

ADVANCED PROBLEM

12 Assume the network and data that follow:

ACTIVITY	NORMAL TIME (WEEKS)	NORMAL COST	CRASH TIME (WEEKS)	CRASH COST	IMMEDIATE PREDECESSORS
A	2	\$50	1	\$70	—
B	4	80	2	160	A
C	8	70	4	110	A
D	6	60	5	80	A
E	7	100	6	130	B
F	4	40	3	100	D
G	5	100	4	150	E, F

- Construct the network diagram.
- Indicate the critical path when normal activity times are used.
- Compute the minimum total direct cost for each project duration based on the cost associated with each activity. Consider durations of 13, 14, 15, 16, 17, and 18 weeks.
- If the indirect costs for each project duration are \$400 (18 weeks), \$350 (17 weeks), \$300 (16 weeks), \$250 (15 weeks), \$200 (14 weeks), and \$150 (13 weeks), what is the total project cost for each duration? Indicate the minimum total project cost duration.

CASE: THE CAMPUS WEDDING (A)

● ● ● On March 31 of last year, Mary Jackson burst into the family living room and announced that she and Larry Adams (her college boyfriend) were going to be married. After recovering from the shock, her mother hugged her and asked, "When?" The following conversation resulted:

Mary: April 22.

Mother: What!

Father: The Adams-Jackson wedding will be the social hit of the year. Why so soon?

Mary: Because on April 22 the cherry blossoms on campus are always in full bloom! The wedding pictures will be beautiful.

Mother: But honey, we can't possibly finish all the things that need to be done by then. Remember all the details that were involved in your sister's wedding? Even if we start tomorrow, it takes a day to reserve the church and reception hall, and they need at least 17 days' notice. That has to be done before we can start decorating the church, which takes three days. An extra \$100 contribution on Sunday would probably cut that 17-day notice to 10 days, though.

Father: Ugh!

Mary: I want Jane Summers to be my maid of honor.

Father: But she's in the Peace Corps, in Guatemala, isn't she? It would take her 10 days to get ready and drive up here.

Mary: But we could fly her up in two days, and it would cost only \$500. She would have to be here in time to have her dress fitted.

Father: Ugh!

Mother: And catering! It takes two days to choose the cake and table decorations, and Jack's Catering wants at least 10 days' notice prior to the rehearsal dinner (the night before the wedding).

Mary: Can I wear your wedding dress, Mom?

Mother: Well, we'd have to replace some lace, but you could wear it, yes. We could order the lace from New York when we order the material for the bridesmaids' dresses. It takes eight days to order and receive the material. The pattern needs to be chosen first, and that would take three days.

Father: We could get the material here in five days if we paid an extra \$25 to airfreight it.

Mary: I want Mrs. Watson to work on the dresses.

Father: But she charges \$120 a day!

Mother: If we did all the sewing, we could finish the dresses in 11 days. If Mrs. Watson helped, we could cut that down to six days, at a cost of \$120 for each day less than 11 days.

Mary: I don't want anyone but her.

Mother: It would take another two days to do the final fitting. It normally takes two days to clean and press the dresses, but that new cleaner downtown could do them in one day if we pay the \$30 charge for express service.

Father: Everything should be completed by rehearsal night, and that's only 21 days from now. I bet that will be a busy day.

Mother: We've forgotten something. The invitations.