Project crashing

Project crashing

- It is common in project management that additional resources are used to either speed up some activities to get the project back on schedule or to reduce the project completion time.
- Crashing an activity refers to the speeding up or shortening of the duration of an activity by using additional resources. These include overtime, hiring temporary staff, renting more efficient equipment, and other measures.

Project crashing

- Project crashing refers to the process of shortening the duration of the project by crashing the duration of a number of activities.
- Since it generally results in an increase of the overall project costs, the challenge faced by the project manager is to identify the activities to crash and the duration reduction for each activity such that as the project crashing is done in the least expensive manner possible.

Project crashing

- The normal time refers to the estimated activity duration used with CPM or PERT in the computation of earliest (latest) start or finish times.
- The normal cost refers to the activity cost under the normal activity time.
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Project crashing

- The crash time refers to the shortest possible time to complete an activity with additional resources.
- The crashing cost refers to the activity cost under the crashing activity time. This relationship is assumed to be linear. Hence, for each activity a crash cost per period (e.g.,per week) can be derived as follows:
- crash cost per period = (Crash cost - Normal Cost)/ (Normal time - Crash time)

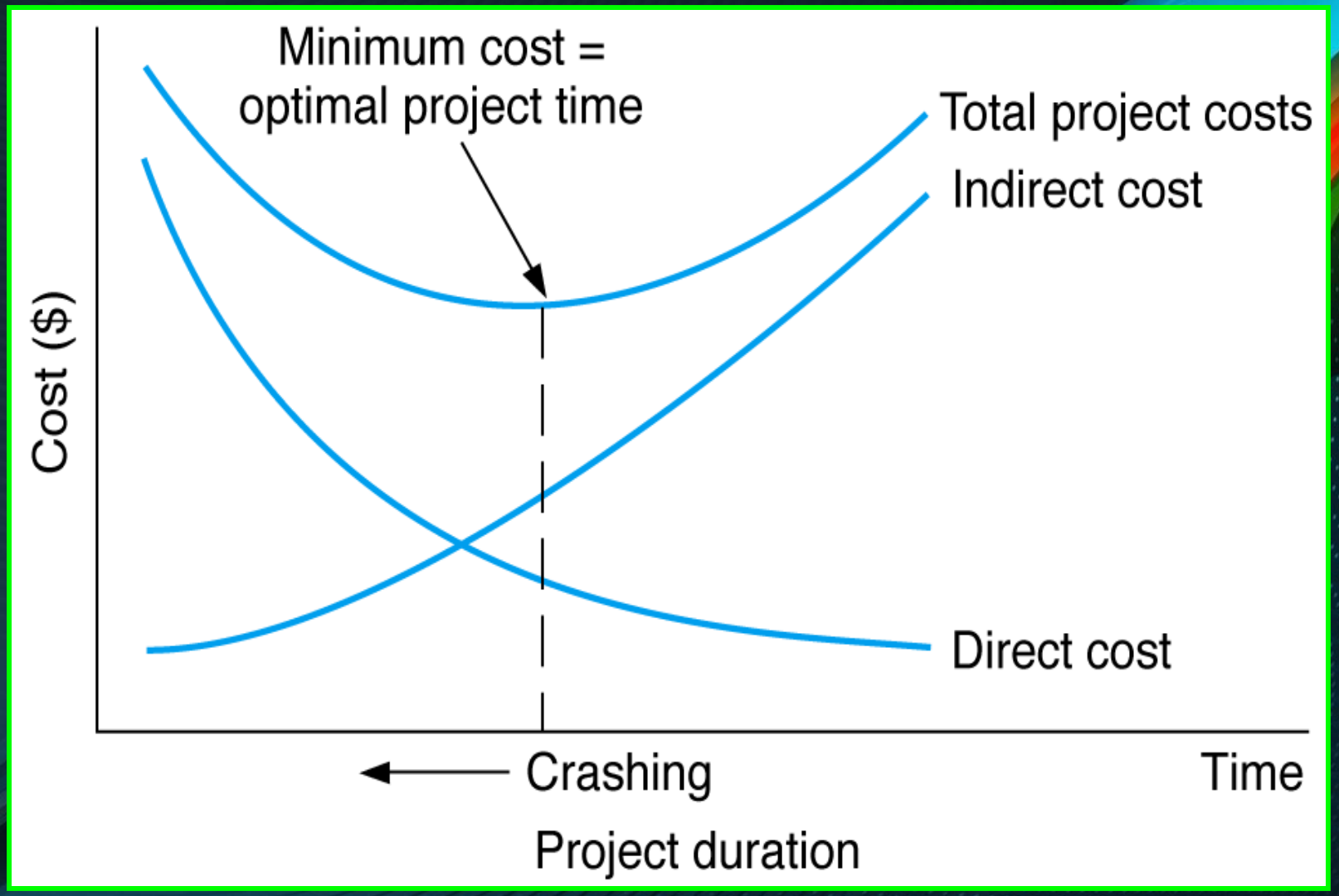
Project crashing

- the cost to crash per period assumes that the relationship between adding more money to the activity and reducing the time is linear. Spend half of the money, and get half the time reduction, spend _ of the money and get _ time reduction. This is not always true in practice, but works alright for a rough planning technique

