

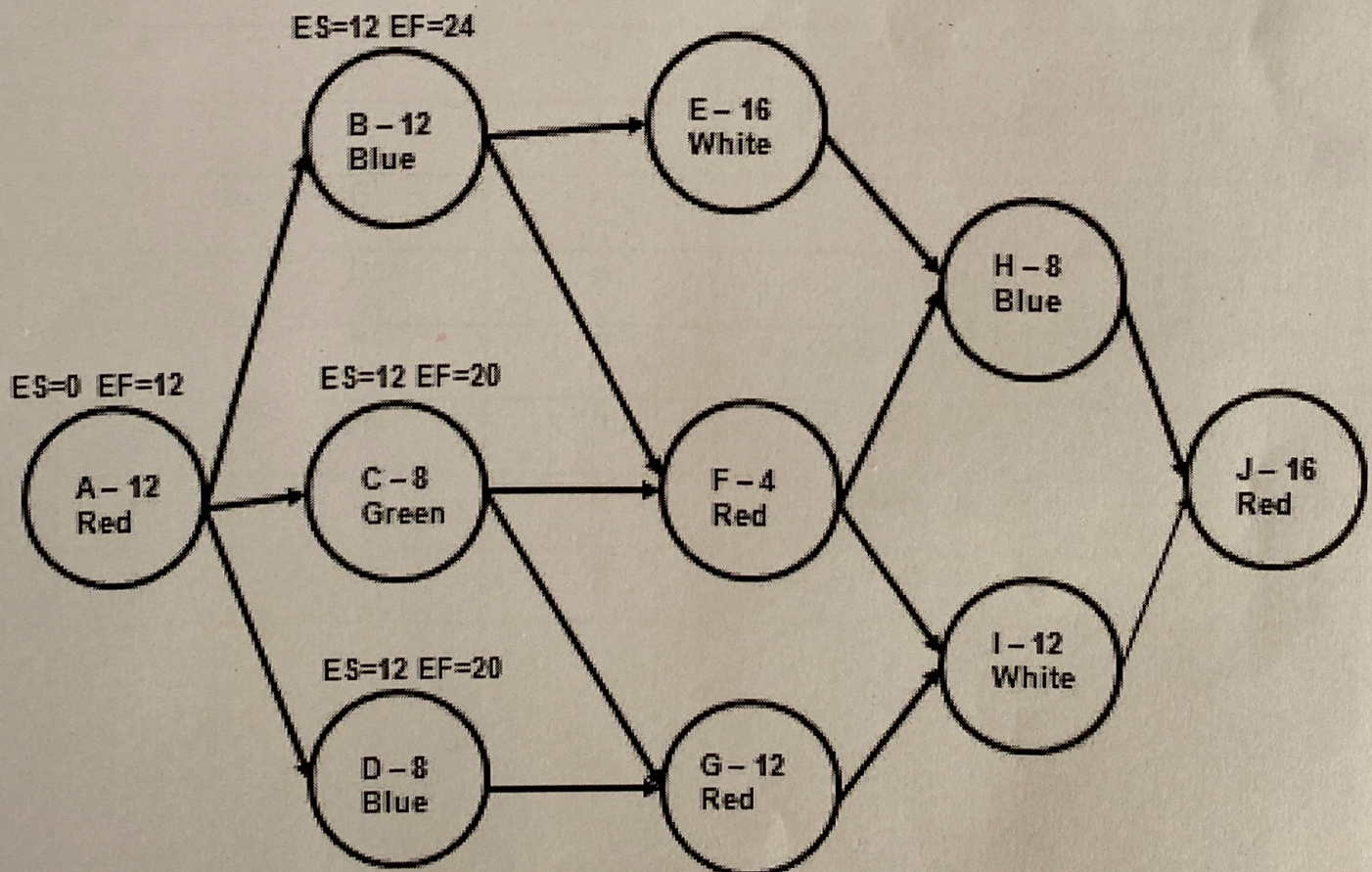
Critical Chain Project Management

1. The activities precedence relationship and resource requirement of a project are given as below. This project has six persons to perform all activities and the assignment of the resources is shown in the table.

