10/1/12

Critical Path Analysis

Using a network model to control progress of a project

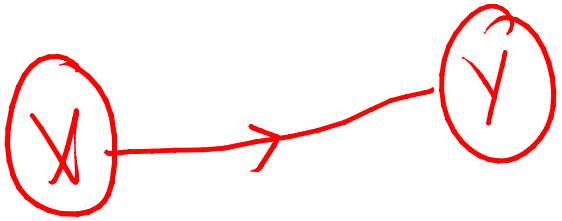
Project = {activities}

vertices

Relationships between activies:

Must complete X before starting Y

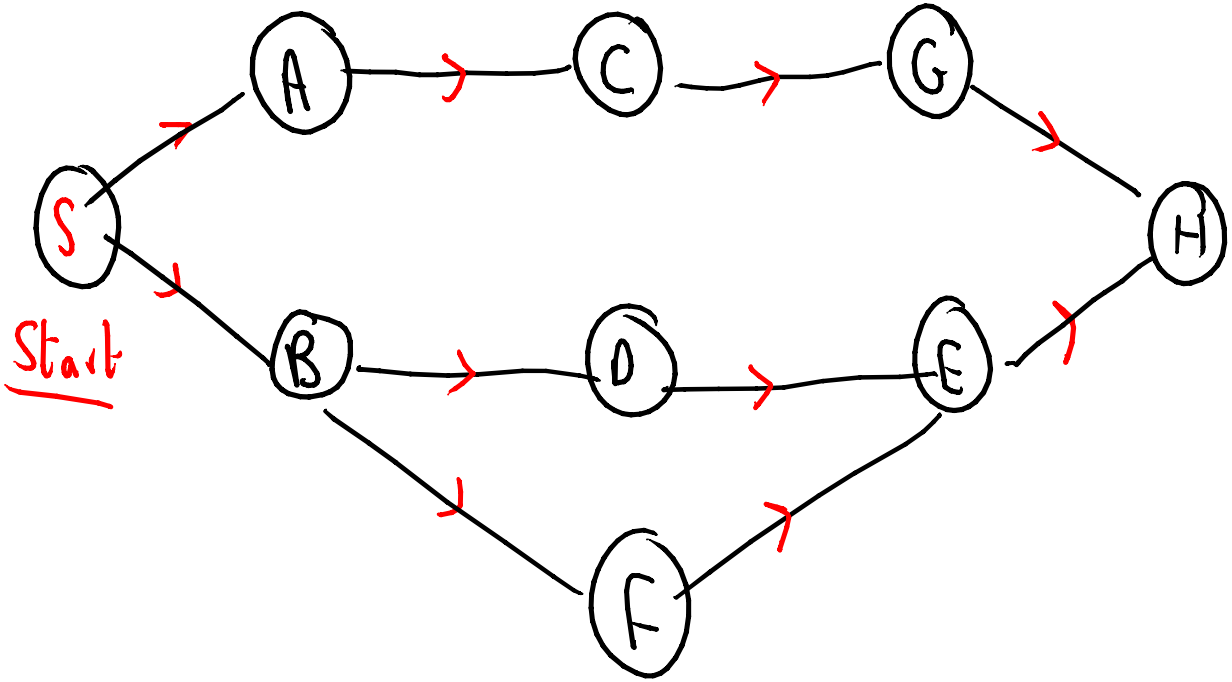
Digraph:



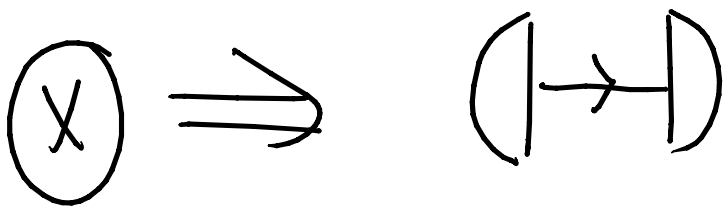
Each activity has a duration.

