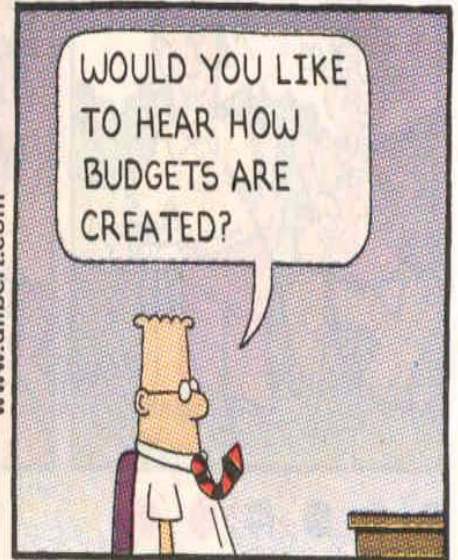
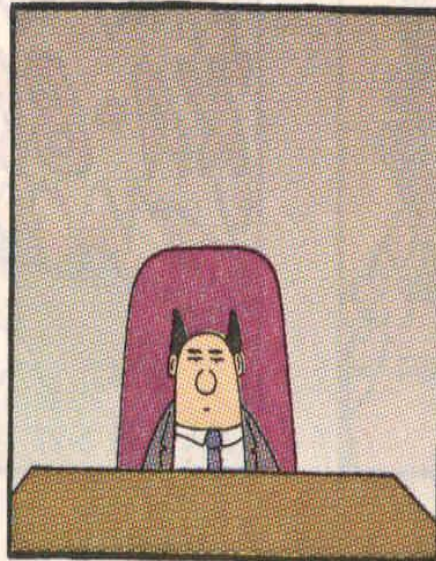
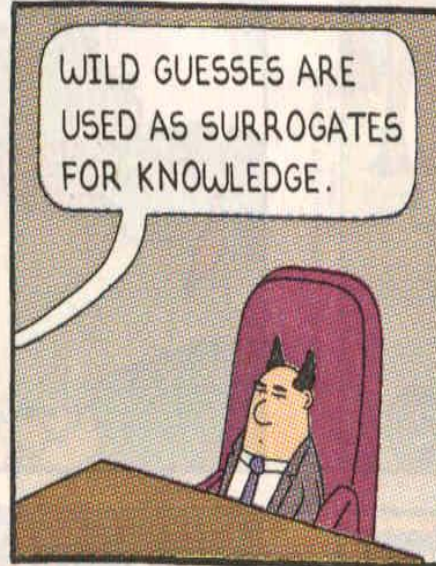
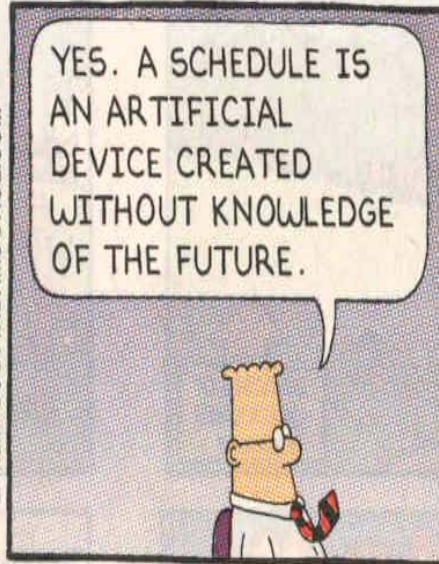
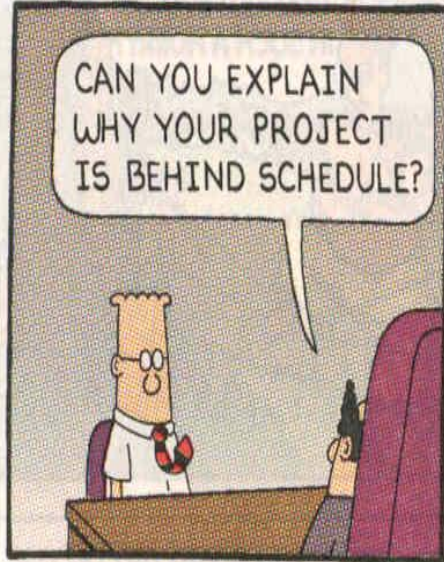


The World of Project Management

Module 13
July 24, 2014





E-mail: SCOTTADAMS@AOL.COM


© 2000 United Feature Syndicate, Inc.

www.dilbert.com

WHAT IS A PROJECT?



Examples of Projects

- ❑ Wedding/divorce
 - ❑ Organize a golf tournament
 - ❑ Building construction
 - ❑ Bridge construction
 - ❑ Build aircraft carrier
 - ❑ R&D project
 - ❑ Audit
 - ❑ New product introduction
 - ❑ Open or close a facility
 - ❑ Redo warehouse layout
 - ❑ Make a movie
 - ❑ Fund raising campaign
 - ❑ Ad campaign
 - ❑ Software installation
- 

Why the emphasis on project management?

- Many tasks do not fit neatly into business-as-usual.
- Need to assign responsibility and authority for achievement of organizational goals.



Characteristics of Projects

- Unique
- Specific Deliverable
- Specific Due Date



Other Common Characteristics of Projects

- Multidisciplinary
- Conflict
- Complex
- Part of Programs



PMI Definition

“A temporary endeavor undertaken to create a unique product or service”

Project Management Institute, 2000



Definition

- a series of jobs usually directed toward some major output and requiring a significant period of time to perform



PROJECT MANAGEMENT VS. GENERAL MANAGEMENT



Skill Requirements for Effective Project Management

- Conflict Resolution
- Creativity and Flexibility
- Ability to Adjust to Change
- Good Planning
- Negotiation
 - win-win versus win-lose



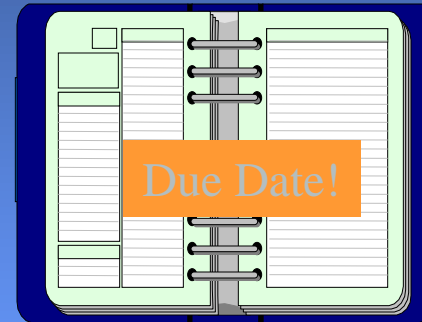
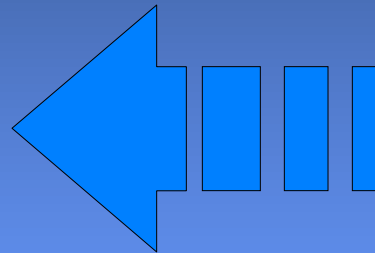
WHAT IS MANAGED? THE THREE GOALS OF A PROJECT



Objectives and Tradeoffs



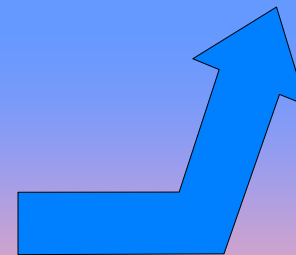
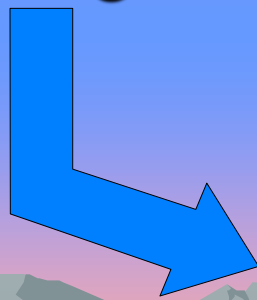
Stay within
the budget



Meet the
Deadline--schedule

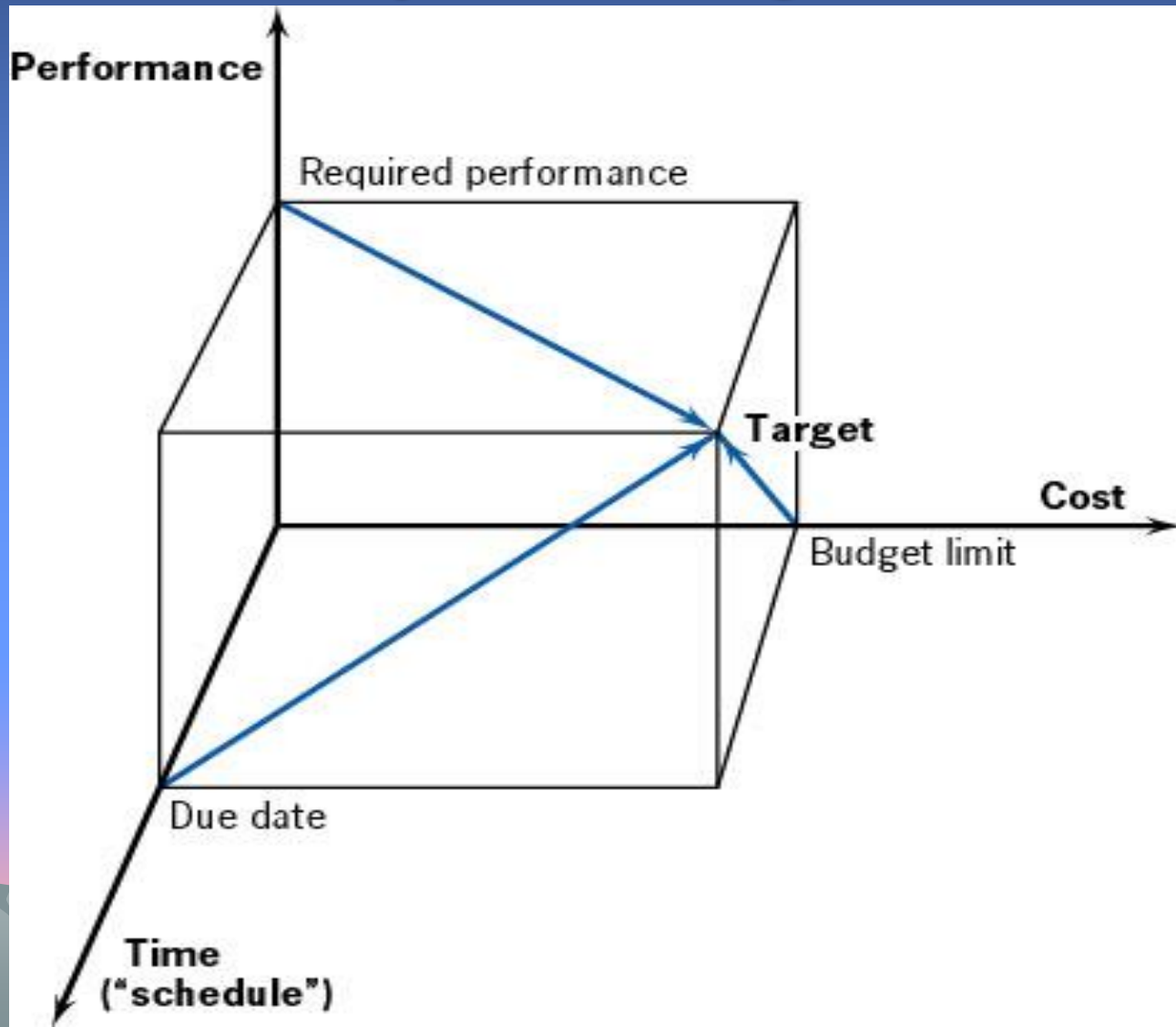


Meet the
specifications



Performance, Cost, and Time

Project Targets



To Put A Man On The Moon

- The year 1962
- “We commit this nation to put a man on the moon and return him safely to this earth by the end of this decade, and to do the other things, not because they are easy but because they are hard.”
- The triple constraint project has begun.