| Activities | Predecessor | Time | Resource requirement |
|------------|-------------|------|----------------------|
| A | ---- | 2 | Ryan |
| B | A | 15 | Carly |
| C | A | 18 | Ryan |
| D | A | 13 | Laurn |
| E | A | 18 | Connor |
| F | D | 15 | Ryan |
| G | B,C,F | 10 | Dawn |
| H | E,G | 5 | Kevin |

Develop the critical chain for the above network. Insert feeder buffer, and project buffer and determine the project completion time.

2. Consider the project network given below. Develop a critica chain for the given network.



3. Consider the data about project activities given in the table below. Develop the critical chain and indicate the feeder buffer and project buffer in the critical chain.

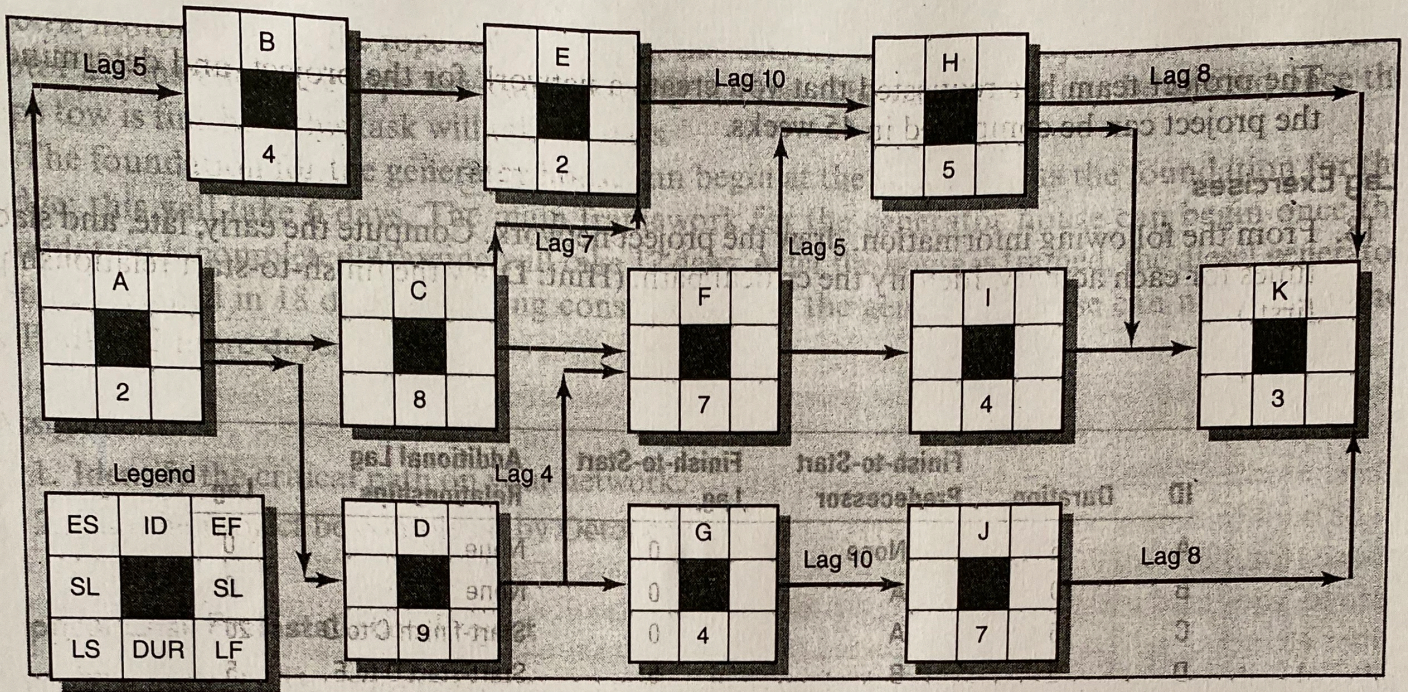
| Activity | Predecessor | Duration | Resources |
|----------|-------------|----------|---------------------|
| A | -- | 2 | Engineer |
| B | A | 3 | Marketing |
| C | -- | 3 | Engineer, Marketing |
| D | C | 2 | Finance |
| E | D,J | 3 | Marketing, Finance |
| F | E,B | 2 | Engineer |
| G | F | 2 | Production |
| H | -- | 4 | Marketing |
| J | H | 2 | Finance |

