

MIDTERM 03/08/10

DO YOUR WORK ON THIS HANDOUT. THIS WILL EXPEDITE THE GRADING OF THE PAPERS.

NAME _____

MIDTERM SCORE _____

Please read the problems carefully and provide the information requested and only the information requested in each question. Use the minimum amount of work required to answer each question. Do all your final work on these pages. I have included blank pages where I thought you might need extra space. The test is worth 65 points. (14% of your total grade)

Hand in your test papers no later than 1:45 P.M. or one hour and 45 minutes after you start, whichever is later. It is unfair to your fellow students who hand in their papers on time to use more time than they had. **Carefully consider this time allotment when deciding how to answer the questions.**

The midterm is open notes and open book. Use your calculator or laptop if needed and indicate so on your paper.

A normal probability table is provided at the end of the exam, should you decide that you needed it.

If you want to ask a question, come up to and ask me. Please don't talk to your neighbors. If you need to borrow a calculator or pencil, ask me. It is usually better to make your own assumptions and stating them rather than get an explanation from me.

Remember, each of these problems is relatively short. Do not consider involved, long solutions. Move on to the next problem if you are stuck.

Good luck, I hope you all do well.

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Problem No. 1

A woman is trying to decide in which of four shopping centers to locate her new boutique. Some cater to a higher class of clientele than others, some are in an indoor mall, some have a much greater volume than others, and, of course, rent varies considerably. Because of the nature of her store, she has decided that the class of clientele is the most important consideration. Following this, however, she must pay attention to her expenses, and rent is a major item-probably 90 percent as important as clientele. An indoor, temperature-controlled mall is a big help for stores such as hers where 70 percent of sales are from passersby slowly strolling and window shopping. Thus, she rates this as about 95 percent as important as rent. Last, a higher volume of shoppers means more potential sales; she thus rates this factor as 80 percent as important as rent.

As an aid in visualizing her location alternatives, she has constructed the following table. A "good" is scored as 3, "fair" as 2, and "poor" as 1. Use a weighted score model to help this woman come to a decision. (10 Points)

	Location					
	1	2	3	4		
Class of clientele	Fair	Good	Poor	Good	Good	3
Rent	Good	Fair	Poor	Good	Fair	2
Indoor Mall	Good	Poor	Good	Poor	Poor	1
Volume	Good	Fair	Good	Poor		

	Rating Translation				Weight	Normalized
Class of clientele	2	3	1	3	1	0.288
Rent	3	2	1	3	0.9	0.259
Indoor Mall	3	1	3	1	0.855	0.246
Volume	3	2	3	1	0.72	0.207
					3.475	
Rating	9.425	7.095	6.625	7.275		

Based on weighted score, location 1 is the best

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Problem No. 2

Microsoft Project provides a method for assigning resources to tasks. If you simultaneously add two resources to a task, what happens to the length of the task? Is the result different if I add a second resource to a task after I had assigned another resource earlier? If so how?(5 points)

Simultaneous assignment of resources results in the task duration staying the same and each resource working full time on it.

Adding an additional resources, shortens the duration of the task by a proportional amount.

