# Float and the Critical Path Exercise

This exercise supplements what you learned in your PMP prep book, in the "Schedule" chapter. You can use it for additional practice with a project's critical path.

## Exercise

Use the data in this table to answer the questions that follow. For step two, you will need to draw the network diagram, and in each box representing a task, place the correct ES, EF, LS and LF. Then for step five, you will also need to redraw the basic network diagram for step. You do not need to place the "start" and "finish" values in the activity boxes for step five.

Write your answers in your Exercise Notebook.

| Activity | Preceding Activity | Estimate in Months |
|---|---|---|
| Start | | 0 |
| D | Start | 4 |
| A | Start | 6 |
| F | D, A | 7 |
| E | D | 8 |
| G | F, E | 5 |
| B | F | 5 |
| H | G | 7 |
| C | H | 8 |
| End | C, B | 0 |

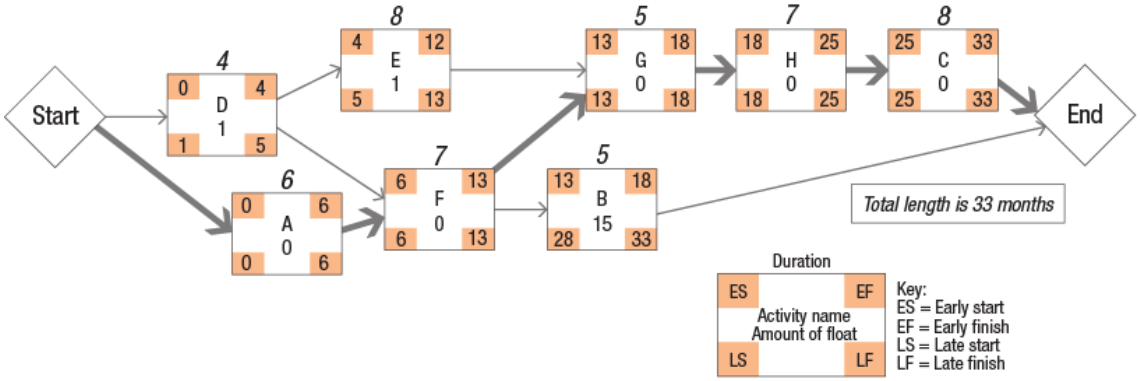
1. What is the duration of the critical path in months?
2. What is the float of activity B?
3. What is the float of activity E?
4. What is the float of activity D?
5. To shorten the length of the project, the sponsor has offered to remove the work of activity E from the project, making activity D the predecessor to activities G and F. What will be the effect?

## Answer

1. The critical path (for project duration) is 33 months.

| Path | Duration |
|---|---|
| Start, D, E, G, H, C, End | 32 |
| Start, D, F, G, H, C, End | 31 |
| Start, D, F, B, End | 16 |
| Start, A, F, G, H, C, End | 33 |
| Start, A, F, B, End | 18 |

2. The float of activity B is 15 months, per the following diagram.




3. The float of activity E is one month. Once you have finished calculated ES, EF, LS and LF, all the other answers are usually quick. Just look at the diagram to see the float of any activity.

   Watch out here for the float of activity E. The project must be completed by the end of month 33. Activity E must be completed before activities G, H, and C can start. So, the late finish for E is 33 – 8 – 7 – 5, or 13.

   Activity E must be completed after activity D. So, the early finish is 4 + 8, or 12.
   Float = Late finish – Early finish, so 13 – 12 = 1.

4. The float of activity D is one month.

   Now let's look at using a calculation to determine the float for activity D:

   - The project must be completed by the end of month 33.
   - Activity D must be completed before activities E, F, G, H, C, and B can start.
   - Looking backward through the dependencies, the late finish is 33 – 8 – 7 – 5, but then we run into a problem. Normally we would go along the critical path, but look at activities E and F.
   - Activity E is longer than activity F, so we must go along the longest duration path, from activity G to activity E, making the late finish 33 – 8 – 7 – 5 – 8, or 5.

   Early finish is easier. There are no predecessors, so the early finish is the end of month 4.

   Float = 5 – 4, or 1 month.

5. Removing the work of activity E will have no effect on the critical path. The paths are now:

| Path | |
|---|---|
| Start, D, G, H, C, End | 24 |
| Start, D, F, G, H, C, End | 31 |
| Start, D, F, B, End | 16 |
| Start, A, F, G, H, C, End | 33 |
| Start, A, F, B, End | 18 |