

Math/Mgmt 3502 (Ng/Fall 2007)
Assignment 3
Due November 21, 2007.
(Please bring it to my office by noon)

1. (10pts.) Construct the network representation of a project consisting of the activities, A, B, \dots, P , with the following precedence relationships.
- (a) A, B , and C , the first activities of the project, can start simultaneously.
 - (b) Activities D, E , and F start immediately after A is completed.
 - (c) Activities I and G start after both B and D are completed.
 - (d) Activity H starts after both C and G are completed.
 - (e) Activities K and L succeed activity I .
 - (f) Activity J succeeds both E and H .
 - (g) Activities M and N succeed F but cannot start until E and H are completed.
 - (h) Activity O succeeds M and I .
 - (i) Activity P succeeds J, L , and O .
 - (j) Activities K, N , and P are the terminal jobs of the project.
2. (15pts.) Table 1 provides the data for the purpose of preparing next year's budget. Your company must gather information from its sales, production, accounting, and treasury departments. These data indicate the activities and their durations. Prepare the network model of the problem and carry out the critical path computations, i.e. find the critical path and find the duration of this critical path.

<i>Activity Code</i>	<i>Task</i>	<i>Immediate predecessor(s)</i>	<i>Duration (days)</i>
A	Forecast sales volume	-	10
B	Study competitive market	-	7
C	Design item and facilities	A	5
D	Prepare production schedules	C	3
E	Estimate cost of production	D	2
F	Set sales price	B, E	1
G	Prepare budget	E, F	14

Table 1 : Table for budget problem

3. (15pts.) Table 2 summarizes the activities for relocating 1700 feet of 13.8 kilo-volt overhead primary line due to the widening of the road section in which the line is presently installed. (Such a project must be conducted with care since it would not be prudent to let someone get zapped ☺). Draw a network representation of the project, identify all critical activities and critical path(s), and find out how long it will take to complete this project.

<i>Activity Code</i>	<i>Task</i>	<i>Immediate predecessor(s)</i>	<i>Duration (days)</i>
A	Job review	-	1
B	Advice customers of temporary outage	A	.5
C	Requisition stores	A	1
D	Scout job	A	.5
E	Secure poles and materials	C, D	3
F	Distribute poles	E	3.5
G	Pole location coordination	D	.5
H	Restake	G	.5
I	Dig holes	H	3
J	Frame and set poles	F, I	4
K	Cover old conductors	F, I	1
L	Pull new conductors	J,K	2
M	Install remaining material	L	2
N	Sag conductor	L	2
O	Trim trees	D	2
P	De-energize and switch lines	B,M,N,O	.1
Q	Energize and phase new lines	P	.5
R	Clean up	Q	1
S	Remove old conductor	Q	1
T	Remove old poles	S	2
U	Return material to stores	I,R,T	2

Table 2 : Table for power lines problem

4. (15pts.) Handout from *A,S,W - CPM section*, Problem 9
5. (15pts.) Handout from *A,S,W - CPM section*, Problem 19. **In addition to the questions listed on Problem 19**, find the expected completion time of the project, and the variance of the completion time.