

ASSIGNMENT

1. Pollock Corporation has four plants each of which can manufacture any one of four products. Production costs differ from one plant to another as do sales revenue. Given the revenue and cost data below, obtain which product each plant should produce to maximise profit :

Plant	Sales revenue (` '000s)					Production cost (` '000s)			
	Product					Product			
	1	2	3	4		1	2	3	4
A	50	68	49	62		49	60	45	61
B	60	70	51	74		55	63	45	69
C	55	67	53	60		52	62	49	58
D	68	65	64	69		65	64	58	66

2. Kingfisher airline operating 7 days a week has given the following time-table. Crews must have a minimum layover of 5 hours between flights. Obtain the pairing flights that minimizes layover time away from home. For any given pairing the crew will be based at the city that results in the smaller layover :

Chennai-Mumbai			Mumbai-Chennai		
Flight Number	Depart.	Arrive	Flight Number	Depart.	Arrive
A1	6 AM	8 AM	B1	8 AM	10 AM
A2	8 AM	10 AM	B2	9 AM	11 AM
A3	2 PM	4 PM	B3	2 PM	4 PM
A4	8 PM	10 PM	B4	7 PM	9 PM

3. A private firm employs typists on hourly piece rate basis for their daily work. Five typists are working in that firm and their charges and speeds are different. On the basis of some earlier understanding only one job is given to one typist and the typist is paid for full hours even when he or she works for a fraction of an hour. Find the least cost allocation for the following data :

Typist	Rate per hour (`)	Number of pages Typed/hr.	Job	No. of pages
A	5	12	P	199
B	6	14	Q	175
C	3	8	R	145
D	4	10	S	298
E	4	11	T	178

4. GOODLUCK Company has taken the third floor of a multistoried building for rent with a view to locate one of their zonal offices . There are five main rooms in this floor to be assigned to five managers. Each room has its own advantages and disadvantages. Some have windows, some are closer to the washrooms or to the canteen or secretarial pool. The rooms are of all different sizes and shapes. Each of the five managers were asked to rank their room preferences amongst the rooms 301, 302, 303, 304 and 305. Their preferences were recorded in a table as indicated below :

MANAGER				
M1	M2	M3	M4	M5
302	302	303	302	301
303	304	301	305	302
304	305	304	304	304
	301	305	303	
		302		

Most of the managers did not list all the five rooms since they were not satisfied with some of these rooms and they have left off these from the list. Assuming that their preferences can be quantified by numbers, find out as to which manager should be assigned to which room so that their total preference ranking is a minimum.

5. XYZ Airlines is a small air freight company. The company has 6 aircraft of different types, namely – 3 Type 'A', 2 Type 'B' and 1 Type 'C' whose operating cost and load carrying capacity are as follows -

Aircraft Type	Fixed Cost (` Per day)	Variable Cost		Capacity (Tons)
		Per mile	per ton	
A	800	0.60	30	10
B	700	0.40	35	8
C	500	1.00	25	4

For any journey, variable costs are assigned on the basis of both the distance flown and the load being carried. All fixed and variable cost components are then added to obtain the relevant total cost. On one particular day, there are 5 loads to be delivered to various destinations the size of load and distances being:

Load	Size (tons)	Distance (miles)
1	10	200
2	2	550
3	8	320
4	5	280
5	3	450

The distance given above are direct from the company's base and in each case there is no return load so that the aircraft will fly back empty. This means that mileage costs are incurred on both, the outward and return journey can be completed within one day and each aircraft can only fly one load in any one day. You may also assume that loads cannot be divided up and delivered in parts.

Required:

- For each of the five loads, determine the cost of delivery using each of the feasible aircraft types.
- Set up the cost matrix for assigning each load to each particular aircraft.

Using an appropriate procedure, decide which aircraft should be used for delivering each load so that the total cost is minimized. What is the total cost of all five deliveries.