THE GENERAL RELATIONSHIP OF TIME AND COST

- Crashing costs increase as project duration decreases.
- Indirect costs increase as production duration increases.
- Reduce project length as long as crashing costs are less than indirect costs.

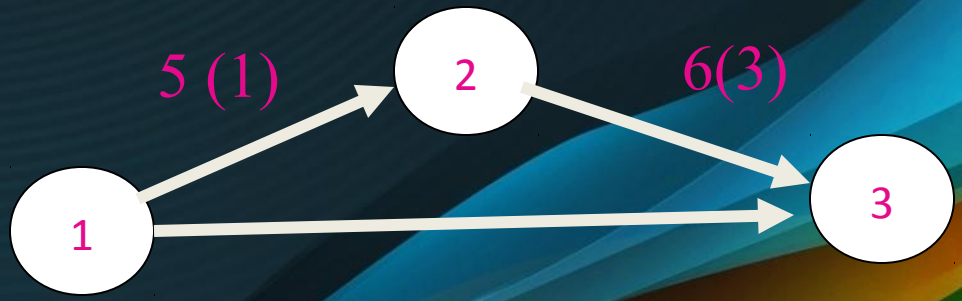
Conti….


Minimum cost =
optimal project time
Total project costs
Indirect cost
Direct cost
Cost ($)
Crashing
Time
Project duration

Conti….

- The objective of crashing was to reduce the scheduled completion time to reap the results of the projects sooner.
- However, there may be other reasons for reducing project time.
- There also may be direct financial penalties for not completing a project on time.

What criteria should it be based on when deciding to crashing critical times?



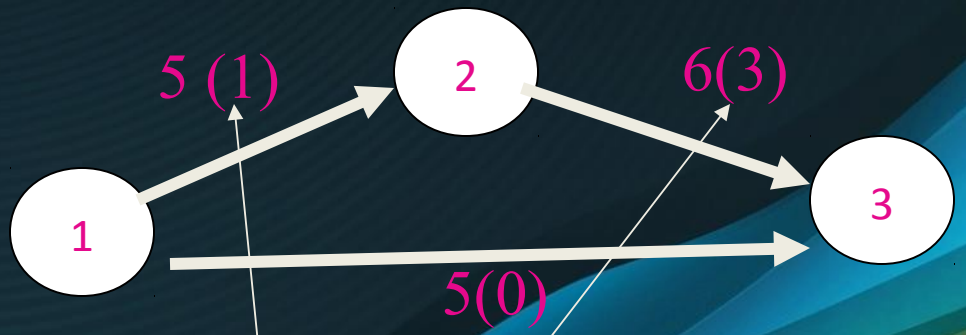
The critical path is 1-2-3, the completion time =11

How? Path: 1-2-3 = 5+6=11 weeks

Path: 1-3 = 5 weeks

Now, how many days can we “crash” it?

Conti…

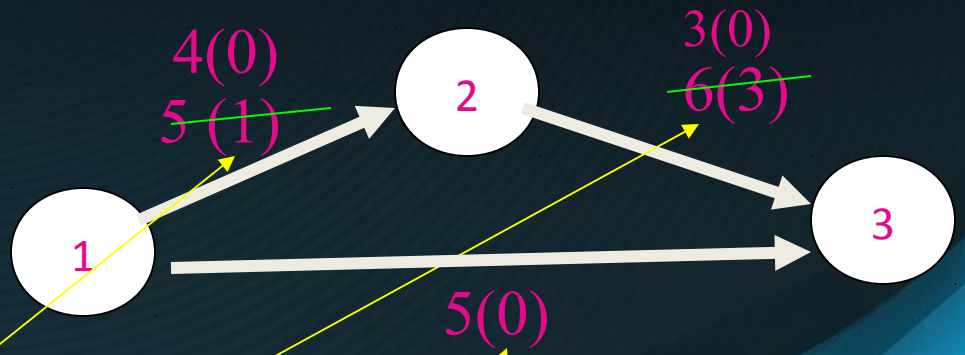


- The maximum time that can be crashed for:

  Path 1-2-3 = 1 + 3 = 4

  Path 1-3 = 0

- Should we use up all these 4 weeks?



