

ASSIGNMENT MODEL CASES

- Four building companies have presented their projects to a competition called to build buildings A, B, C and D. Each builder must be assigned the construction of a building. The following tableau shows the time each building company needs to build each of the buildings. The objective is to assign the construction of a building to each building company so that the total building time is minimized.

	1	2	3	4
A	58	58	60	54
B	66	70	70	78
C	106	104	100	95
D	52	54	64	54

- A company has 4 machines available for assignment to 4 tasks. Any machine can be assigned to any task, and each task requires processing by one machine. The time required to set up each machine for the processing of each task is given in the table below.

TIME (Hours)

	Task 1	Task 2	Task 3	Task 4
Machine 1	13	4	7	6
Machine 2	1	11	5	4
Machine 3	6	7	2	8
Machine 4	1	3	5	9

The company wants to minimize the total setup time needed for the processing of all four tasks.

- A plant manager has four subordinates, and four tasks to be performed. The subordinates differ in efficiency and the tasks differ in their intrinsic difficulty. This estimate of the times each man would take to perform each task is given in the effectiveness matrix below.

	I	II	III	IV
A	8	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

How should the tasks be allocated, one to a man, so as to minimize the total man hours?

- A dairy plant has five milk tankers I, II, III, IV & V. These milk tankers are to be used on five delivery routes A, B, C, D, and E. The distances (in kms) between dairy plant and the delivery routes are given in the following distance matrix

	I	II	III	IV	V
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

How the milk tankers should be assigned to the chilling centers so as to minimize the distance travelled?

5. A travelling salesman plans to visit n cities. He wishes to visit each city only once, and again arriving back to his home city from where he started. So that the total travelling distance is minimum.

Consider the following traveling salesman problem. Design a tour to five cities to the salesman such that minimize the total distance. Distance between cities is shown in the following matrix.

	1	2	3	4	5
1	-	10	3	6	9
2	5	-	5	4	2
3	4	6	-	7	8
4	7	1	3	-	4
5	3	2	6	5	-

6. A Travelling salesman has to visit five cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling cost (in Rs.) of each city from a particular city is given below.

		To city				
		A	B	C	D	E
From city	A	α	2	5	7	1
	B	6	α	3	8	2
	C	8	7	α	4	7
	D	12	4	6	α	5
	E	1	3	2	8	α

What should be the sequence of the salesman's visit, so that the cost is minimum?

7. A travelling salesman, named Rolling Stone plans to visit five cities 1, 2, 3, 4 & 5. The travel time (in hours) between these cities is shown below:

		To				
From	1	2	3	4	5	
1	∞	5	8	4	5	
2	5	∞	7	4	5	
3	8	7	∞	8	6	
4	4	4	8	∞	8	
5	5	5	6	8	∞	

How should Mr. Rolling Stone schedule his touring plan in order to **minimize** the total travel **time**, if he visits each city once a week?

8. A Salesman wants to visit A, B, C, D and E. He doesn't want to visit any city twice before completing his tour of all cities and wishes to return to the point of starting journey. Cost of going one city to another is shown in the following table. Find the least cost route.

	A	B	C	D	E
A	-	2	5	7	1
B	6	-	3	8	2
C	8	7	-	4	7
D	12	4	6	-	5
E	1	3	2	8	-