Question: what is minimum time needed to complete project

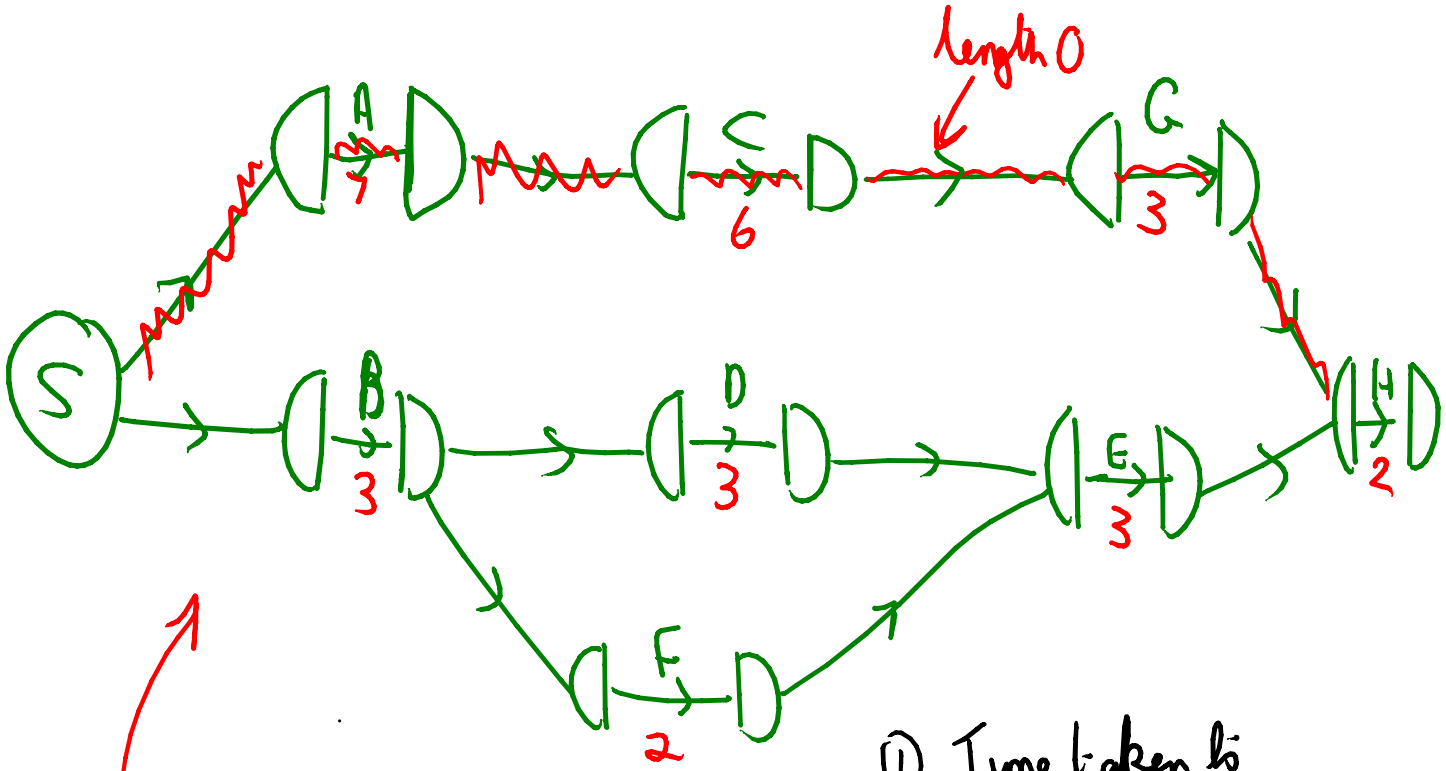
Example 8 activities



Activity	A	B	C	D	E	F	G	H
Duration	7	3	6	3	3	2	3	2

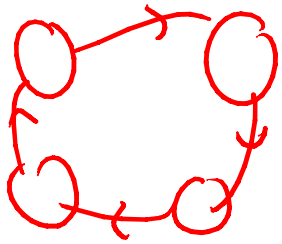


Longest path = critical path



length 0

DAC



① Time taken to complete project = maximum length of a path from (S) .... (H)

Float = Latest start time −

of an activity

Earliest start time

(assuming we finish a.s.a.p.)

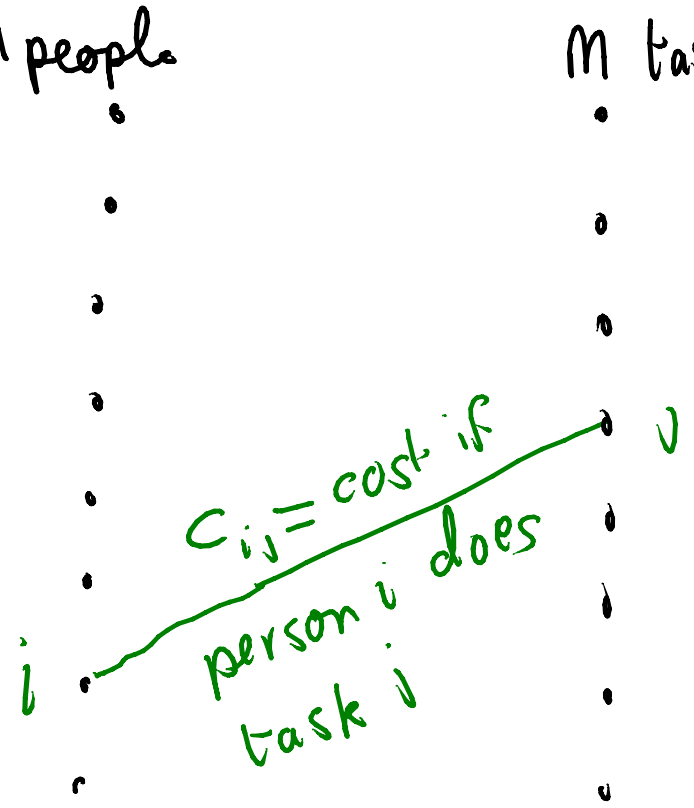
= 0 for critical activities

Suppose T. = finish time.

= T − (max. distance to Finish from ◻)

max. distance from start to ◻

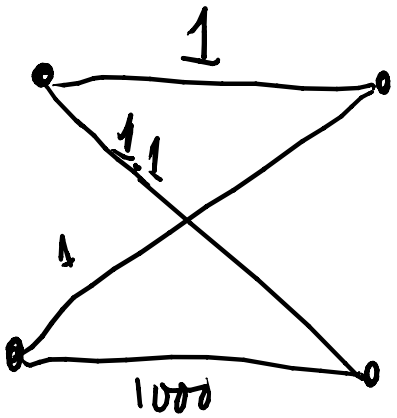
Assignment Problem



Each person is assigned a different task

solutions = $n!$

Problem: assign tasks to minimise total cost



Being "myopic" is not always a good idea.

Idea

For $k = 1$ to m do

{
given min. cost assignment of $[k] \longrightarrow [k]$,

find min. cost assignment of $[k+1] \longrightarrow [k+1]$
}

SHORTEST PATH PROBLEM