Assume the size of feeder buffer, and project buffer as 50% length of non-critical path and critical chain respectively.

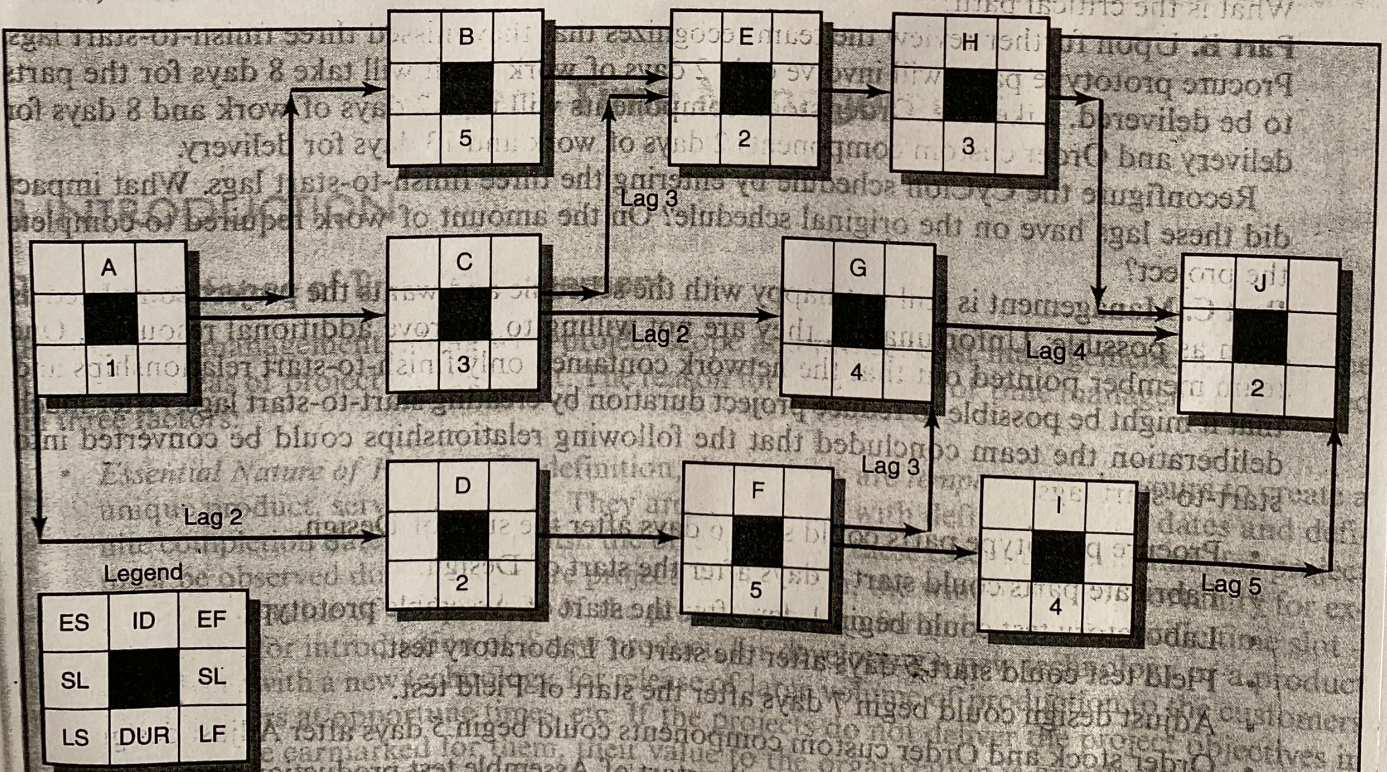
4. Given the following information's, compute early, late and slack times for the project network.

