

Critical path procedure essay sample



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1. Develop a list of the activities that make up the project. 2. Determine the immediate predecessor(s) for each activity in the project. 3. Estimate the completion time for each activity. For example:

Activity Immediate Predecessor Time

A – 3

B – 1

C – 2

D A, B, C 4

E C, D 5

F A 3

G D, F 6

H E 4

4. Draw a project network with nodes and arcs depicting the activities and immediate predecessors listed in steps 1 and 2. Please see problem 4, 7, and 8 below for an example of a network with arcs. 5. Prepare the outline of the activity schedule with column and row titles as shown below. 6. Use the project network and the activity times to determine the earliest start and then the earliest finish time for each activity by making a forward pass through the network. 7. The earliest start time for the first activity(s) in a network is zero (0). The earliest finish time for the first activity(s) in a network is the activity time for that activity. 8. The earliest start time for an activity with one predecessor is the earliest finish time for the predecessor. The earliest finish time for this activity is the earliest start time plus the activity time for the activity. 9. The earliest start time for an activity with two or more predecessors is the maximum of the earliest finish times for all of

the predecessors for that activity. 10. The earliest finish time for the last activity in the project identifies the project completion time.

Activity Schedule | Activity| Earliest| Earliest| Latest| Latest| | Critical|

Activity| Time| Start| Finish| Finish| Start| Slack| Path| A| 4|

0| 4| 4| 0| 0| X|

B| 6| 0| 6| 7| 1| 1| |

C| 2| 4| 6| 7| 5| 1| |

D| 6| 4| 10| 10| 4| 0| X|

E| 3| 6| 9| 10| 7| 1| |

F| 3| 6| 9| 15| 12| 6| |

G| 5| 10| 15| 15| 10| 0| X|

11. Use the project completion time identified in step 10 as the latest finish time for the last activity and make a backward pass through the network to identify the latest start and latest finish time for each activity. 12. The latest finish time for an activity that has one succeeding activity is the latest start time for that succeeding activity. 13. The latest finish time for an activity that has two or more succeeding activities is the minimum of the latest start times for all of the succeeding activities. 14. Use the difference between the latest start time and the earliest start time for each activity to determine the slack time for each activity (i. e., slack time = latest start time – earliest start time). 15. Find the activities with zero slack; these are the activities on the critical path. 16. Prepare the formulas to calculate the earliest start, earliest finish, latest finish, latest start, slack, and critical activity cells. With these

formulas in place, you can change any of the activity times and the related cells will reflect the change. Critical Path Problems

1. Construct a project network for the following project. The project is completed when activities F and G are both complete.

Activity ABCDEFG

Immediate Predecessor – A C, B C, B D, E

Assume that the project has the following activity times (in months):

Activity ABCDEFG

Time 4 6 2 6 3 3 5

- a. Draw a project network.
- b. Develop the activity schedule for the project.
- c. Can the project be completed in 1.5 years?

2. Embassy Club Condominium, located on the west coast of Florida, is undertaking a summer renovation of its main building. The project is scheduled to begin May 1, and a September 1 (17-week) completion date is desired. The condominium manager identified the following renovation activities and their estimated times.

Activity Immediate Predecessor Time

A – 3

B – 1

C – 2

D A, B, C 4

E C, D 5

F A 3

G D, F 6

H E 4

- d. Draw a project network.
- e. Develop the activity schedule for the project.
- f. What are the critical activities?
- g. What activity has the most slack time?
- h. Will the project be completed by September 1?

3. Colonial State College is considering building a new multipurpose athletic complex on campus. The complex would provide a new gymnasium for intercollegiate basketball games, expanded office space, classrooms, and intramural activities. The following activities would have to be undertaken before construction can begin.