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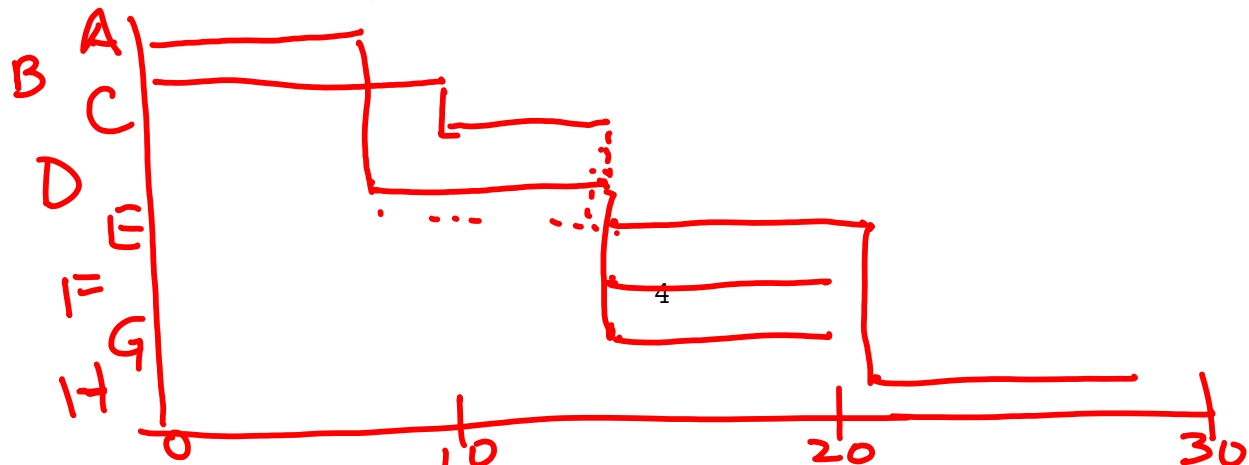
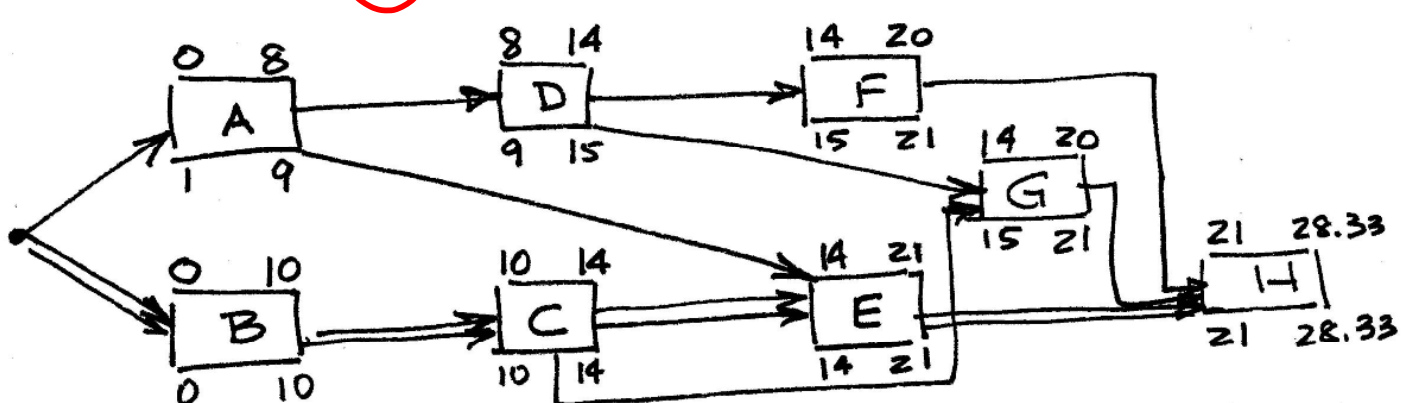
Problem No. 3

Given the project durations and relationships of activities:

1. Draw an AON diagram
2. Draw a Gantt chart
3. Find the critical path(s)
4. Determine the probability of completing the project in 30 days

(10 points)

Activity	Predecessors	Durations			Mean	var	ES	EF	LS	LF	Slack	critical
		Best estimate	Most likely	Worst								
A	-	5	8	11	8.00	1.00	0.00	8.00	1.00	9.00	1.00	No
B	-	10	10	10	10.00	0.00	0.00	10.00	0.00	10.00	0.00	Yes
C	B	4	4	4	4.00	0.00	10.00	14.00	10.00	14.00	0.00	Yes
D	A	4	6	8	6.00	0.44	8.00	14.00	9.00	15.00	1.00	No
E	A,C	6	7	8	7.00	0.11	14.00	21.00	14.00	21.00	0.00	Yes
F	D	3	6	9	6.00	1.00	14.00	20.00	15.00	21.00	1.00	No
G	D,C	4	6	8	6.00	0.44	14.00	20.00	15.00	21.00	1.00	No
H	E,F,G	6	7	10	7.33	0.44	21.00	28.33	21.00	28.33	0.00	Yes
	mean	var	30	z								
BCEH	28.3	0.6	99%	2.24								
ADFH	27.3	2.9	94%	1.57								