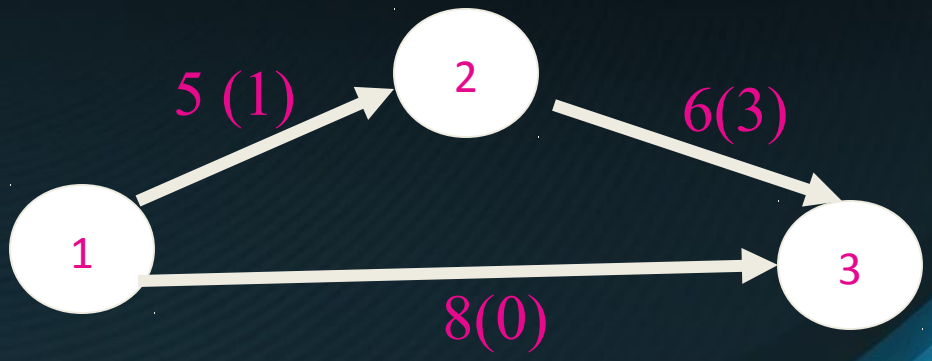
- If we used all 4 days, then path 1-2-3 has (5-1) + (6-3) = 7 completion weeks

  Now, we need to check if the completion time for path 1-3 has lesser than 7 weeks (why?)

  Now, path 1-3 has (5-0) = 5 weeks

  Since path 1-3 still shorter than 7 weeks, we used up all 4 crashed weeks

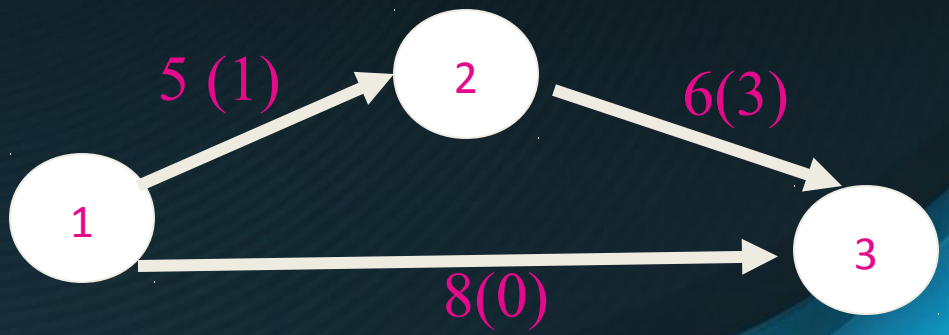
- Question: What if path 1-3 has, say 8 weeks completion time?



- Now, we cannot use all 4 days (Why?)
  Because path 1-2-3 will not be critical path anymore
  path 1-3 would now has longest hour to finish

- Rule: When a path is a critical path, it will not stay as a critical path

- So, we can only reduce the path 1-2-3 completion time to the same time
- as path 1-3. (HOW?)



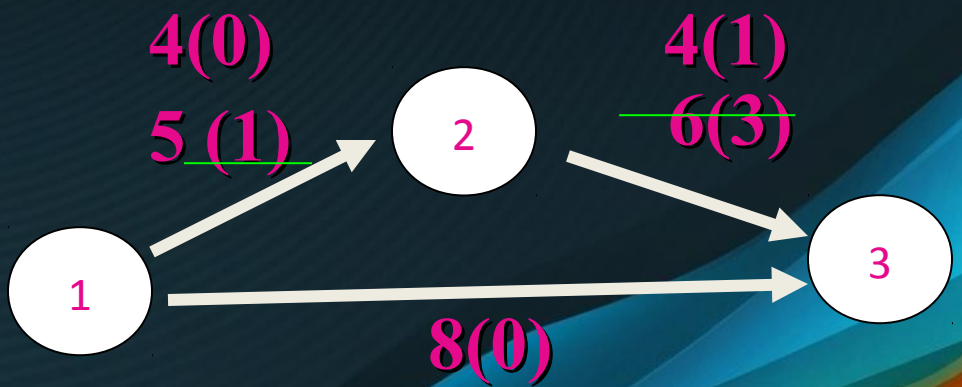
- We can only reduce total time for path 1-2-3 = path 1-3,

that is 8 weeks

If the cost for path 1-2 and path 2-3 is the same then

We can random pick them to crash so that its completion

Time is 8 weeks



OR