The Three Constraints Are

- **Time constraint:** How long do you have?
- **Budget constraint:** How much can you spend?
- **Performance criteria:** What results must your project achieve to meet its purpose?
- Project: Put a man on the moon
- Time: constraint: By the end of the decade.
- Performance: Safe return to Earth
- Budget: Unknown

Old Joke

- You can have it fast.
- You can have it cheap.
- You can have it good.
- Pick any two!



Key Segments of Project Management

Planning

- Objectives
- Set Goals
- Organization

Scheduling

- Tying Resources to Activities
- Scheduling Activities

Controlling

- Monitoring
- Revising and Changing
- Modifying Resources to Meet Project Constraint

Project Initiation

- A. Business Problem or Opportunity Identified, Solution is Identified and Project Team Established
- B. Project Manager Ultimately Responsible for Successful Execution of Project.



Project Planning

- A. Creation of a Number of Planning Documents:
 - Project Plan
 - Activities, Interdependencies, Time Estimates
 - Resource Plan
 - What Resources Are Required
 - Financial Plan
 - Estimated Costs
 - Quality Plans
 - Quality Targets, Control and Improvement Techniques
 - Communications Plan
 - Updates to Stakeholders
 - Risk Plan
 - Assessment of Risks and Uncertainties



Organizational Considerations in Project Management

- High-Performance Project Teams
 - Creating a successful team requires consideration of:
 - Task-related variables
 - People-related variables
 - Leadership variables
 - Organization variables



Organizational Considerations in Project Management (cont'd)

- Barriers to High Team Performance:
 - Different points of view
 - Role conflicts
 - Power struggles



Activity Lists

- Breakdown of all activities/tasks in a project
 - Precedence constraints
 - One task can't be started until another is finished
 - Duration of activities



Activity List for Example Problem

Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8
F	Select personnel to move	C	2
G	Hire new employees	F	4
H	Move records, key personnel, etc.	F	2
I	Make financial arrangements	B	5
J	Train new personnel	H,E,G	3

Network Diagrams

- Show the sequence of activities in a project
- Consists of *nodes* and *arrows*
 - Nodes show activities (AON: activity on node)
 - Arrows show precedence



Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3

A

B

Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5

A

B

C

Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3



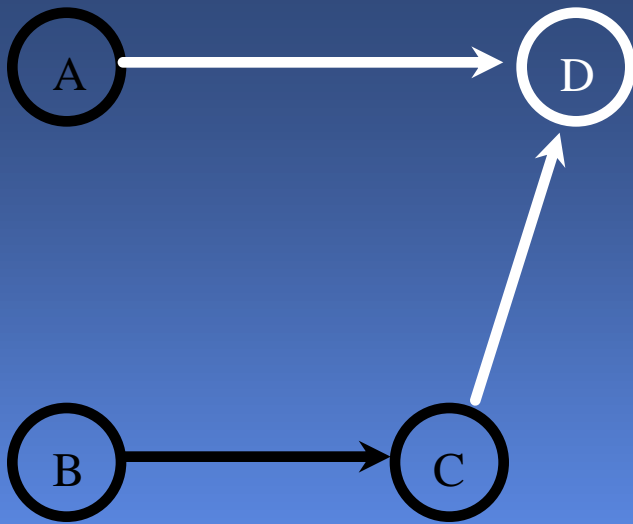
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3



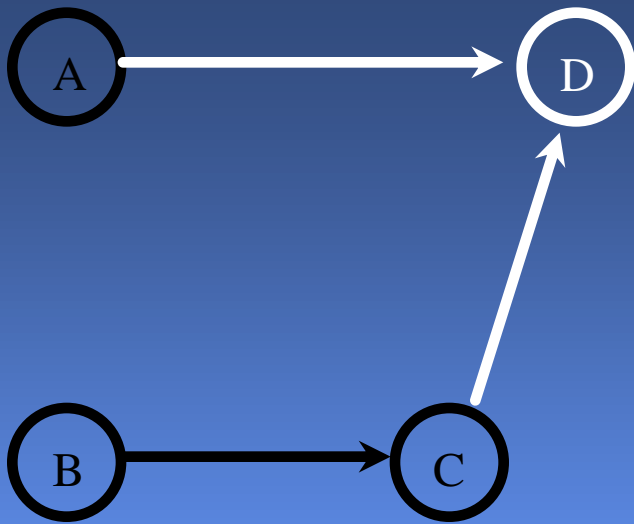
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4



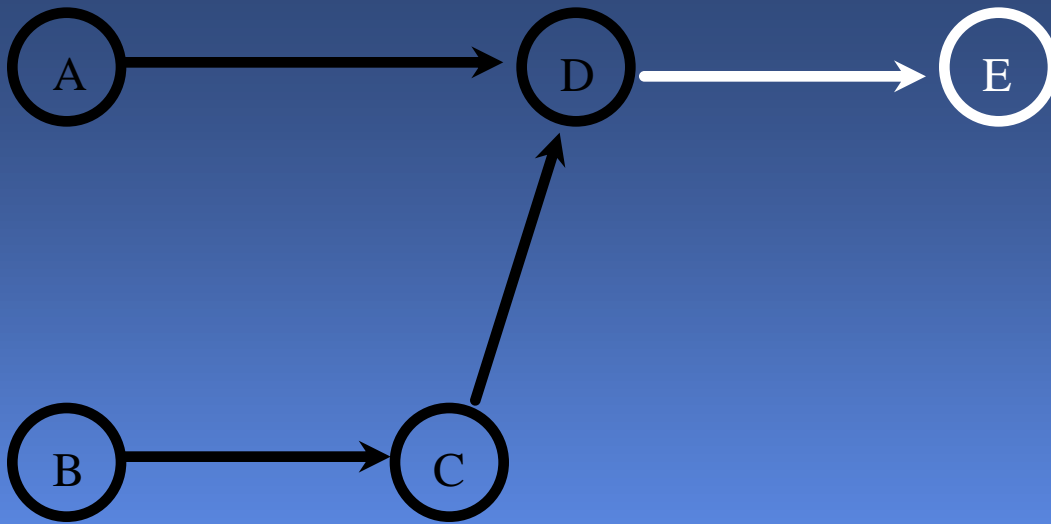
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4



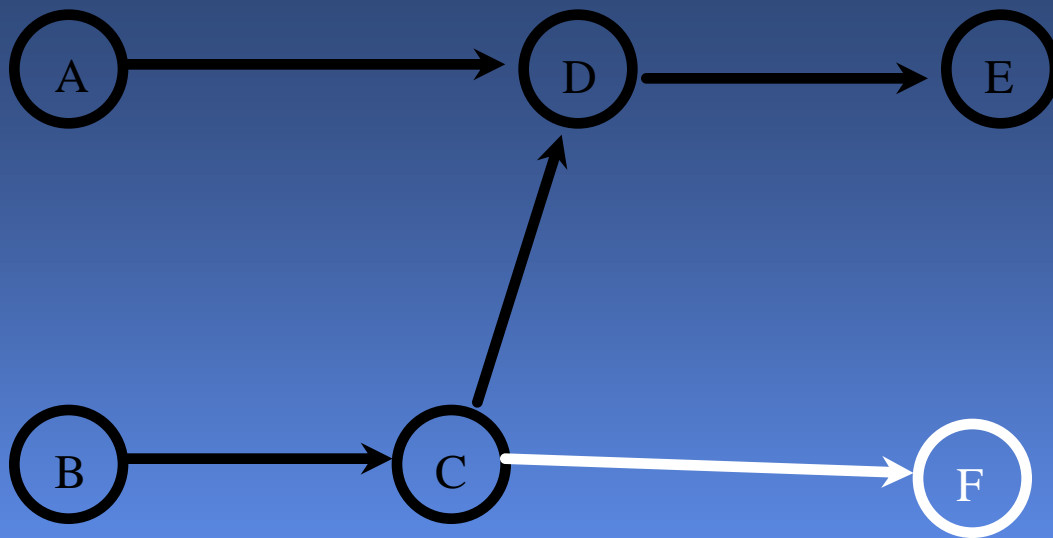
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4



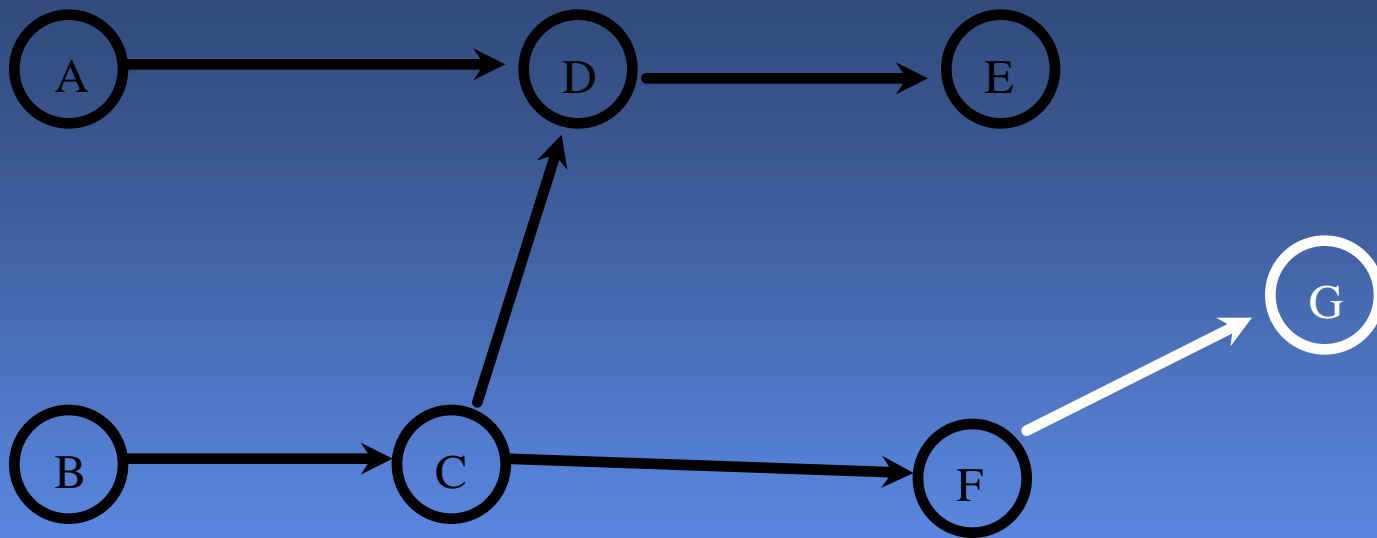
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8



