BUS ADM 370 - Introduction to Supply Chain Management
Homework 1 (50 points)

For all the problems, to receive full scores, you have to show your complete and accurate work, i.e., show how you calculated the numbers you use. If you only provide the final answers without computations, you will not receive a full score (and will miss the opportunity of partial credits).

Problem 1. (10 points)
"Best in the World" bakery sells plain bagels to its customers in its two units on a daily basis. The manager of the bakery wants to identify which of the bakery units faces more predictable demand for bagels. To achieve this, the manager collected data about the number of bagels sold on a monthly basis as displayed below. Which unit has more predictable demand for bagels?

	Demand for Bagels	
Month	UNIT A	UNIT B
1	112	102
2	175	163
3	90	72
4	74	113
5	114	136
6	99	173
7	111	84
8	141	175
9	66	121
10	162	145
11	152	78
12	95	137

Problem 2. (22 points)
USB Corp. is designing a product layout for a new product. They plan to use this production line ten hours a day in order to meet forecasted demand of 900 units per day. The following table describes the tasks necessary to produce this product:

Task	Time (secs)	Immediate Predecessor
I	36	none
J	14	I
K	8	J
L	18	J
M	14	K
N	24	L, M
O	38	N

a. Draw the precedence diagram for this line with the processing times for each task displayed. (5 points)
b. Assign tasks to work stations using the greatest number of following tasks as the heuristic rule. Use the tiebreaker rule of assigning the task with the longest processing time. (12 points)
c. Compute the efficiency and the percentage of idle time for the system. (5 points)

Problem 3. (18 points)

The following data were collected during a 14 month from a company's sales reports. The report shows for each month, how much the company has spent for advertising (x) and how much sales were made during that month (y). Both the advertising and sales dollars are in units of $million. The Chief Executive Officer of the company is interested in the impact of the advertising spending on the actual sales.

Month	x	y		Month	x	y
1	24	79		8	23	83
2	32	85		9	19	75
3	45	89		10	20	77
4	42	86		11	17	90
5	56	101		12	29	93
6	52	100		13	38	95
7	35	88		14	26	90

(a) Provide the scatter plot for the data with the trend line. (4 points)

(b) Obtain a linear regression line for the data. (Hint: You need to calculate a and b to get the linear regression equation: $y = a + bx$) (8 points)

(c) Predict the sales figures in months 15 and 16 if the advertising budgets allocated for months 15 and 16 are $25 million and $30 million, respectively. (6 points)

Bonus Problem (6 points) (Bonus points will be added to your homework score).

A manager has been using a certain technique to forecast demand for gallons of ice cream for the past six periods. Actual and predicted amounts are shown below. Would a naive forecast have produced better results? Show all your work and calculations.

Period	Demand	Forecast
1	90	87
2	85	88
3	91	87
4	92	89
5	95	90
6	88	92