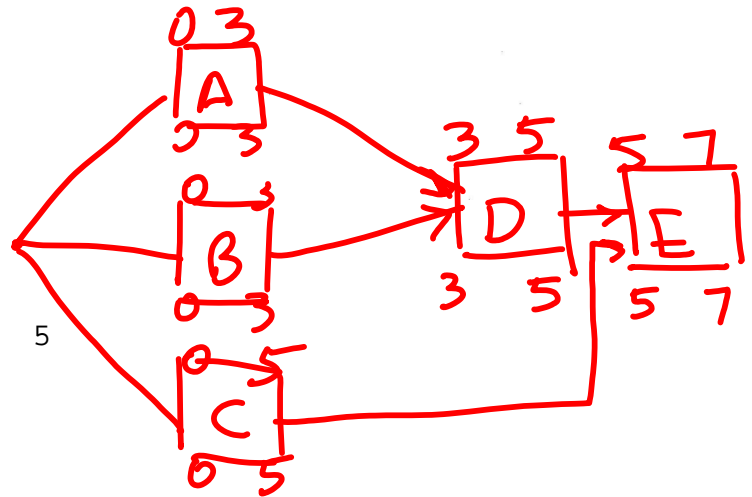
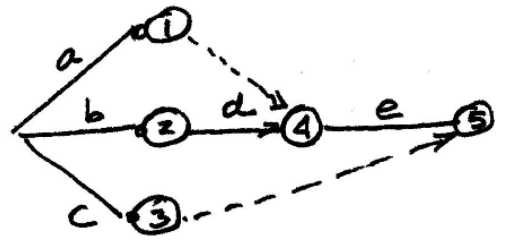
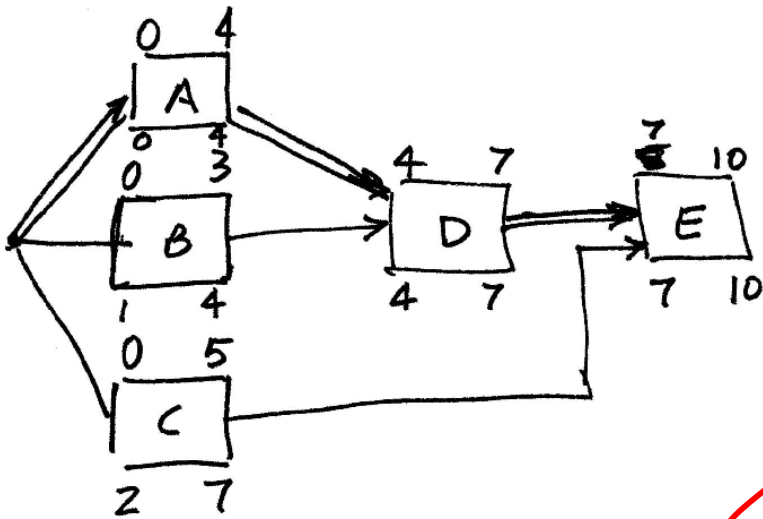
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Problem No. 4

Given the information in the chart below, determine by how many days can the length of the project be reduced if we have \$1000 available for accelerating tasks. The crashing cost is in addition to the normal cost. Can you use all of the available cash? Show the resulting network diagram. Is there any slack left? (10 points)