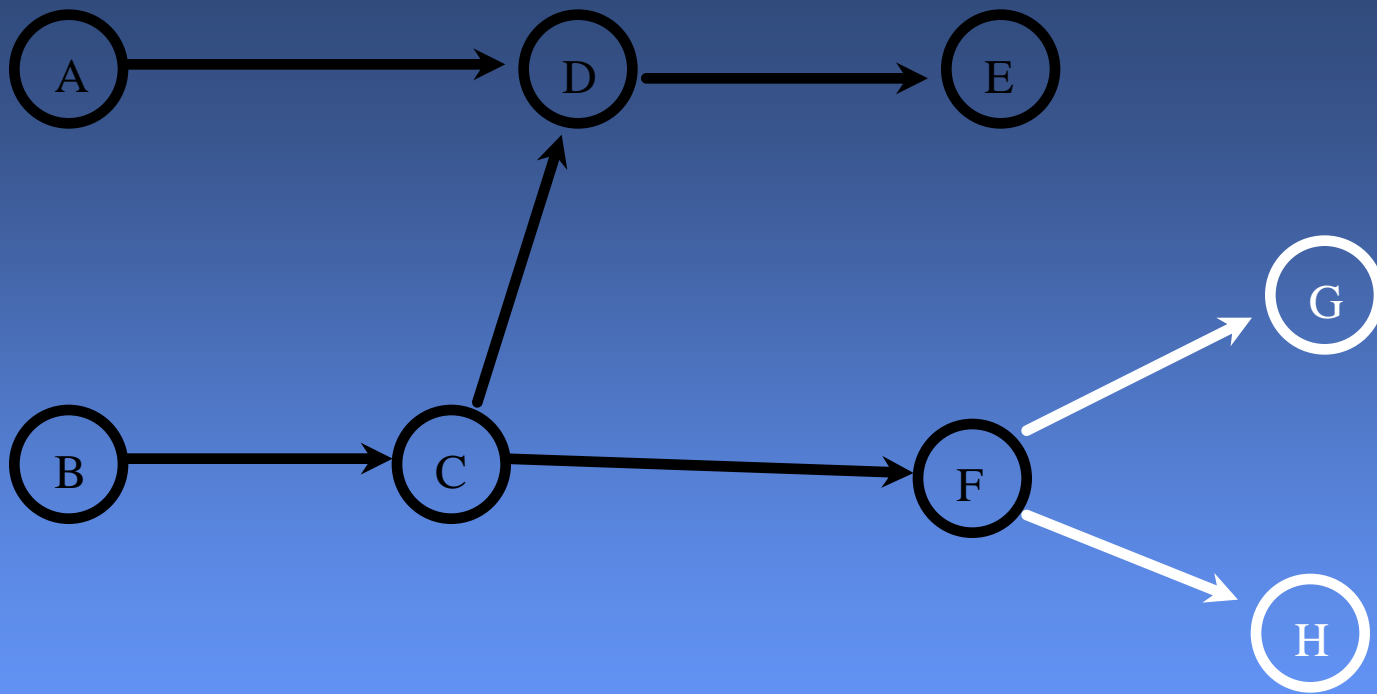
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8



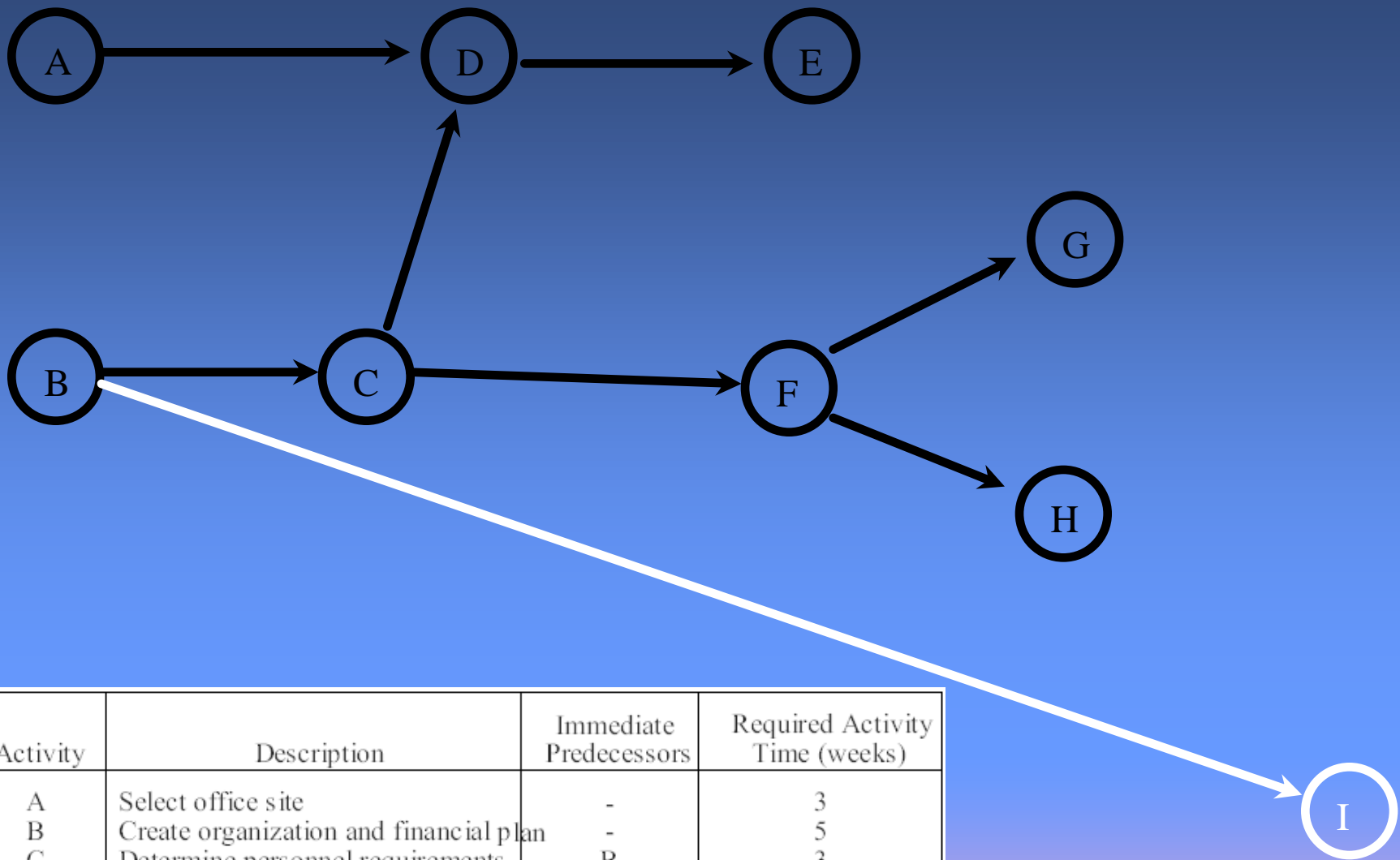
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8
F	Select personnel to move	C	2



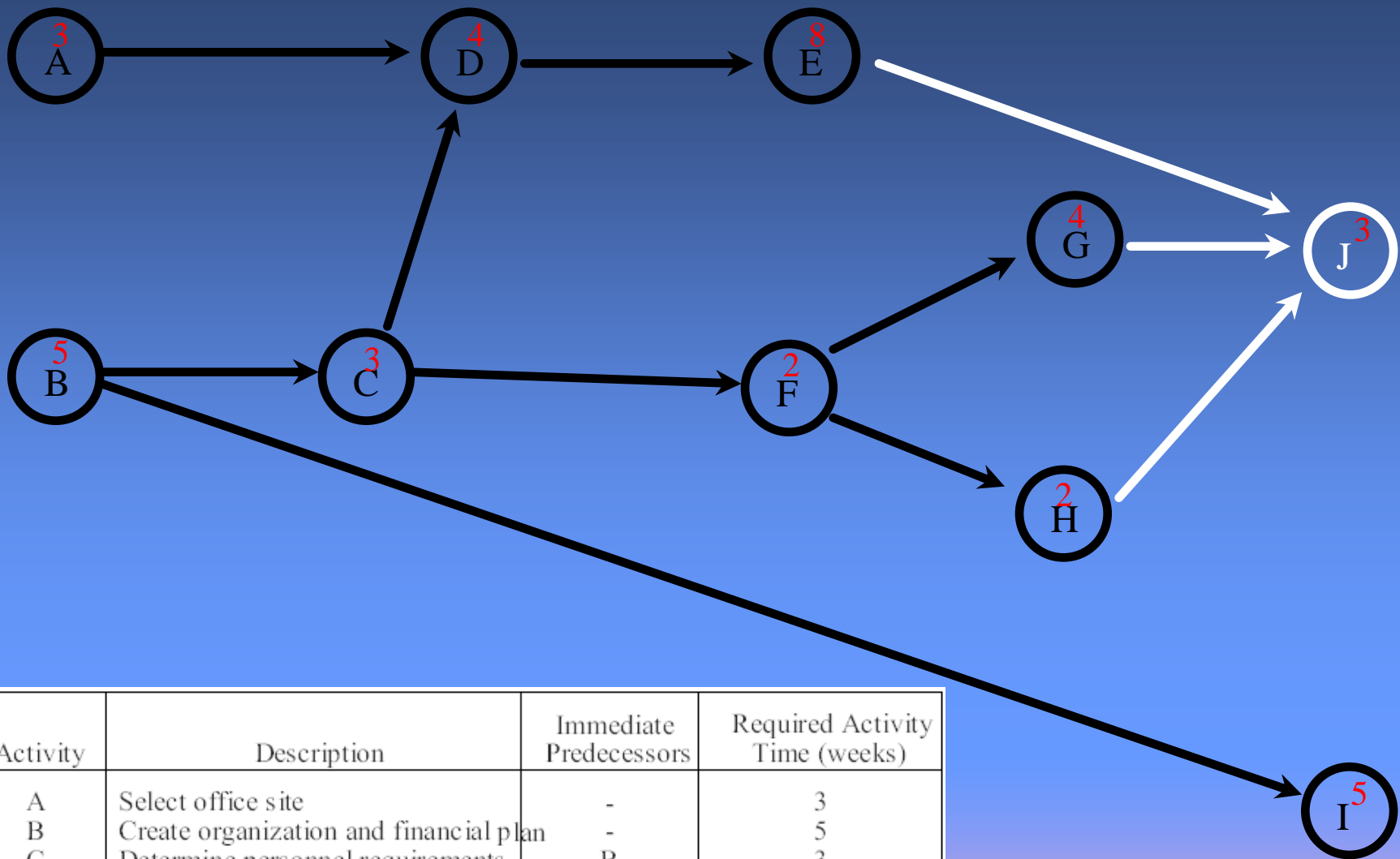
Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8
F	Select personnel to move	C	2
G	Hire new employees	F	4



Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8
F	Select personnel to move	C	2
G	Hire new employees	F	4
H	Move records, key personnel, etc.	F	2



Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8
F	Select personnel to move	C	2
G	Hire new employees	F	4
H	Move records, key personnel, etc.	F	2
I	Make financial arrangements	B	5



Activity	Description	Immediate Predecessors	Required Activity Time (weeks)
A	Select office site	-	3
B	Create organization and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct the interior	D	8
F	Select personnel to move	C	2
G	Hire new employees	F	4
H	Move records, key personnel, etc.	F	2
I	Make financial arrangements	B	5
J	Train new personnel	H,E,G	3

CPM

- **C**ritical **P**ath **M**ethod
- Used under conditions of certainty in activity times
- Requires one time estimate for each activity
- Looks at time/cost trade-offs
 - Normal activity time
 - Normal cost
 - Crash time
 - Crash cost

Critical Path Scheduling

- **PERT (Program Evaluation and Review Technique)**
 - The technique developed by the U.S. Navy for planning the Polaris missile project.



