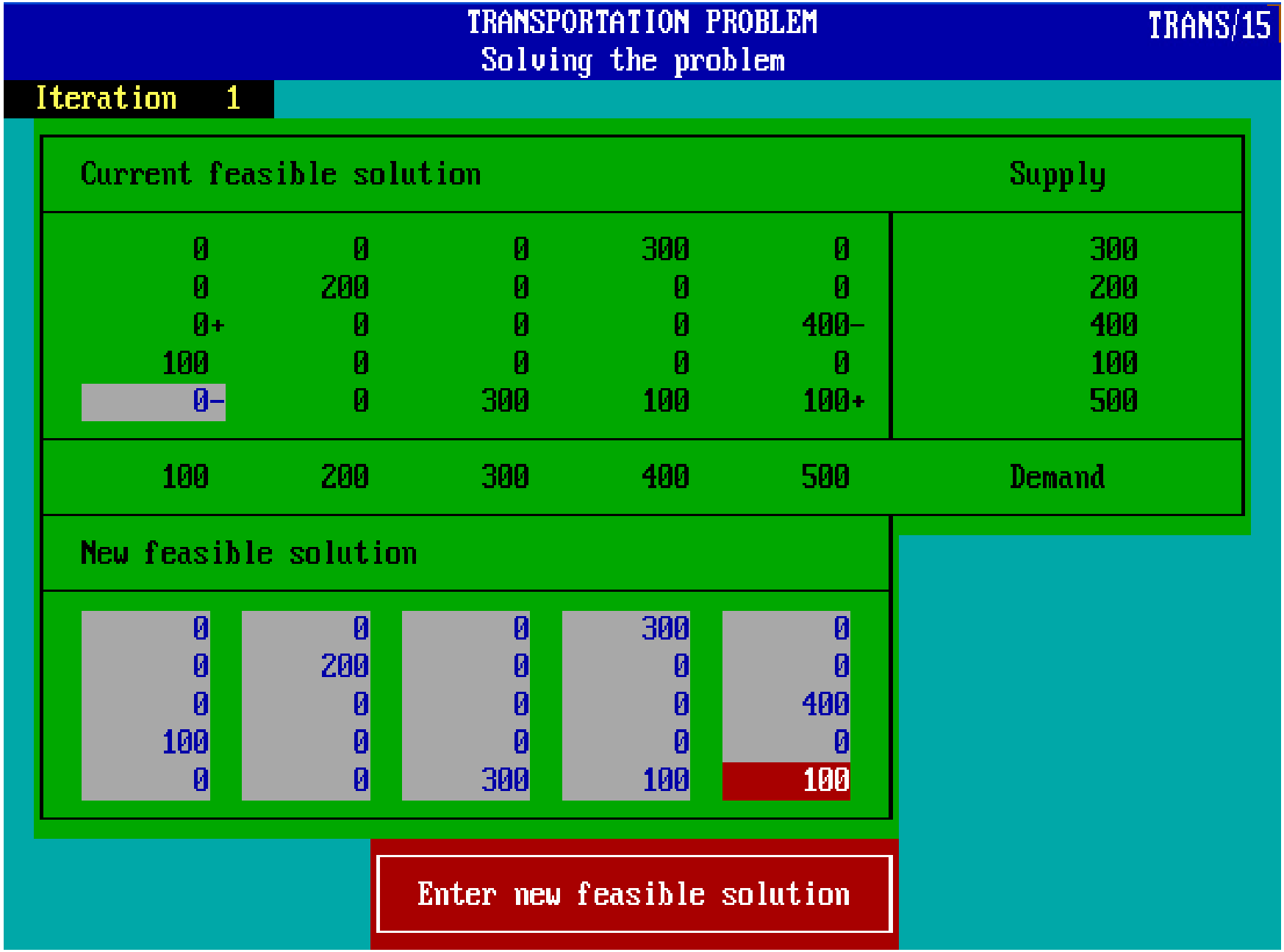
**Feasible solution**

| | | | | | Supply |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 300 | 0 | 300 |
| 0 | 200 | 0 | 0 | 0 | 200 |
| 0+ | 0 | 0 | 0 | 400− | 400 |
| 100 | 0 | 0 | 0 | 0 | 100 |
| 0− | 0 | 300 | 100 | 100+ | 500 |
| 100 | 200 | 300 | 400 | 500 | Demand |

**Optimality coefficients matrix**

| | | | | |
|---|---|---|---|---|
| 10 | 22 | 38 | 0* | 18 |
| 2 | 0* | 8 | -6 | 12 |
| -8 | -2 | 16 | 0 | 0* |
| 0* | 12 | 18 | 14 | 14 |
| 0* | 0* | 0* | 0* | 0* |

Select the cell leaving the basis


TRANSPORTATION PROBLEM
Solving the problem
TRANS/15
Iteration 1
Current feasible solution
Supply
0 0 0 300 0 300
0 200 0 0 0 200
0+ 0 0 0 400- 400
100 0 0 0 0 100
0- 0 300 100 100+ 500
100 200 300 400 500 Demand
New feasible solution
0 0 0 300 0
0 200 0 0 0
0 0 0 0 400
100 0 0 0 0
0 0 300 100 100
Enter new feasible solution

TRANSPORTATION PROBLEM
Solving the problem
TRANS/16

Optimal solution

| Optimal solution | | | | | Supply |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 300* | 0 | 300 |
| 0 | 100* | 0 | 100* | 0 | 200 |
| 0* | 100* | 0 | 0 | 300* | 400 |
| 100* | 0 | 0 | 0 | 0 | 100 |
| 0 | 0 | 300* | 0 | 200* | 500 |
| 100 | 200 | 300 | 400 | 500 | Demand |

| Optimality coefficients matrix | | | | | Objective function value |
|---|---|---|---|---|---|
| 10 | 16 | 30 | 0 | 10 | |
| 8 | 0 | 6 | 0 | 10 | 14600 |
| 0 | 0 | 16 | 8 | 0 | |
| 0 | 6 | 10 | 14 | 6 | |
| 8 | 2 | 0 | 8 | 0 | |

Optimal solution has been obtained in iteration 4