Activity	Predecessors	Durations		Normal Cost	Crash Cost/day	ES	EF	LS	LF	Slack	critical	Amount	Crash	Actual	
		Normal	Max Crash									to crash	Cost	Time	Normal cost per day
A	-	4	2	\$800	\$250	0.00	4.00	0.00	4.00	0.00	Yes	1	\$250	3	\$200
B	-	3	1	\$450	\$200	0.00	3.00	1.00	4.00	1.00	No	0	\$0	3	\$150
C	-	5	2	\$1,250	\$400	0.00	5.00	2.00	7.00	2.00	No	0	\$0	5	\$250
D	A,B	3	1	\$300	\$200	4.00	7.00	4.00	7.00	0.00	Yes	1	\$200	2	\$100
E	C,D	3	1	\$450	\$225	7.00	10.00	7.00	10.00	0.00	Yes	1	\$225	2	\$150
mean		Total		\$13,050									\$675		
ADE	10.0														
BDE	9.0														
CE	8.0														
Deadline	6 Max Crash cost			\$1,000											
Total Cost	\$13,725														
Node	Event time														
1	3														
2	3														
3	5														
4	5														
5	7														

The time to completion can be reduced by 3 days in several ways and there is no slack left. Not all the cash can be used. He most efficient costs \$675, a less efficient way \$925.



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Problem No. 5

What is the role of tracking signals and learning curves in the budgeting process? (10 points)

The tracking signal shows whether there is systematic upward or downward bias in a series of forecasts when they are compared to actual results. This can be very helpful in improving the accuracy of subsequent forecasts in the budget of a project.

Learning curves are used to predict the rate of learning in a process, i.e., a reduction in the time required for a repetitive task. Thus they can be used to improve the estimates in a project's budget.

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Problem No. 6

Develop an action plan with at least three levels for a project you are personally familiar with (e.g., moving away to college, planning a surprise birthday party, cleaning out a garage, getting a job, etc.). Be sure to include precedences, task durations, resource requirements (consider having resources in addition to yourself), milestones. (15 points)

Renovate garage – this is more elaborate than I expected – about half of this would be more than enough.

Task	Duration	Predecessor	Milestone
Discuss with partner	1 wk		
Preliminary agreement to proceed	0 days	1	*
Decide on features	1 wk	1	
Contact contractor and arrange visit	1 day	3	
Contractor visit, ask for bid	1 day	4	
Bid received	2 days	5	
Evaluate bid	1 day	6	
Decision made to proceed	1 day	7	
Preliminary design of cabinets	1 day	3	
Empty the garage	2 wks	2	
Contractor begins work	0 days	10	*
Demolition	2 days	11	
Structural (ceiling)	4 days	12	
Electrical	2 days	13	
Dry Wall	3 days	14	
Painting	3 days	15	
Pay contractor	0 days	16	*
Survey cabinet suppliers	2 wks		
Arrange cabinet visit	1 day	16,18	
Cabinet visit, design review	1 day	19	
Quote and design from cabinet supplier	3 days	20	
Review quote, ask for mods	2 days	21	
Revised quote received	3 days	22	
Sign contract, downpayment	0 days	23	*
Arrange delivery and installation	4 wks	24	
Installation	1 day	16,25	
Pay for cabinets	1 day	26	
Get payment from partner	1 day?	27	
Move materials into garage	3 wks	26	
Job Complete	0 days	29	*