PERT

- **A. Program Evaluation and Review Technique:**
Addresses the Impact of Uncertainties in Activity Time Estimates on the Duration of the Entire Project
- **B. Different Estimates for Activity Times are Developed:**
 - Optimistic time (t_o): minimum possible time required to complete an activity, assuming that everything proceeds better than is normally expected
 - Pessimistic time (t_p): maximum possible time required to complete an activity, assuming that everything proceeds at the slowest possible pace
 - Most likely time (t_m): best estimate of the time required to accomplish a task assuming that everything proceeds normally
 - Expected time (t_e): best estimate of the time required to accomplish an activity considering the potential impact of t_o , t_m , and t_p

Critical Path Scheduling

- Project Characteristics
 - Well-defined jobs or tasks indicating completion of the project.
 - Tasks must be independent of each other.
 - Job or tasks are ordered such that each must follow a particular or given sequence.



Critical Path Analysis

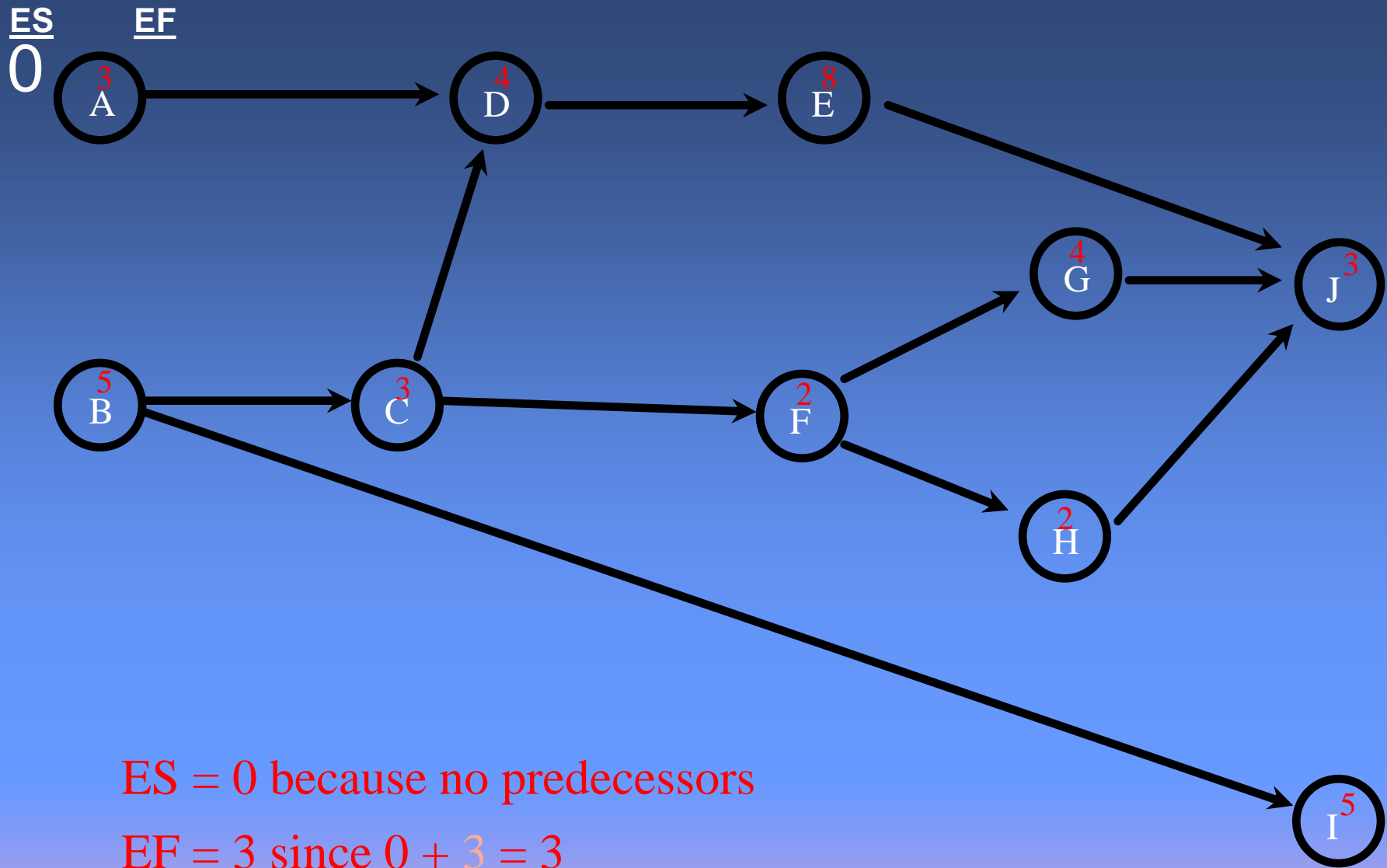
- Find all paths and compute expected length
 - ADEJ = 18
 - BCDEJ = 23 ← **Critical Path**
 - BCFGJ = 17
 - BCFHJ = 15
 - BI = 10
- Longest time pathway is duration of the project
- Delays in activities on the critical path will delay the project
- The critical path activities will have the least slack

