MBA 515 - COMPUTER HOMEWORK #2 - Prof. Richard B. Goldstein

All of these are to be done on the Computer (each worth 5%)

(1) NETWORKS

Text: Chapter 6, problem #10 (Assignment) **and**
Chapter 6, problem #27 (Shortest Route)

(2) PERT/CPM

Given the following activities and their predecessor list

(a) Construct a PERT/CPM network (this is not done on the computer)
(b) What is the slack on activities E and G?
(c) What is the critical path(s) and what is the expected time and standard deviation for completion?
(d) What is the probability that the project takes longer than 22 days to complete? What is the probability that the project is completed within 20 days? (hint: use a normal distribution table - not on computer)

Activity	Immediate Predecessor	Optimistic Time	Most likely Time	Pessimistic Time
A	-	2	3	4
B	-	2	3	4
C	-	2	4	6
D	C	3	3	3
E	A, D	4	5	12
F	B, C	2	3	10
G	C	4	5	6
H	D	3	4	5
I	G, H	2	3	4
J	E	3	4	11
K	I	2	2	2
L	F	4	7	10

(3) WAITING LINES

Rhody Medical Clinic has 3 general practitioners who see patients daily on a first come, first served basis. On average 11 patients arrive at the clinic each hour. Each doctor spends an average of 15 minutes with a patient. The patients wait in the waiting room until one of the three doctors is able to see them. However, since patients typically do not feel well when they arrive, the doctors do not believe it is good medical practice to have a patient wait longer than 30 minutes. Each doctor is paid $96 per hour (service cost) and the clinic is going to have a waiting cost of $12 per hour (this is a penalty in perceived lost business).

(a) What is the waiting time in **minutes**, percentage of the time all doctors are idle, and the total cost?
(b) Repeat the above calculations with 4 doctors.
(c) Considering the answers in (a) and (b) should the clinic add a fourth doctor? Explain the **pros** and **cons**.

(4) FORECASTING

Text: Chapter 15, problems #20, #29, and #31
Note: these can also be done using a spreadsheet.

(5) SIMULATION

Simulate the rolling of 2 dice **360** times. Use my **JavaScript** site:

http://www.providence.edu/mcs/rbg/mba/javascript-simulation.htm

and the values given below:

Sum	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Freq.	**1**	**2**	**3**	**4**	**5**	**6**	**5**	**4**	**3**	**2**	**1**

note: there are 11 bins

Based **both** upon the **expected probabilities** and the **simulation probabilities** what is

(a) the probability of a sum greater than or equal to nine: $P\{sum \geq 9\}$?
(b) the probability of a sum of seven **or** eleven: $P\{sum = 7 \cup sum = 11\}$?