| ID | Duration | Finish-to-start Predecessor | Finish-to-start Lag | Additional Lag relationship | Lag |
|----|----------|-----------------------------|---------------------|-----------------------------|-----|
| A | 2 | None | 0 | None | 0 |
| B | 4 | A | 0 | None | 0 |
| C | 6 | A | 0 | Finish-Finish C to F | 7 |
| D | 8 | A | 0 | None | 0 |
| E | 18 | B | 0 | Finish-Finish E to G | 9 |
| | | C | 10 | | |
| F | 2 | D | 0 | None | |
| G | 5 | F | 0 | Start-start G to H | 10 |
| H | 5 | None | 0 | None | 0 |
| I | 14 | E | 0 | Finish-Finish I to J | 5 |
| J | 15 | G, H | 0 | None | 0 |

49 Given the information in the following lag exercises, compute the early, late, and slack times for the project network. Which activities on the critical path have only the start or finish of the activity on the critical path?



50 Given the network below, compute the early, late, and slack time for each activity.



The ES for Activity C is _____ The slack for the start of Activity G is _____ The slack for the finish of Activity H is _____
 The LS for Activity E is _____ The slack for the start of Activity B is _____ The slack for the finish of Activity F is _____
 The LS for Activity G is _____ The slack for the start of Activity E is _____ The slack for the finish of Activity G is _____

7. Figure 1, shows the usual (FS=0) network diagram for a project and Figure 2 shows the corresponding time-scaled network, which is a form of Gantt chart wherein dependencies among the activities are shown explicitly.

