OPRE 6398.003 Prescriptive Analytics
Homework 11

Due 04/26/17
(11:30 a.m.)

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Note: 1. Your homework submission must be typewritten.

2. be sure to show detail calculations to earn full credit.

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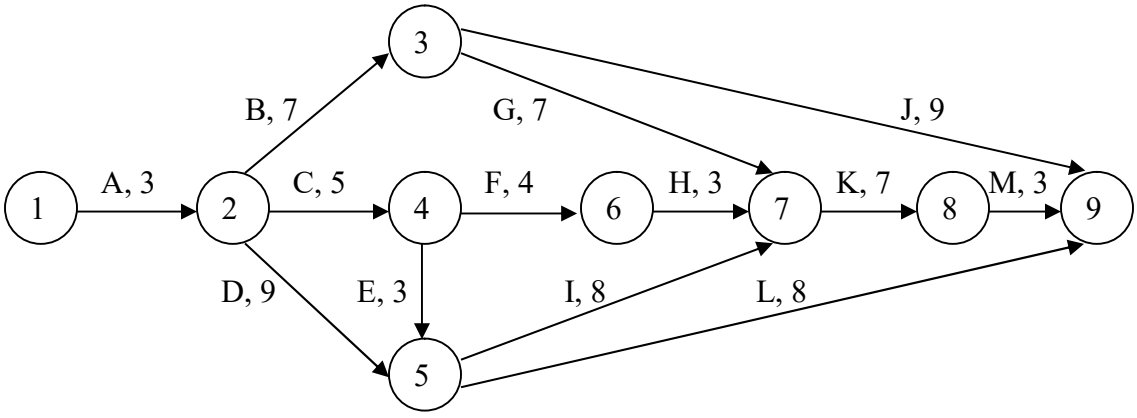
1. Read Readings 15 and 16.

2. The following table summarizes relevant information about the major activities involved in the project of constructing a new laboratory.

Activity	Immediate predecessor	Estimated time (weeks)
A: Form and pour concrete footings	None	3
B: Install turbine test drives	A	7
C: Erect wall	A	5
D: Construct electrical test rooms and equipment mounting facilities	A	9
E: Erect roof	C	3
F: Wire and Plumb	C	4
G: Install exhaust ducts, etc.	B	7
H: Install fixtures	F	3
I: Spay interior with fireproof chemical and let dry	D, E	8
J: Prepare for operation, tune up, and adjust drive units	B	9
K: Install insulation and interior walls	G, H, I	7
L: Install electrical test equipment	D, E	8
M: Finish interior with fireproof paint	K	3

A PERT network for the problem is presented below:



Use the enumeration method to analyze the network and answer the following questions:

(1) What is the critical path?

(2) What are the critical activities?

(3) How long will it take to complete the entire project?

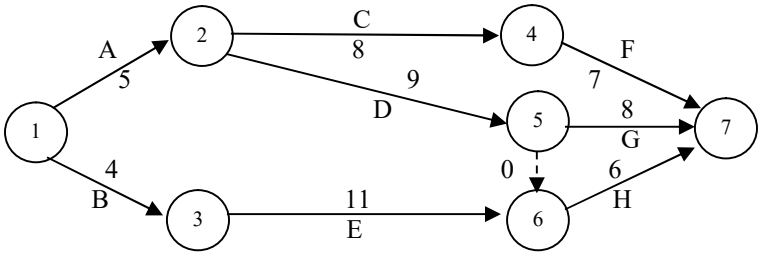
(4) What is the slack for each of the noncritical paths?

(5) If activity J (3-9) is late by six weeks, will it lengthen the project duration? Why or why not?

(6) If activity D (2-5) is late by one week, will it lengthen the project duration? Why or why not?

3. Consider the following PERT network:

(1) Apply the computational algorithm to determine the critical activities, the critical path, and the project duration. Be sure to show both the network and the "houses."



(2) Develop a linear programming model for determining the project duration. It is necessary to present the LP in standard form here.

(3) Run Solver to solve the LP in (2). Be sure to copy and paste the Answer report at the appropriate place in your homework submission.

(4) Is the project duration found in (1) consistent with that found in (3) above?