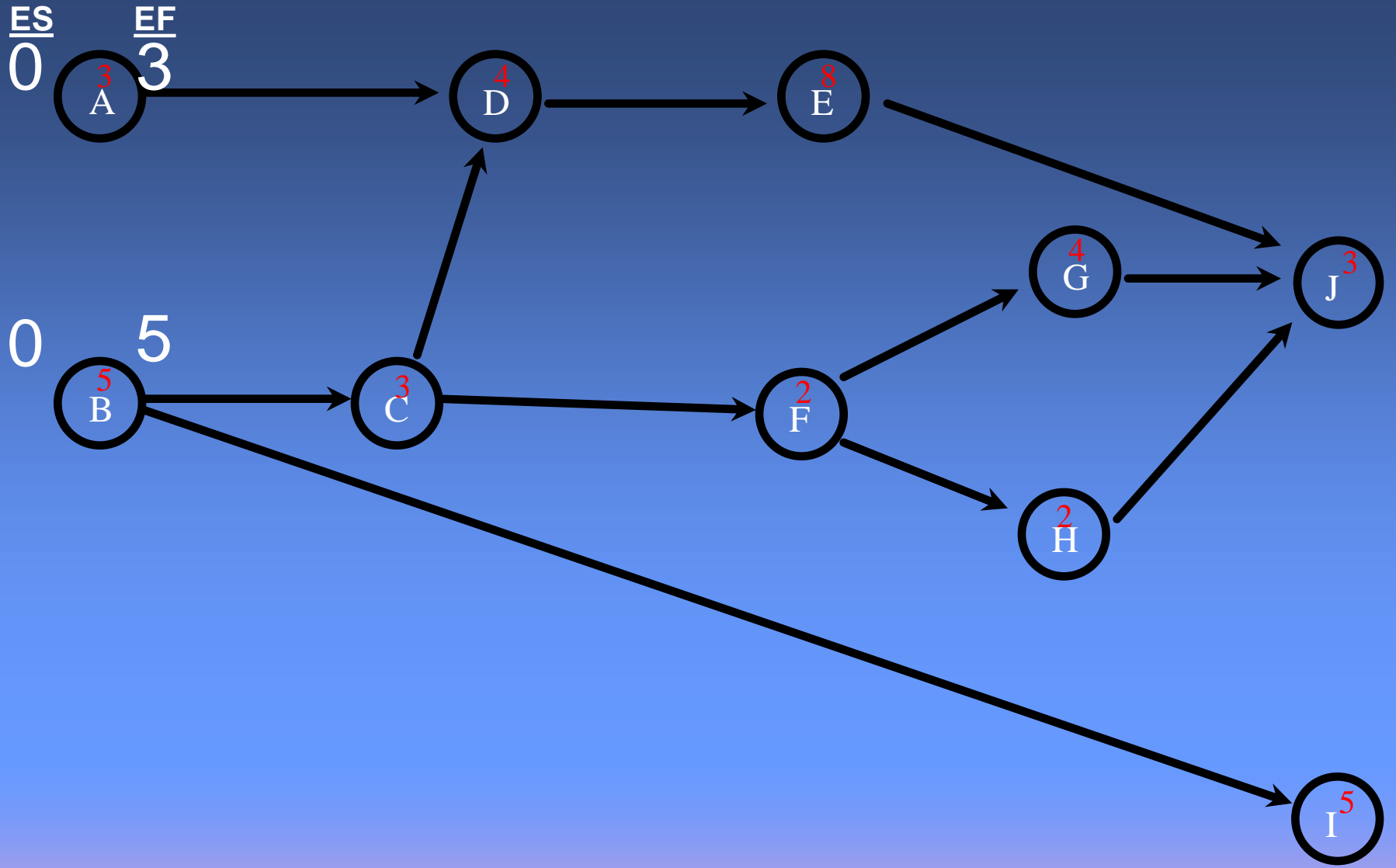


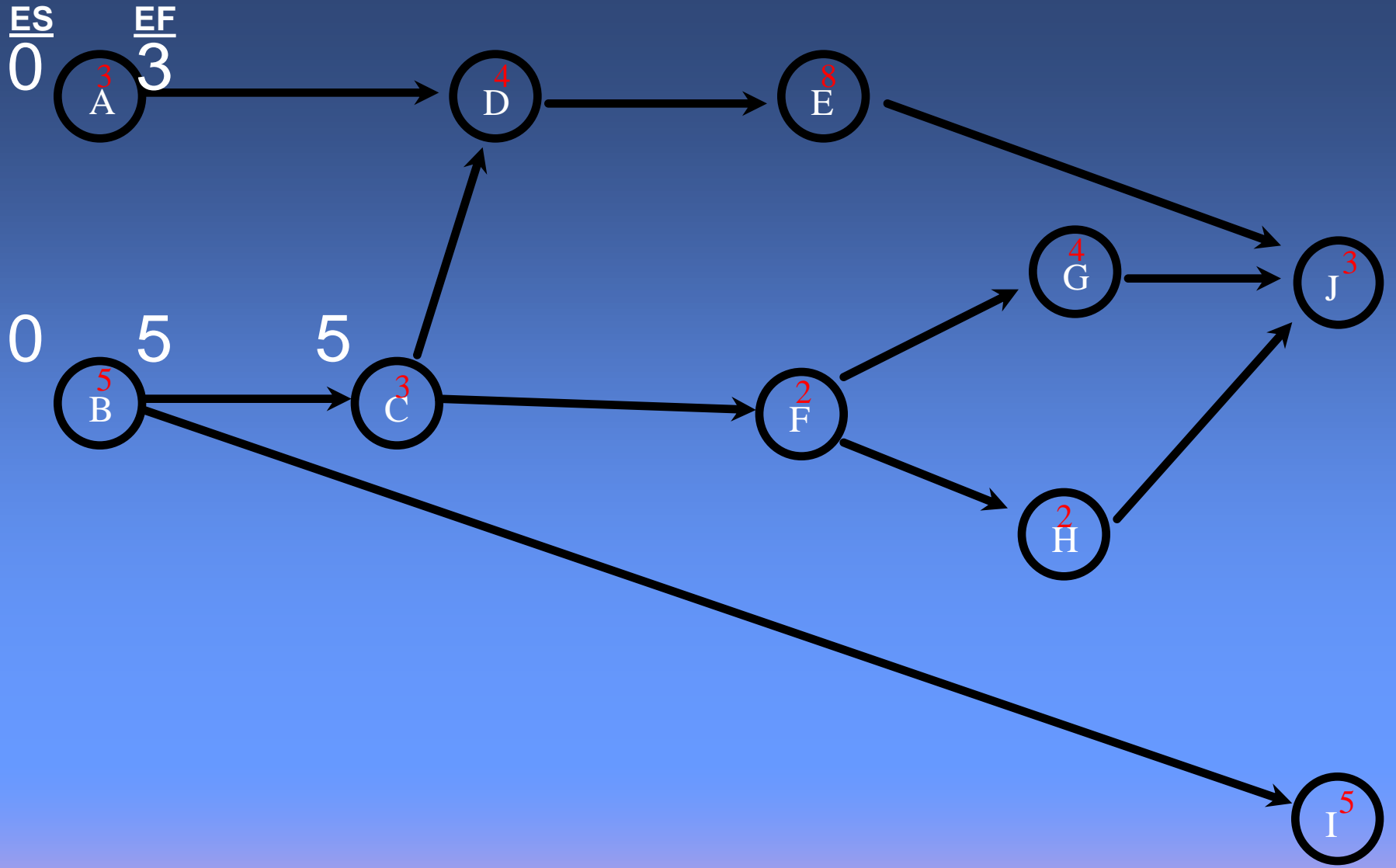
Early Start/Early Finish (ES/EF)

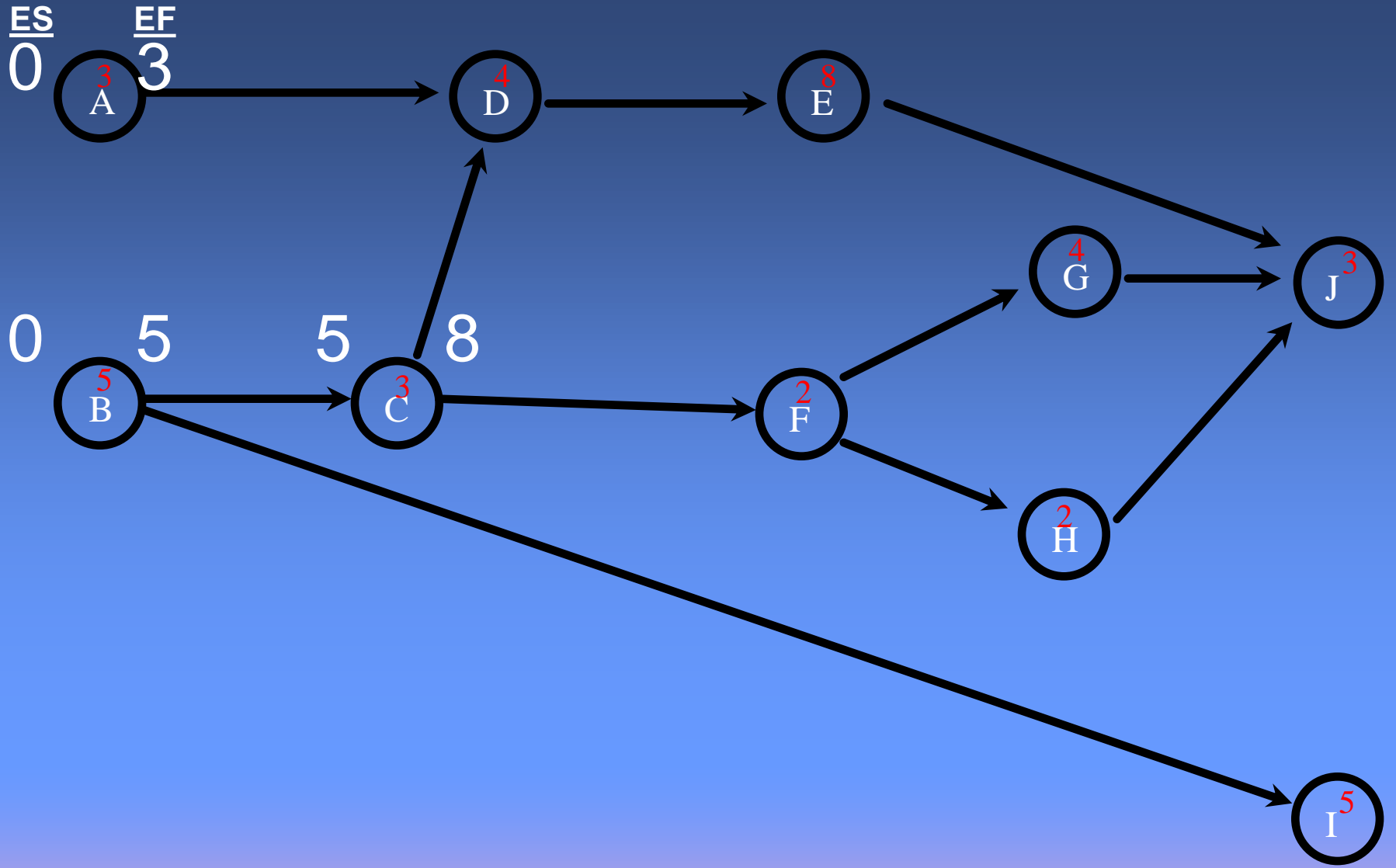
- The earliest an activity can be started and finished (without delaying the project).
- $ES = 0$ if no predecessors
- $ES = \text{maximum EF of the predecessors}$
- $EF = ES + \text{activity duration}$