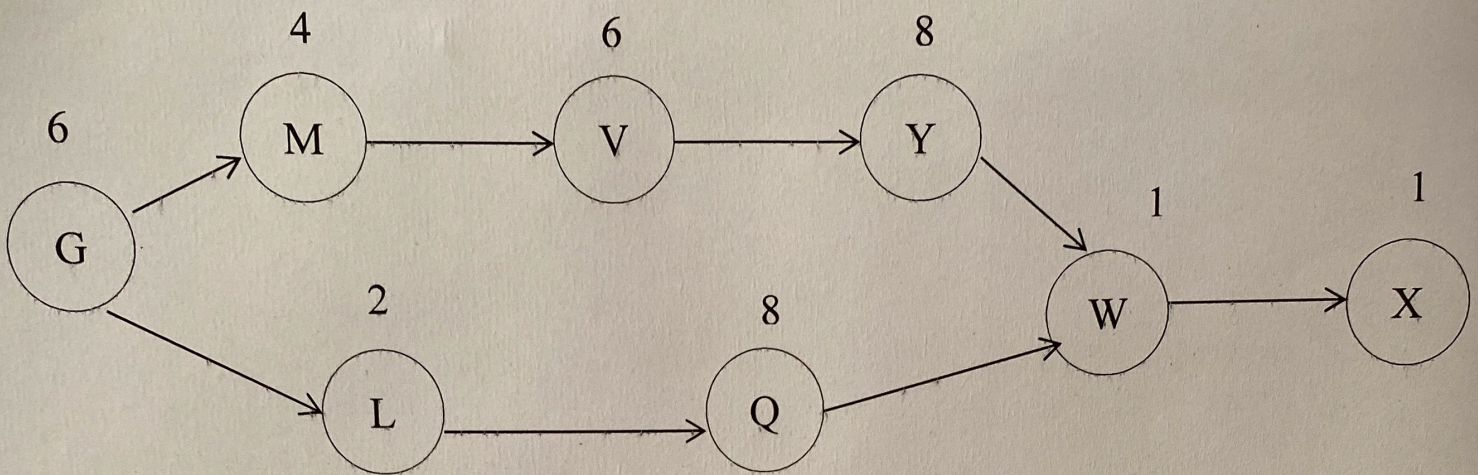


Figure 1: AON diagram for the project

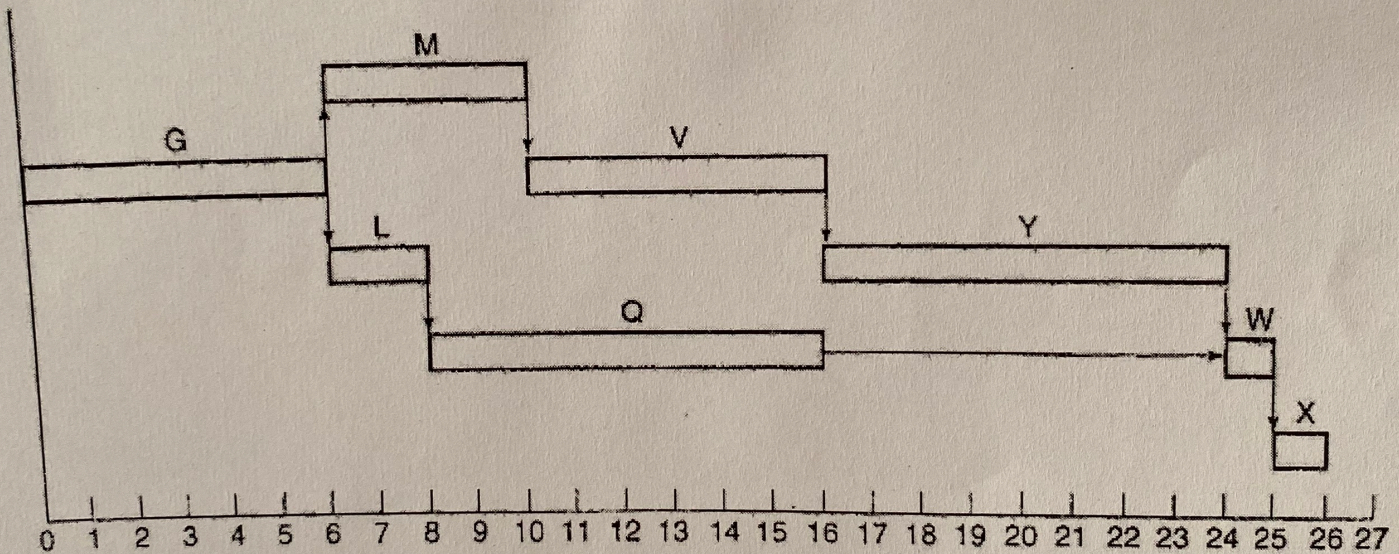


Figure 2: Time-scaled network for the project

After developing the preliminary schedule the project completion time was found 26 days as shown in figure 2. The project sponsor was not happy with the schedule and the project completion date. Project sponsor wants to complete the project as soon as possible. However, project sponsor was not willing to approve additional resources to complete the project sooner.

Once again project team met and decided to replace some finish to start lags with other lags. After much deliberation the team concluded that the following relationships could be converted into other lags:

- Activity L can begin 3 days after Activity G begins, but it cannot be finished until G is also finished.
- Activity Y can begin 2 days after Activity V begins, but it cannot be completed until at least 6 days after V is completed.
- Activity W can begin 5 days after Activity Y begins, but it cannot be completed until Y is also completed.
- Activity X cannot be started until at least 1 day after Activity W is completed.