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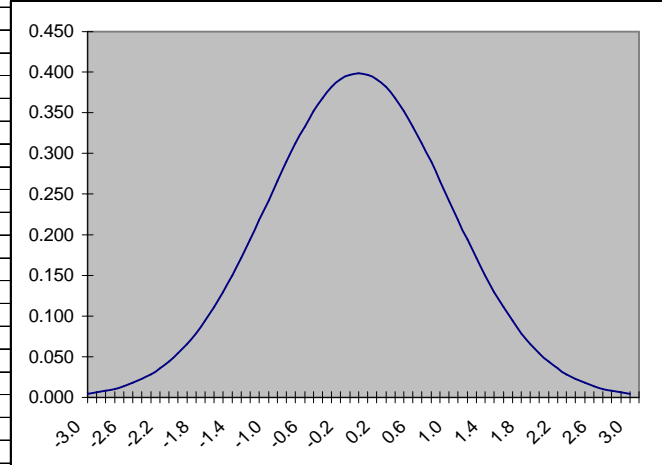
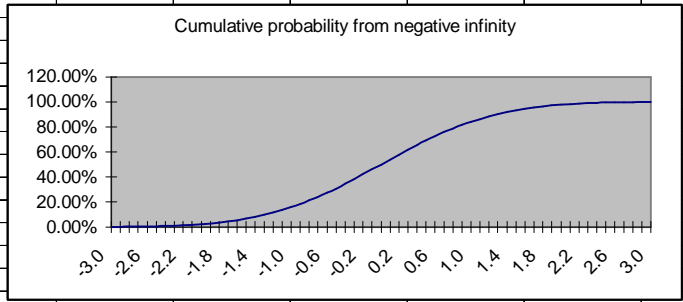
Problem No. 7

A four year financial project is forecast to have net cash inflows of \$20,000, \$25,000, \$30,000, and \$40,000 in the next four years. It will cost \$80,000 to implement the project in the current year. If we expect a rate of return of 15%, what is the Net Present Value of this project? (5 points)

Year	Cash	PV	15%
0	\$ (80,000.00)	(\$80,000.00)	
1	\$ 20,000.00	\$17,391.30	
2	\$ 25,000.00	\$18,903.59	
3	\$ 30,000.00	\$19,725.49	
4	\$ 40,000.00	\$22,870.13	
	Total	(\$1,109.49)	

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	A	B	C	D	E	F	G	H	I
1	The normal distribution								
2	Standard deviations from the mean	Cumulative probability from negative infinity							
3	-3.0	0.13%	NORMSDIST(A3)						
4	-2.9	0.19%							
5	-2.8	0.26%							
6	-2.7	0.35%							
7	-2.6	0.47%							
8	-2.5	0.62%							
9	-2.4	0.82%							
10	-2.3	1.07%							
11	-2.2	1.39%							
12	-2.1	1.79%							
13	-2.0	2.28%							
14	-1.9	2.87%							
15	-1.8	3.59%							
16	-1.7	4.46%							
17	-1.6	5.48%							
18	-1.5	6.68%							
19	-1.4	8.08%							
20	-1.3	9.68%							
21	-1.2	11.51%							
22	-1.1	13.57%							
23	-1.0	15.87%							
24	-0.9	18.41%							
25	-0.8	21.19%							
26	-0.7	24.20%							
27	-0.6	27.43%							
28	-0.5	30.85%							
29	-0.4	34.46%							
30	-0.3	38.21%							
31	-0.2	42.07%							
32	-0.1	46.02%							
33	0.0	50.00%							
34	0.1	53.98%							
35	0.2	57.93%							
36	0.3	61.79%							
37	0.4	65.54%							
38	0.5	69.15%							
39	0.6	72.57%							
40	0.7	75.80%							
41	0.8	78.81%							
42	0.9	81.59%							
43	1.0	84.13%							
44	1.1	86.43%							
45	1.2	88.49%							
46	1.3	90.32%							
47	1.4	91.92%							
48	1.5	93.32%							
49	1.6	94.52%							
50	1.7	95.54%							
51	1.8	96.41%							
52	1.9	97.13%							
53	2.0	97.72%							
54	2.1	98.21%							
55	2.2	98.61%							
56	2.3	98.93%							
57	2.4	99.18%							
58	2.5	99.38%							
59	2.6	99.53%							
60	2.7	99.65%							
61	2.8	99.74%							
62	2.9	99.81%							
63	3.0	99.87%							



NORMDIST(A44,0,1,FALSE)