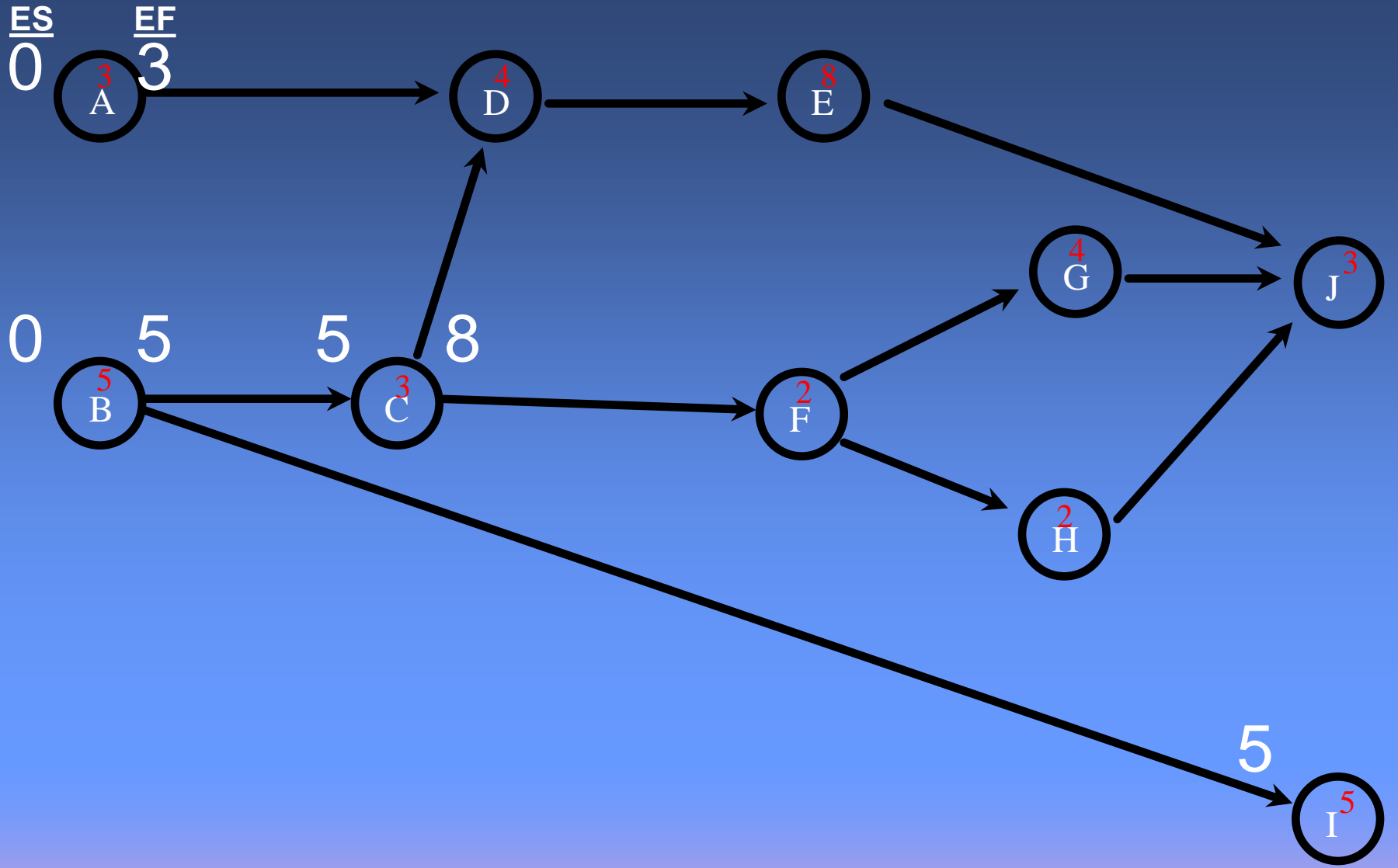
**Work forward
through time**

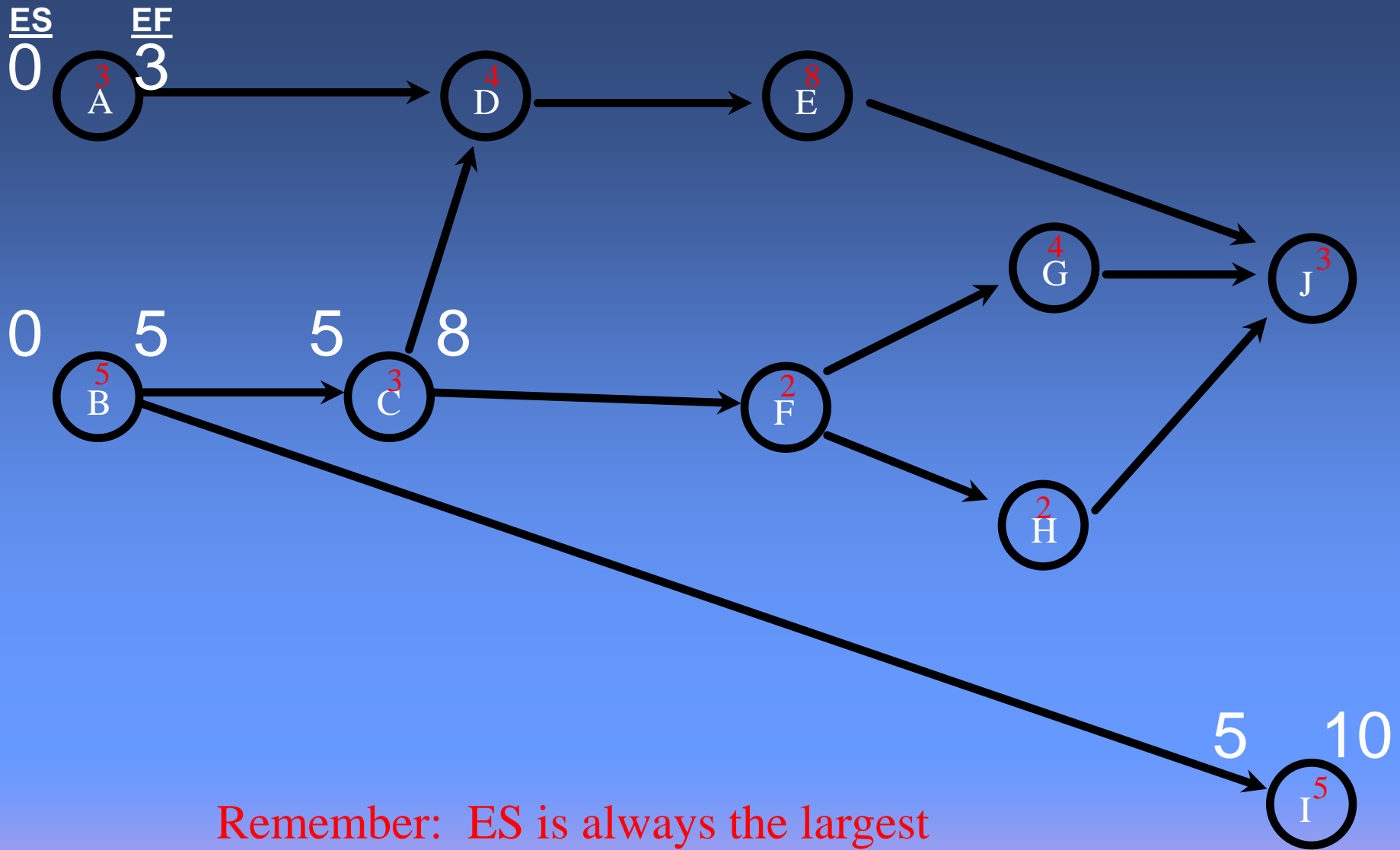




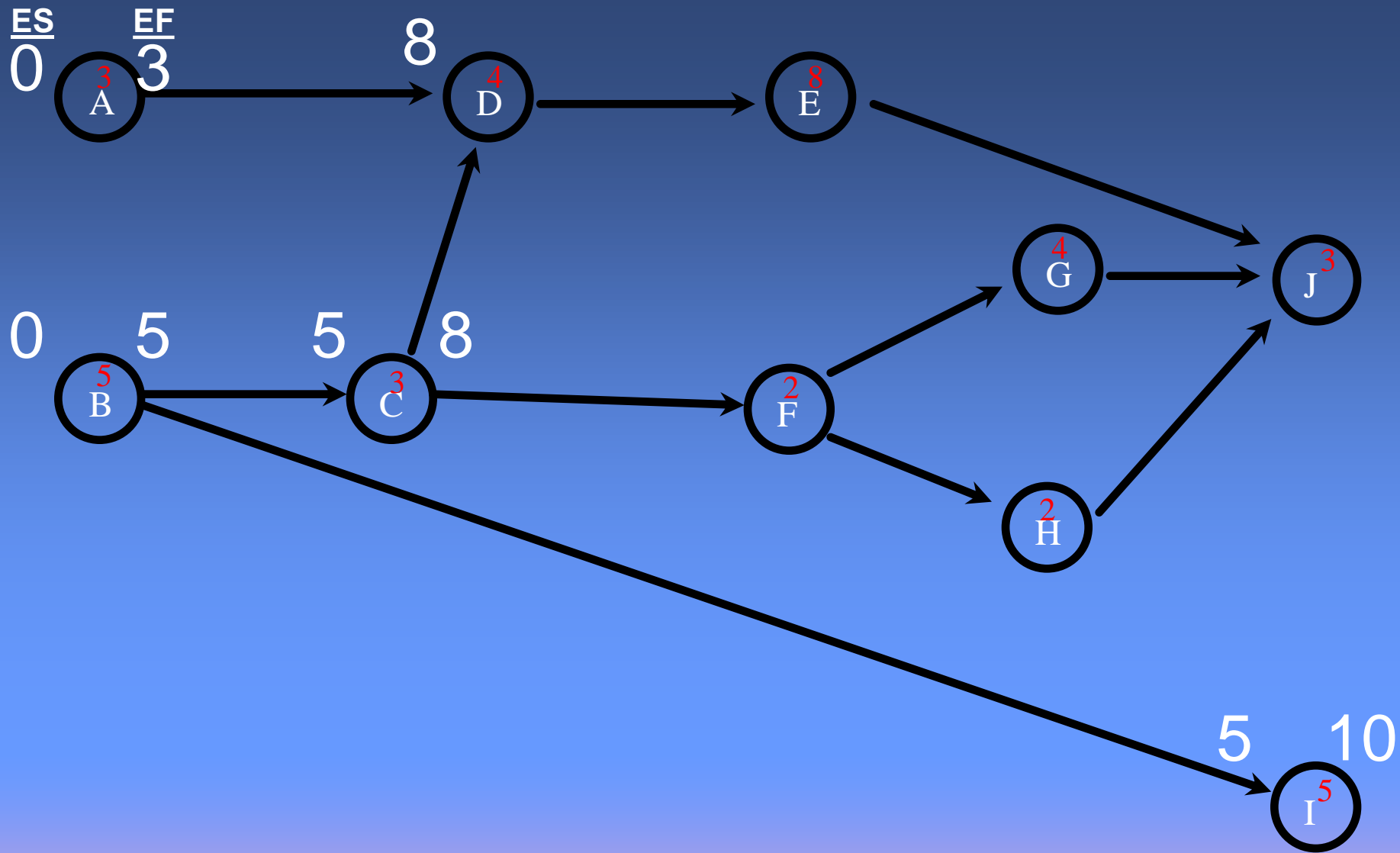


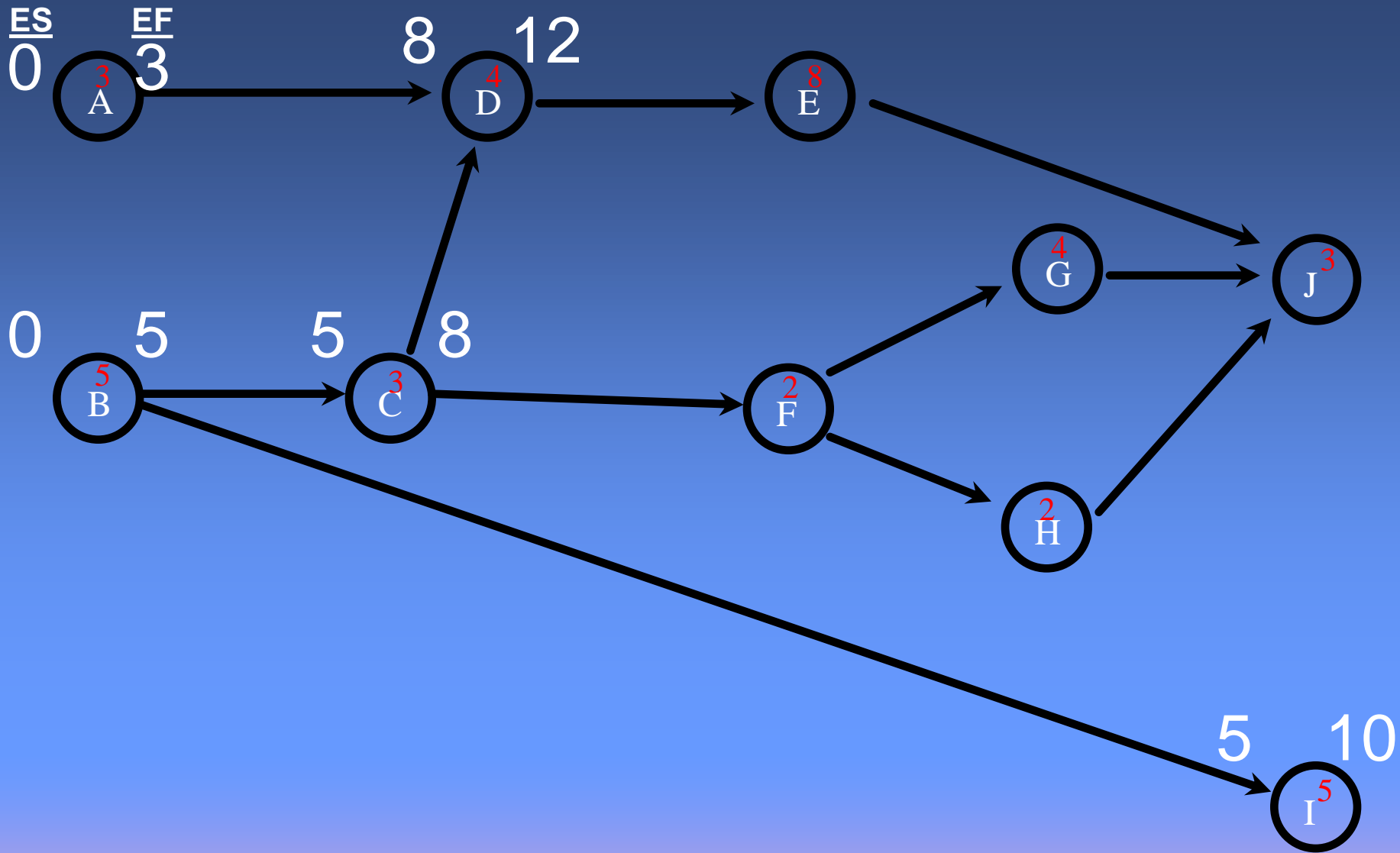