Activity	Description	Immediate Predecessor	Time
A	Survey building site	-	6
B	Develop initial design	-	8
C	Obtain board approval	A, B	12
D	Select architect	C	4
E	Establish budget	C	6
F	Finalize design	D, E	15
G	Obtain financing	E	12
H	Hire contractor	F, G	8

- a. Draw a project network.
- b. Identify the critical path.
- c. Develop the activity schedule for the project.
- d. Does it appear reasonable that construction of the athletic complex could begin one year after the decision to begin the project with the site survey and initial design plans? e. What is the expected completion time for the project?

4. Hamilton County Parks is planning to develop a new park and recreational area on a recently purchased 100-acre tract. Project development activities include clearing playground and picnic areas, constructing roads, constructing a shelter house, purchasing picnic equipment, and so on. The following network and activity times (in weeks) are being used in the planning, scheduling, and controlling of this project.

D H

A

Start C E I Finish

B F G

Activity ABCDEFGHI

Time 9 6 6 3 0 3 2 6 3

- a. What is the critical path for this network?
- b. Show the activity schedule for this project?
- c. The park commissioner would like to open the park to the public within six

months from the time the work on the project is started. Does the opening date appear to be feasible?

5. Building a backyard swimming pool consists of nine major activities. The activities, their immediate predecessors, and the activity times are shown. Develop the project network.

Activity ABCDEFGHI

Immediate

Predecessor— — A, B A, B B C D D, F E, G, H Activity Times 5 4 6 9 4 2 8 8 4

- What is the critical path for this network?
- Show the activity schedule for this project?
- Can the project be completed in 25 or fewer days?

6. The manager of the Oak Hills Swimming Club is planning the club's swimming team program. The first team practice is scheduled for May 1. The activities, their immediate predecessors, and the activity times (in weeks) are as follows:

Immediate

Activity Description Predecessor Time (Weeks)

A Meet with the board — 1 B Hire coaches A 6

C Reserve pool A 4

D Announce program B, C 2 E Meet with coaches B 3

F Order team suits A 2 G Register swimmers D 2

H Collect fees G 2 I Plan first practice E, H, F 1

d. Develop a project network.

e. Develop an activity schedule.

f. What are the critical activities and what is the project completion time?

7. Norton Industries is installing a new computer system. The activities, the activity times, and the project network are as follows:

ActivityTimeActivity Time

A 3 E 4

B 6 F 3

C 2 G 9

D 5 H 3

A C EF

Start D HFinish

B G

ActivityTime (Weeks)

A 3

B 6

C 2

D 5

E 4

F 3

G 9

H 3

- a. Develop an activity schedule for this project.
- b. What is the critical path?
- c. What is the project completion time?

8. Consider the following project network and activity times (in days).

ACE

Start Finish

BDFG

Activity ABCDEFG

Time 3 2 5 5 6 2 2

- a. Prepare an activity schedule for this project.
- b. Show the critical path and the expected completion time for the project.

9. Office Automation, Inc., developed a proposal for introducing a new computerized office system that will improve word processing and interoffice communications for a particular company. Contained in the proposal is a list of activities that must be accomplished to complete the new office system project. Use the following relevant information about the activities.

Immediate Activity Description Predecessor Time (Weeks) A Plan Needs – 10

B Order equipment A 8 C Install equipment B 10 D Set up training lab A 7 E

Do training course D 10 F Test system C, E 3

- g. Develop a project network.
- h. Develop an activity schedule.
- i. What are the critical activities, and what is the expected project completion time?

10. Mighty Morphin Project

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Prede- Normal

Activity cessor Time

1. Collect Information None 5
2. Develop Prototypes 1 10
3. Develop Mktg Program 1 8
4. Prepare Instructions 2 7
5. Design Packaging 2 9
6. President's Approval 3 3
7. Train Sales Force 4, 5 2
8. Develop Info Guide 4, 6 8
9. Hire Actors 3 8
10. Mfr Display Racks 6, 5 12
11. Begin Roll Out 7, 8, 9, 10 0