Software Project Management

INF3708

Assignment 03: Due date 04 April 2018 Compulsory

ASSIGNMENT 03 - SEMESTER 1

Total Mark: 114 Marks = 100%

Mark weight: 40%

ASSIGNMENT 03	
Due date	4 April 2018
Study material	Hughes & Cotterell: Chapters 3 - 7
Total marks	114 marks
If your assignment is late, please DO NOT PHONE OR E-MAIL asking for an extension but include a note in your assignment stating the reason for the late submission and we will decide whether or not it will be marked.	

Instructions:

1. **Download and complete** this assignment and submit online in a .pdf format by performing the calculations.

2. The following unique number has to be assigned to the assignment:

UNIQUE NUMBER:
773773

3. Show all your working (calculations).

Questions on Chapter 3 - 7

Question 1 **[18 Marks]**

1.1 Distinguish between Expert judgement and Analogy as part of the software effort estimation techniques discussed in your textbook. (4)

1.2 The table below contain details about previously developed software projects/modules.

Project/ module	inputs	entity types accessed	outputs	days	euclidean distance from new
a	1	2	10	2.6	
b	10	2	1	3.9	
c	5	1	1	1.83	
d	2	3	11	3.5	
e	1	3	20	4.3	
new	7	1	7		

Table 1: for question 1

A new software project/module has 7 inputs, 1 entity type access and 7 outputs.

With the above information, answer the following questions:

a. What is the formula for calculating Euclidean distance? (2)
b. Calculate the euclidean distance for all the projects/modules from the new (10)
c. Which of the projects/modules A to E is the closest analogy in terms of Euclidean distance? (2)

Question 2 **[10 Marks]**

Controlling changes during prototyping has been identified as major problem with prototyping. Discuss the possible approach to address this according to Hughes & Cotterll (2009). (10)

Question 3 **[19 Marks]**

3.1. COCOMO is a cost estimation model that was built around equation. Provide the equation and describe the variables in Boehm's equation for calculating effort in the use of the COCOMO model. (4)

3.2. Five systems with the following estimated lines of code were identified. Using Boehm's equation, calculations and identify which year each system will be completed. Which system can be completed in three years? N:B show all your calculations. (15)

System	Line of code	System type
A	17862	Semi-detached mode
B	10762	Semi-detached mode
C	22132	Organic mode
D	7253	Embedded mode
E	6434	Embedded mode

Table 2 for Question 3: System details

COCOM Constants for calculation are made available in table 5.4 of your textbook, page

121.

QUESTION 4 **[52 Marks]**

4.1 Using the information in table 3 below do the following activities:

Activity	Duration (Working weeks)	Precedents
A	2	None
B	3	None
C	4	A
D	3	B,A
E	8	D,C
F	3	C
G	2	E
H	3	F,G

Table 3: for Question 4

4.1.1 [20]

a) Draw a network diagram **(activity-on-node)** (8)
b) Calculate **all** the node values on the nodes forward pass (earliest date) and backward pass (latest date). Note: please use the notation example in your textbook. (8)
c) What is the slack (float) time associated with the non-critical activity/ies (4)

4.1.2 [10]

a) Write down the critical path using the letters of the tasks. Calculate and write down the duration of the critical path. (6)
b) Identify all the remaining other paths and Calculate the duration. (2)
c) What is the project duration? (2)

4.2 Using your own words explain what dummy activities are. Why are they needed and possible reasons for using them. (4)

4.2.1. Assuming the duration of activity B and G in table 2, changes to 6 and 5 respectively. Draw a new network diagram (activity-on-arrow) to accommodate these changes. Clearly demonstrate the dummy activities (10)
Calculate the forward and backward pass

4.2.2 Explain in detail why dummies are used in the network diagram drawn in question 4.2.1. (4)

4.2.3 What effects does the change in activity B and G have on the project duration? Did you notice any other change on the diagram? What is the change? (4)

Questions 5 [15 Mark]

Table 3 below provides activity duration estimates for the network shown in figure 1. In the PERT network illustrated in the figure below, the **target date** for the completion of the project is **10 weeks.**

	Optimistic (a)	Most Likely (m)	Pessimistic (b)	Expected (te)	Standard Deviation (s)
A	2	4	6.50		
B	6	7	7.50		
C	1	2	5.50		
D	2.50	4.50	5.50		
E	5	6	7		

Table 4: for Question 4

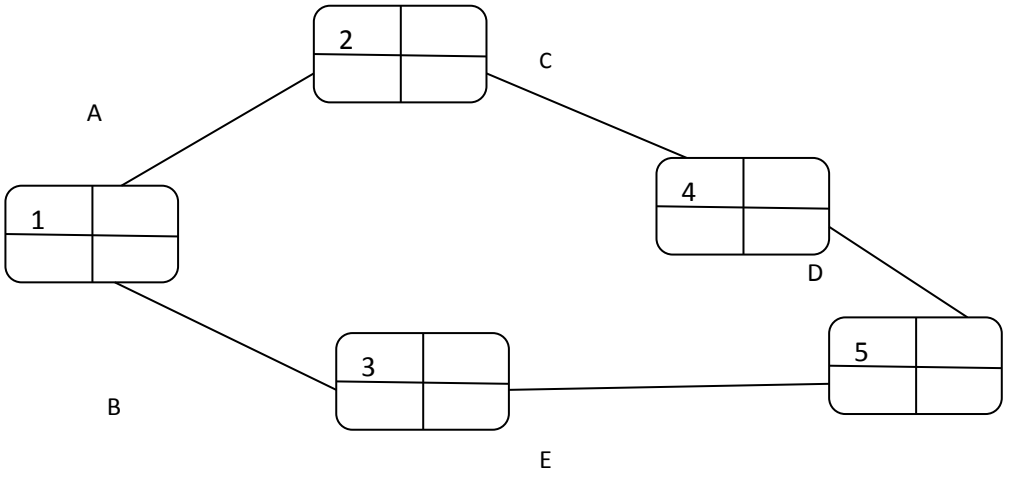

Figure 1 : Pert network for Question 4

Use the table above to calculate the following:

5.1 Calculate the Expected activity duration (te) values for all activities and use it to carry out a forward pass through the network depicted on figure 1. (2.5)

Calculate Standard Deviation (s) for all the activities (2.5)

Calculate standard deviation (s) for all the tasks of figure1 Indicate your (s) values on figure 1 also. Show all your calculations. (4)

5.2 Based on your calculation of (te), what is the project duration? State it in weeks. (2)

5.3 Calculate the Z value on the last event. (3)

5.4 According to Figure 7.8 (p.181) in your textbook, what is the probability of not meeting the target date? (1)