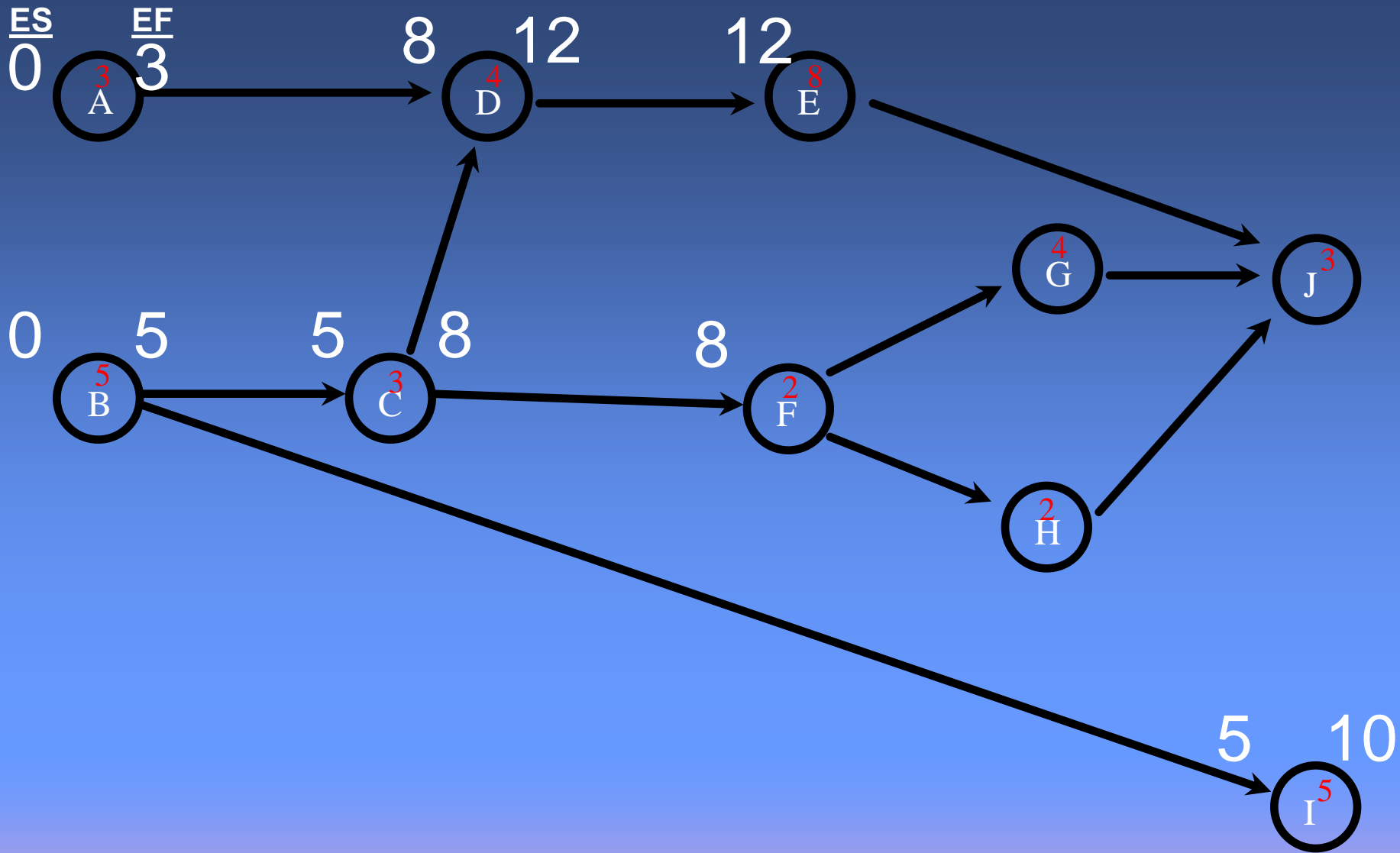


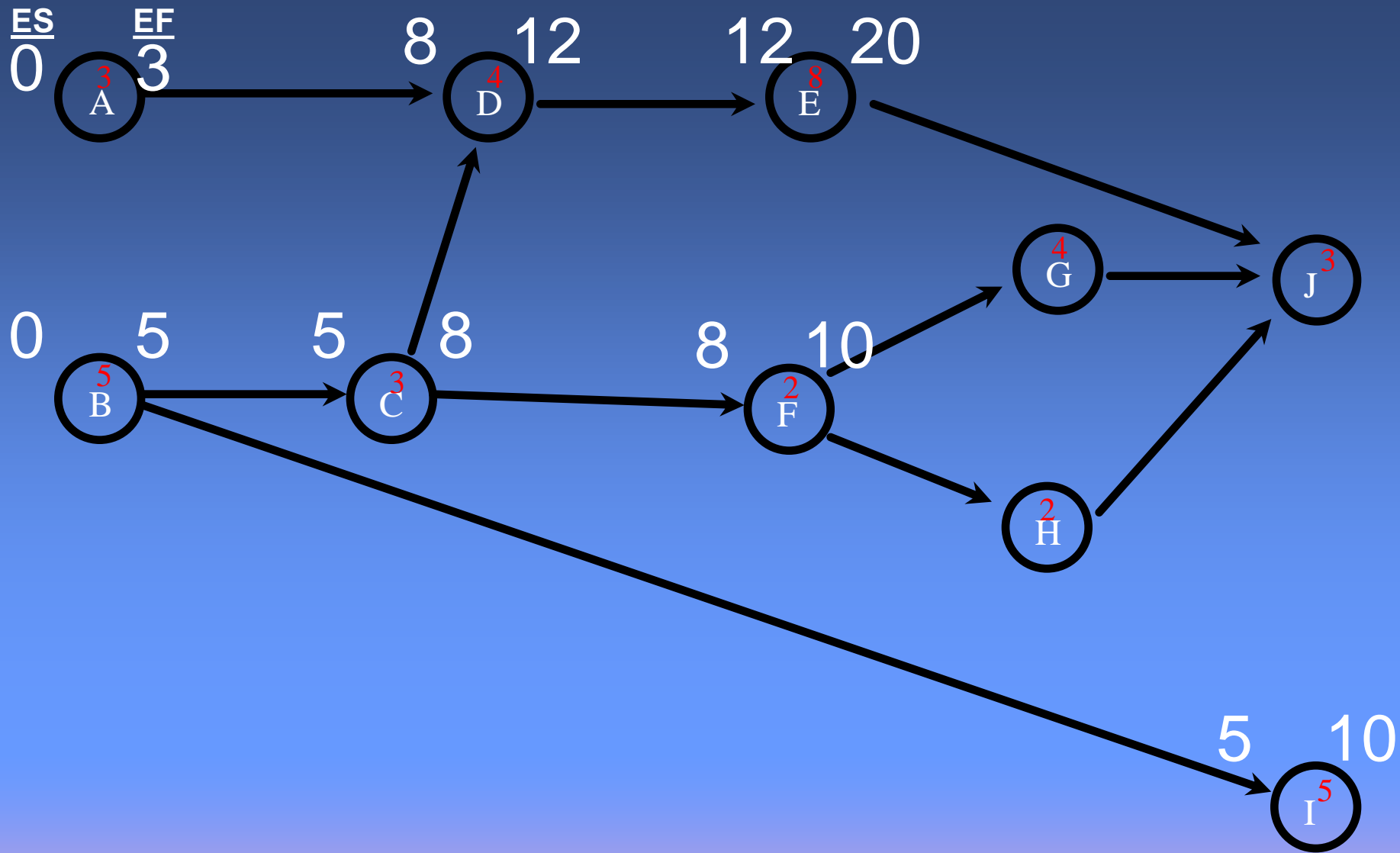


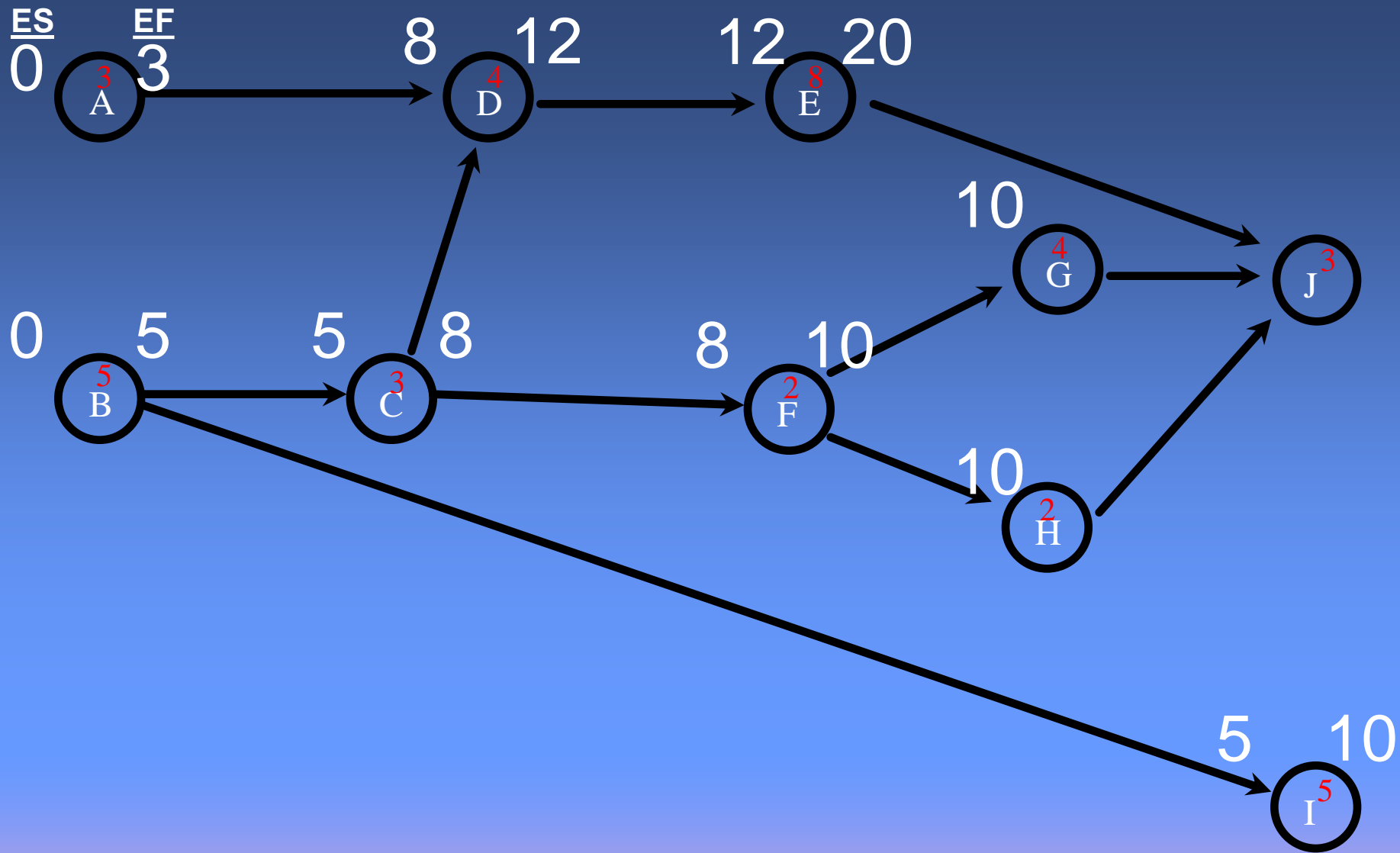
Remember: ES is always the largest of the predecessors' Early Finishes

