

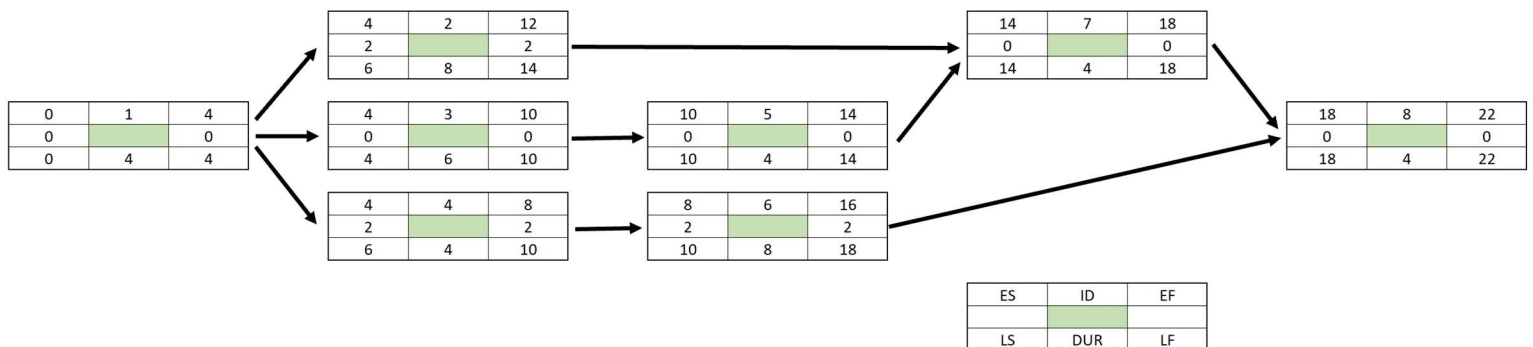
The University of Western Ontario

ELI 9200 Project Management Assignment # 3

- ✓ **Start Date:** All sections May 29, 2022 at 11:55 pm in the Owl assignment area
- ✓ **Due Date:** All sections June 19, 2022 at 11:55 pm in the Owl assignment area
- ✓ **Question 1: 2.5 marks. Question 2: 2.0 marks. Question 3: 2.5 marks**

Question 1 – Earned Value Analysis

The following data have been collected for a British healthcare IT project for 2-week reporting periods 2 through 12. Compute the SV, CV, SPI, and CPI for each period. Plot the EV and the AC on the summary Excel worksheet provided. Plot the SPI, CPI, and PCIB on the same plot with the EV and AC. But do so on a secondary axis you create. What is your assessment of the project at the end of period 12? Choose 2 of these 4 responses: On time / Late / Under budget / Over budget.



Schedule Information						Baseline PV (\$00)											
Activity / Work Package	Duration	Earliest Start	Latest Finish	Slack	Total Planned Value (\$00)	Planned Value up to the end of the Time period below											
						2	4	6	8	10	12	14	16	18	20	22	
1	4	0	4	0	8	4	4										
2	8	4	14	2	40			10	10	10	10						
3	6	4	10	0	30			10	15	5							
4	4	4	10	2	20			10	10								
5	4	10	14	0	40						20	20					
6	8	8	18	2	60					20	20	10	10				
7	4	14	18	0	20								10	10			
8	4	18	22	0	30											20	10
Total PV by period						4	4	30	35	35	50	30	20	10	20	10	
Cumulative PV by period						4	8	38	73	108	158	188	208	218	238	248	

