

## BA 3352: Capacity - Layout Questions

1. Solve Problem 7 on p.192 of the textbook. Hint: Draw a graph where the x-axis is the number of units and y-axis is the cost. Draw the cost under each alternative to figure out which alternative is the best when.
2. This exercise is about a grocery store such as Tom Thumb or Albertson.
  - a) Go to a grocery store. Draw the store's layout (not to scale) and clearly indicate the following departments: meats (M), fresh produce (FP), dairy (D), soft drinks (SD), cereals (C), can foods (CF), pharmacy (P). Write down the store's name and thje address.
  - b) Almost all supermarkets arrange their layouts to maximize sales. How would you alter the layout in a) to minimize the weight carried by customers in the market? Do not prepare another layout. It suffices to discuss, possibly via examples, what the new layout will look like and why?
3. Read Solved Problem 3 on pp.253-255. Now consider a different problem with locations A,B,C,D and departments 1,2,3,4. Note that the symmetric distances (in meters) among locations (A,B,C,D) are

From To	A	B	C	D
A	0	40	80	70
B		0	40	50
C			0	60
D				0

and nonsymmetric number of trips among departments (1,2,3,4) are

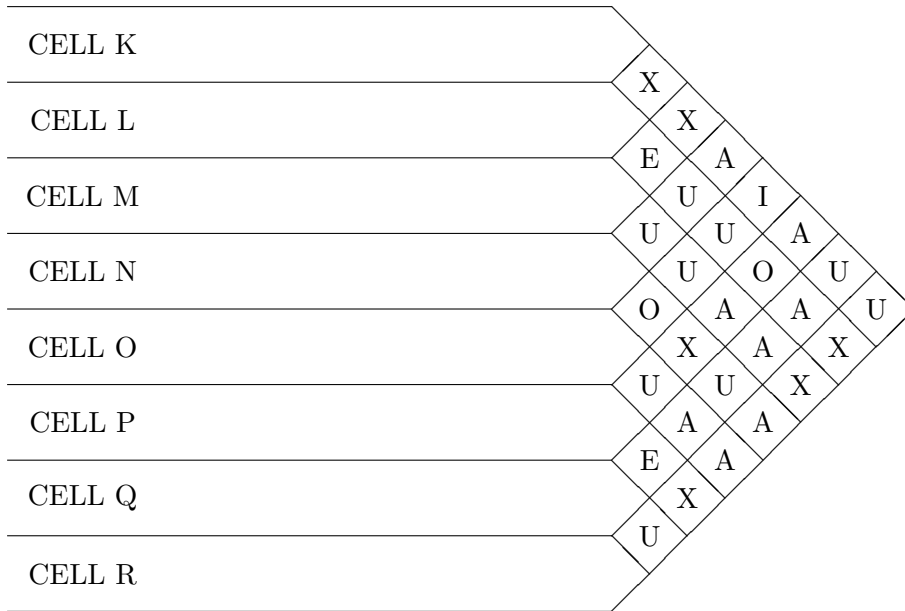
From To	1	2	3	4
1	0	1	2	3
2	0	0	4	4
3	0	0	0	2
4	5	5	3	0

Compute the total distance traveled per day for the following location-department assignments: A-1, B-2, C-3, D-4 and A-4, B-3, C-2, D-1. In the assignment A-1, B-2, C-3, D-4, department 1 is at location A and department 2 is at location B so the distances between the department 1 and 2 is 40 metres, which is the distance between locations A and B. In the assignment A-4, B-3, C-2, D-1, department 1 is at location D and department 2 is at location C so the distances between the department 1 nad 2 is 60 meters, which is the distance between locations C and D. Between A-1, B-2, C-3, D-4 and A-4, B-3, C-2, D-1, which assignment is better?

4. Refer to the precedence graph at the bottom of p.256 of the textbook. The company wants to produce 240 units every day using eight hour daily shifts.
  - a) What is OT and CT?
  - b) Assign operations to workstations using the greatest task time rule.
  - c) Note the number of worksatations  $N$  necessary and compute efficiency.
5. Referring to question 3 above.
  - a) Assign operations to workstations using the greatest positional weight rule.
  - b) Note the number of worksatations  $N$  necessary and compute efficiency.
6. Consider a general assembly line balancing problem. Suppose that we do not change the problem data (operation times, precedence structure, cycle time) but use two different assignment rules (say postional

weight and operation time) to obtain two different assignments. Is it possible that one assignment has larger efficiency and larger  $N$  than the other? Explain?

7. The activity relationship chart for a machine shop is shown in the figure below.




Arrange the eight departments in a  $2 \times 4$  grid: