Solution File of lecture No 5-6

Solution No 1:

Roads have the same as analogy as that of branches in network flow diagram.

Intersections have the same as analogy as that of nodes in network flow diagram.

Vehicles have the same as analogy as that of flow in network flow diagram.

Solution No 2:

Dummy activity and its use:

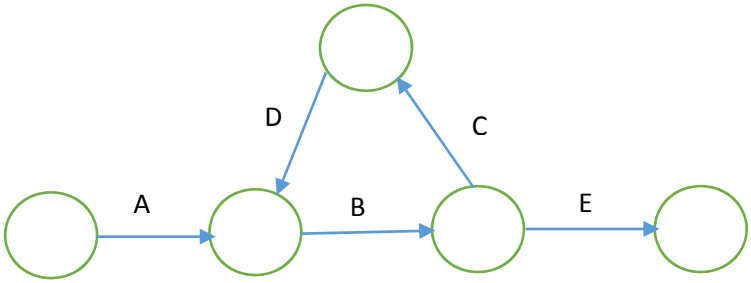
In large networks the easiest way to represent some precedence relationship is by introducing the dummy activity. It does not consume any time or any kind of resource. It makes the calculation we have to do easier to follow and maintain the correct sequence of activities.

Dummy activity is introduced in a network under the following situations.

a) It is created to make activities with common starting and finishing events distinguishable.
b) To identify and maintain the proper precedence relationship between activities those are not connected by events.

Looping Error in Network:

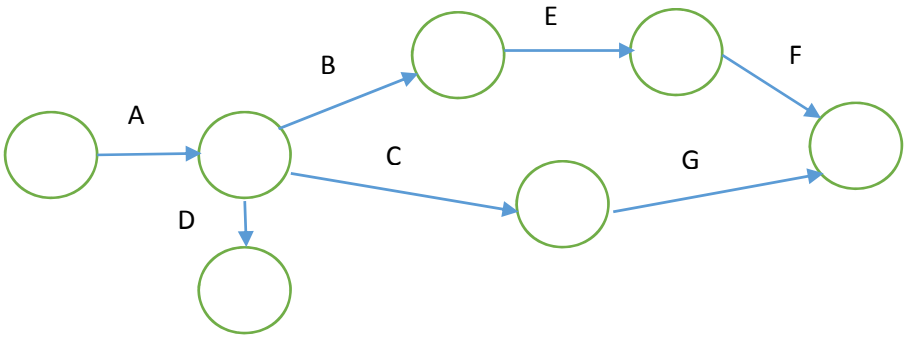
If some activities in a network form a loop (or cycle), then such error in network is called looping error as shown in the figure below:



In the above network B, C and D form a loop (cycle).Thus the network cannot proceed. Such situations can be avoided be checking the precedence relationship of the activities.

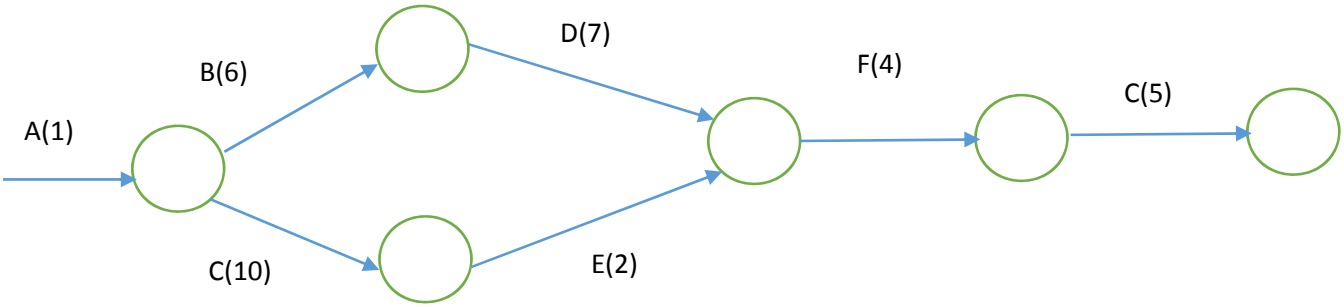
Dangling Error in Network:

If in a network some activity other than the final activity do not have successor activity then it is called a dangling error in a network. Such end events other than the end events of the project are called dangling events. Thus in a network all events except the first and last of the whole project must have at least one entering and one leaving activity.



In the network shown above the activity D leads to dangling .To avoid this dangling we introduce a dummy activity between the end event of this activity and the end event of the project.

Solution No 4:



Solution No 5:

Earliest Start Time(EST):

It is the earliest possible time by which an activity can start. It is calculated from the earliest start time of the tail event.

Latest Finish Time(LFT):

It is the latest possible time when an activity should end. It is calculated from the latest finish time of the head event .For its calculation we require the total project time.

Earliest Finish Time(EFT):

EFT=EST+ Duration of the activity.

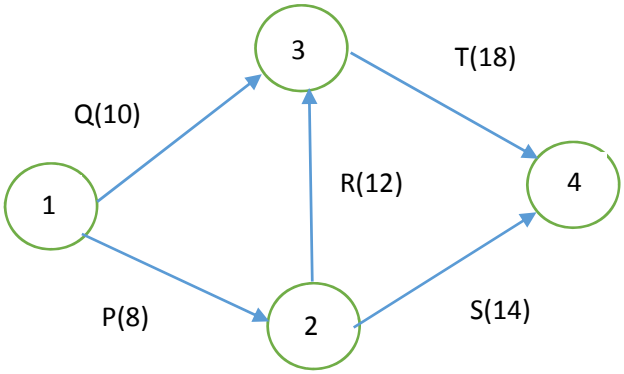
Latest Start Time(LST):

LST=LFT-Duration of activity.

Solution No 6:

Activity	Predecessor
A	-
B	A
C	A
D	A
E	C,D
F	D
G	E
H	G
I	F.H
J	B,I

Solution No 7:



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EST of event (1) =0

EST of event (2)=EST(1)+duration from 1 to 2=0+8=8

Event (3) can be approached from two ways either from event (1) or from event (2).

EST of event (3)=EST(1)+duration from 1 to 3=0+10=10

EST of event (3)=EST(2)+duration from 2 to 3=8+12=20

Maximum of these two will be the EST of event (3).Hence

EST of event (3)=20

Event (4) can be approached from two ways either from event (3) or from event (2).

EST of event (4)= EST(3)+duration from 3 to 4=20+18=38

EST of event (4)=EST(2)+duration from 2 to 4=8+14=22

Maximum of these two will be the EST of event (4).Hence

EST of event (4)=38

Event	EST
1	0
2	8
3	20
4	38

EST of any activity will be the EST of its tail event

EFT=EST+ Duration

Activity	Duration	EST	EFT
1-2	8	0	8
1-3	10	0	10
2-3	12	8	20
2-4	14	8	22
3-4	18	20	38

Solution No 8:

Try to solve it by yourself. If you find any difficulty in solution feel free to contact me.