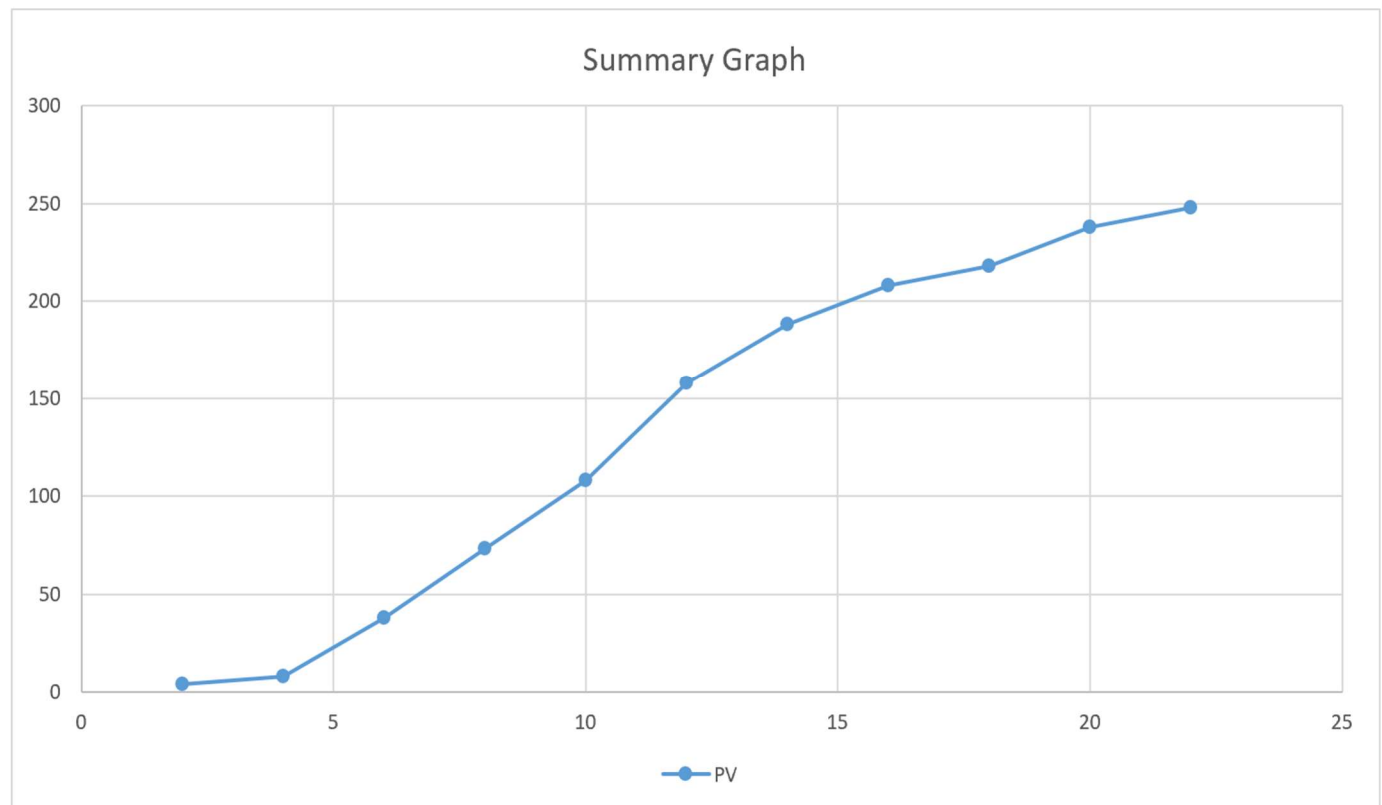
Status Report: Ending Period 2								
Task	% Complete	EV	AC	PV	CV	SV	CPI	SPI
1	50		4					
Cumulative totals			4					
Status Report: Ending Period 4								
Task	% Complete	EV	AC	PV	CV	SV	CPI	SPI
1	100		10					
Cumulative totals			10					
Status Report: Ending Period 6								
Task	% Complete	EV	AC	PV	CV	SV	CPI	SPI
1	100		10					
2	25		15					
3	33		12					
4	0		0					
Cumulative totals			37					
Status Report: Ending Period 8								
Task	% Complete	EV	AC	PV	CV	SV	CPI	SPI
1	100		10					
2	30		20					
3	60		25					
4	0		0					
Cumulative totals			55					
Status Report: Ending Period 10								
Task	% Complete	EV	AC	PV	CV	SV	CPI	SPI
1	100		10					
2	60		30					
3	100		40					
4	50		20					
5	0		0					
6	30		24					
Cumulative totals			124					
Status Report: Ending Period 12								
Task	% Complete	EV	AC	PV	CV	SV	CPI	SPI
1	100		10					
2	100		50					
3	100		40					
4	100		40					
5	50		30					
6	50		40					
Cumulative totals			210					



Period	SPI	CPI	PCIB
2			
4			
6			
8			
10			
12			

$SPI = EV/PV$
 $CPI = EV/AC$
 $PCIB = EV/BAC$

Period	2	4	6	8	10	12	14	16	18	20	22
(\$00) PV	4	8	38	73	108	158	188	208	218	238	248
AC											
EV											
SPI											
PCI											
PCIB											



Question 2 – Network Diagrams & PERT

We are remodeling the Grad Club in Middlesex College. Some questions are being asked about our ability to possibly finish a bit early. Complete the analysis answering the questions below.

Activity	Preceding activity	Best A	Likely M	Worst B	Time est. (days) $t_E = (A + (4M) + B) / 6$	St. Dev $\sigma_{t_E} = (B - A) / 6$	Variance $\sigma_{t_E}^2$
a. Rough in walls	-	11	12	13			
b. Build the bar	a	4	6	11			
c. run HVAC	-	12	15	30			
d. rough in electrical	b,c	12	15	20			
e. complete flooring	a	7	12	22			
f. get licenses	e	2	17	19			
g. install fire alarm	c,d,e	13	17	19			
h. deliver kitchen equip	e,f	9	14	19			
i. exposed ceiling reviews	c,g	11	13	20			
j. build stage	g,h	12	13	16			
k. sound system	j,i	9	13	23			

- Identify any redundant links still showing and cancel them
- Identify the critical path
- Identify the slack for each element
- Identify the most and least sensitive element
- Identify the predicted project duration (Total T_E for critical path)
- Z is the probability of meeting schedule duration found in the statistical table below, and defined by the relationship:

$$Z = (T_s - T_E) / \text{SQRT}(\sum \sigma_{t_E}^2)$$

If T_s (Time scheduled) is 83 days, then what is the likelihood that we finish the project on time assuming T_E is our predicted project duration? Express your response as a percentage chance. (Tip: Round up all t_E duration calculations to one decimal place throughout the problem).

Z Value	Probability	Z Value	Probability
-2	0.02	2	0.98
-1.5	0.07	1.5	0.93
-1	0.16	1	0.84
-0.7	0.24	0.7	0.76
-0.5	0.31	0.5	0.69
-0.3	0.38	0.3	0.62
-0.1	0.46	0.1	0.54

Question 3 – Resource Levelling

Compute the early, late, and slack times for the activities in the network that follows, assuming a time constrained network. Which activities are critical? What is the time constrained project duration?

Note that in the schedule resource load chart the time constrained scheduling interval (ES through LF) has been shaded. Any resource scheduled beyond the shaded area will delay the project.

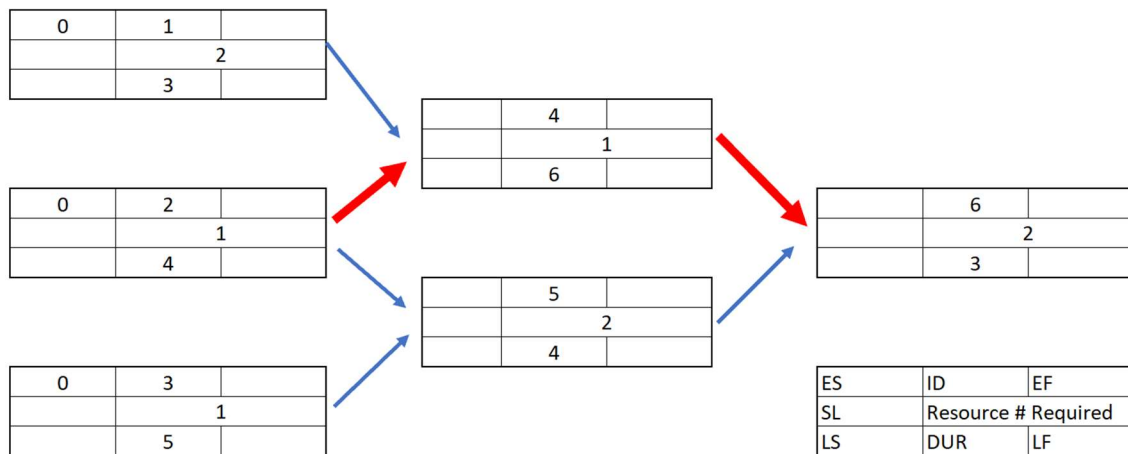
Assume you have only 3 resources and you are using software that schedules projects by the parallel method and following heuristics. Schedule only one period at a time!

Minimum slack
Smallest duration
Lowest Identification number

Keep a log of each activity change and update you make each period – e.g., period 0-1, 1-2, 2-3, etc. (Use a format similar to the one on Page 267 in your text book). The log should include any changes or updates in ES, LF, and slack times each period, activities scheduled, and activities delayed. (Hint: Remember to maintain the technical dependencies of the network.) Use the resource load chart to assist you in scheduling *See figures 8.4 and 8.5 in your text book)

List the order in which you schedule activities of the project. Which activities of your schedule are now critical?

Recompute your slack for each activity, given your new schedule. What is the slack for activity 1? 4? 5?



Scheduled Resource Load Chart with ES and Slack updates

ID	RES	DUR	ES	LF	SL	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2	3	0	4	1																
2	1	4	0	4	0																
3	1	5	0	6	1																
4	1	6	4	10	0																
5	2	4	5	10	1																
6	2	3	10	13	0																
Resources Scheduled																					
Resources Available						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3



General submission Requirements

Complete all your work in the Excel workbook templates provided for Question 1. For Question 2, create another tab in the same Excel workbook for your network diagram and show your calculations required to complete this question. You should start by recreating the chart in the question. Please show your responses A through F for Question 2 in Excel as well. For Question 3, answer directly in the Excel workbook tab created for you, adding snippets from Word should you so choose.

Do not .pdf your submission. Provide a native excel workbook so the TA can review the details of your work.

Please note that you require materials from lessons 6 through 9 in completing this assignment.