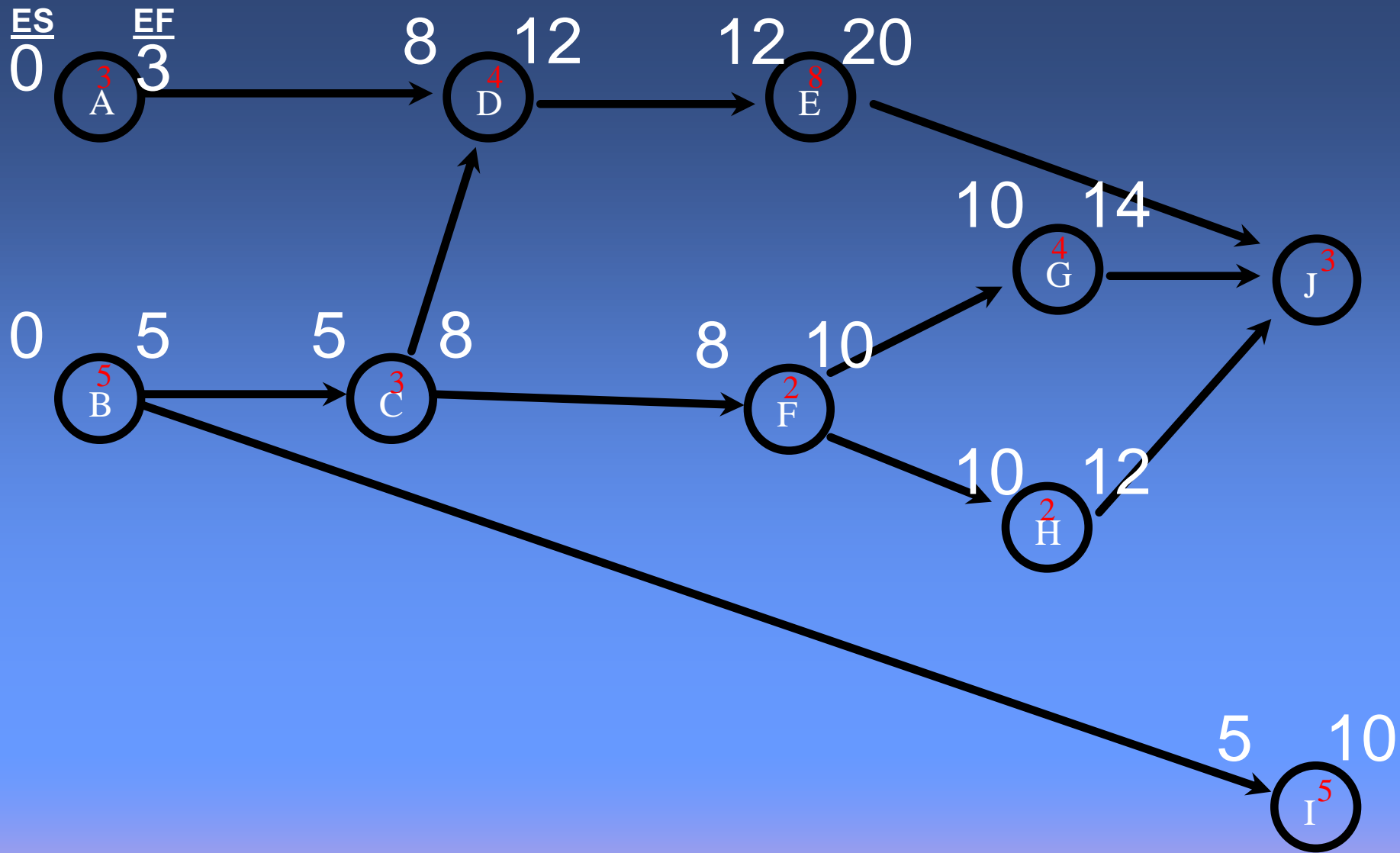


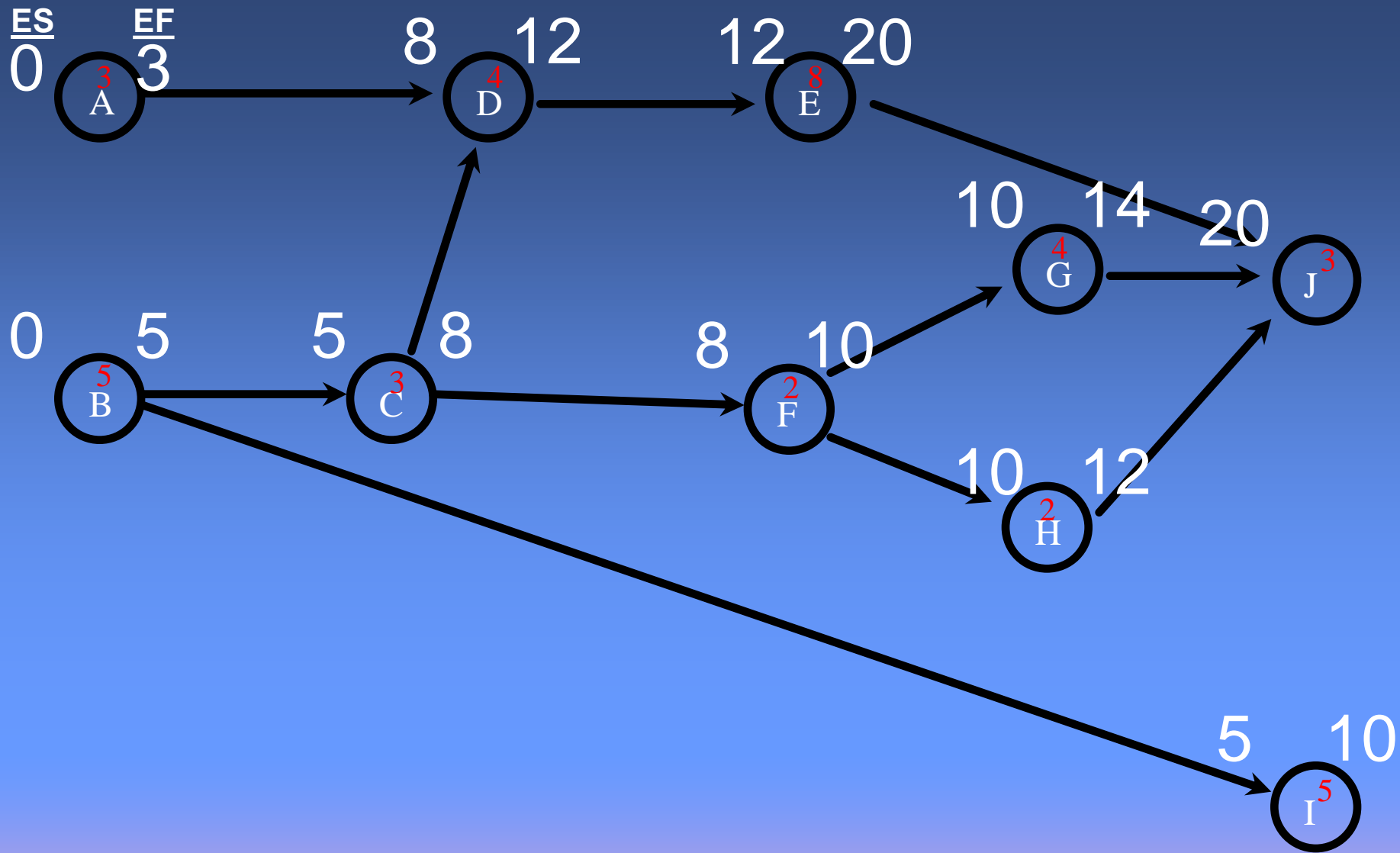


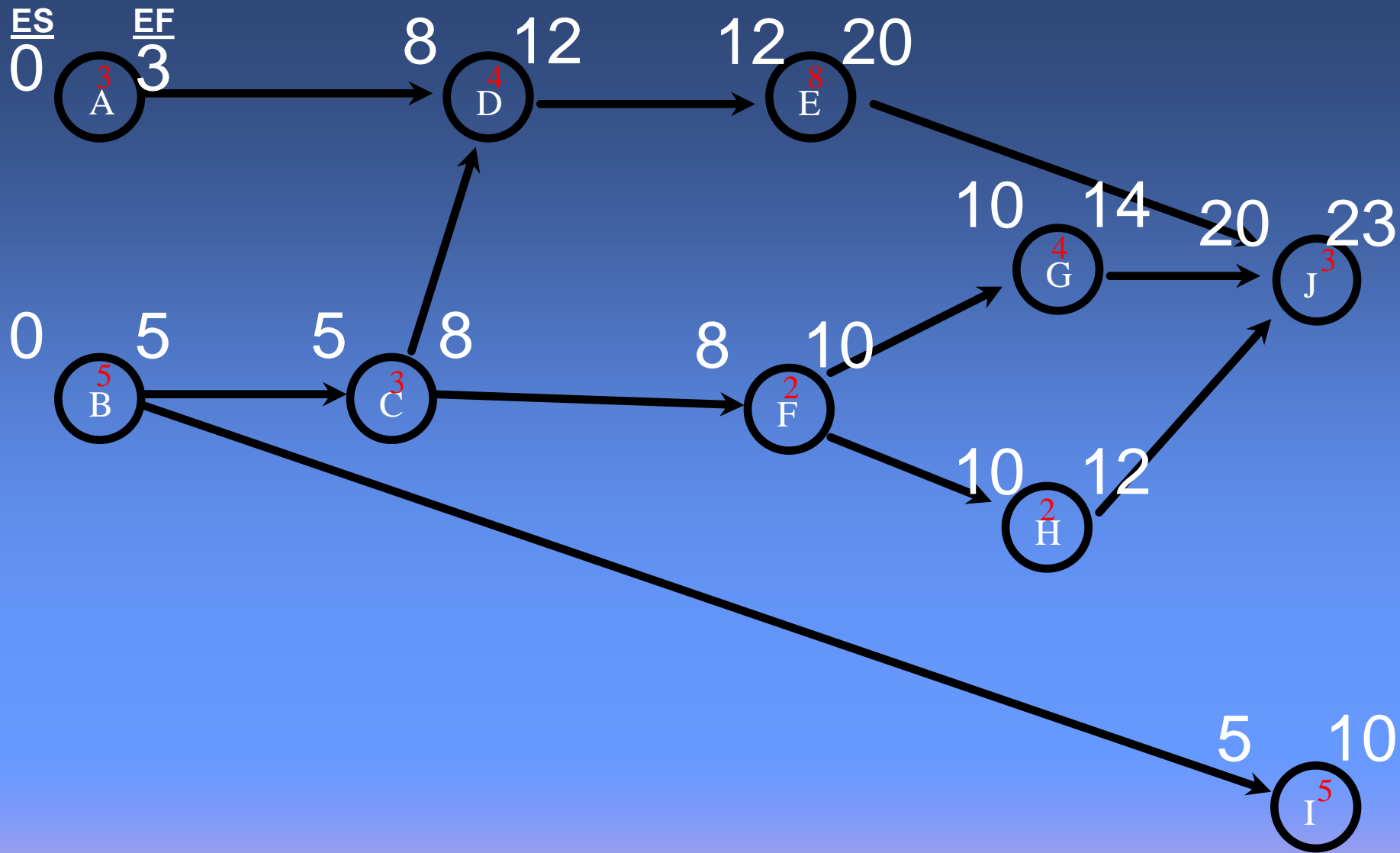








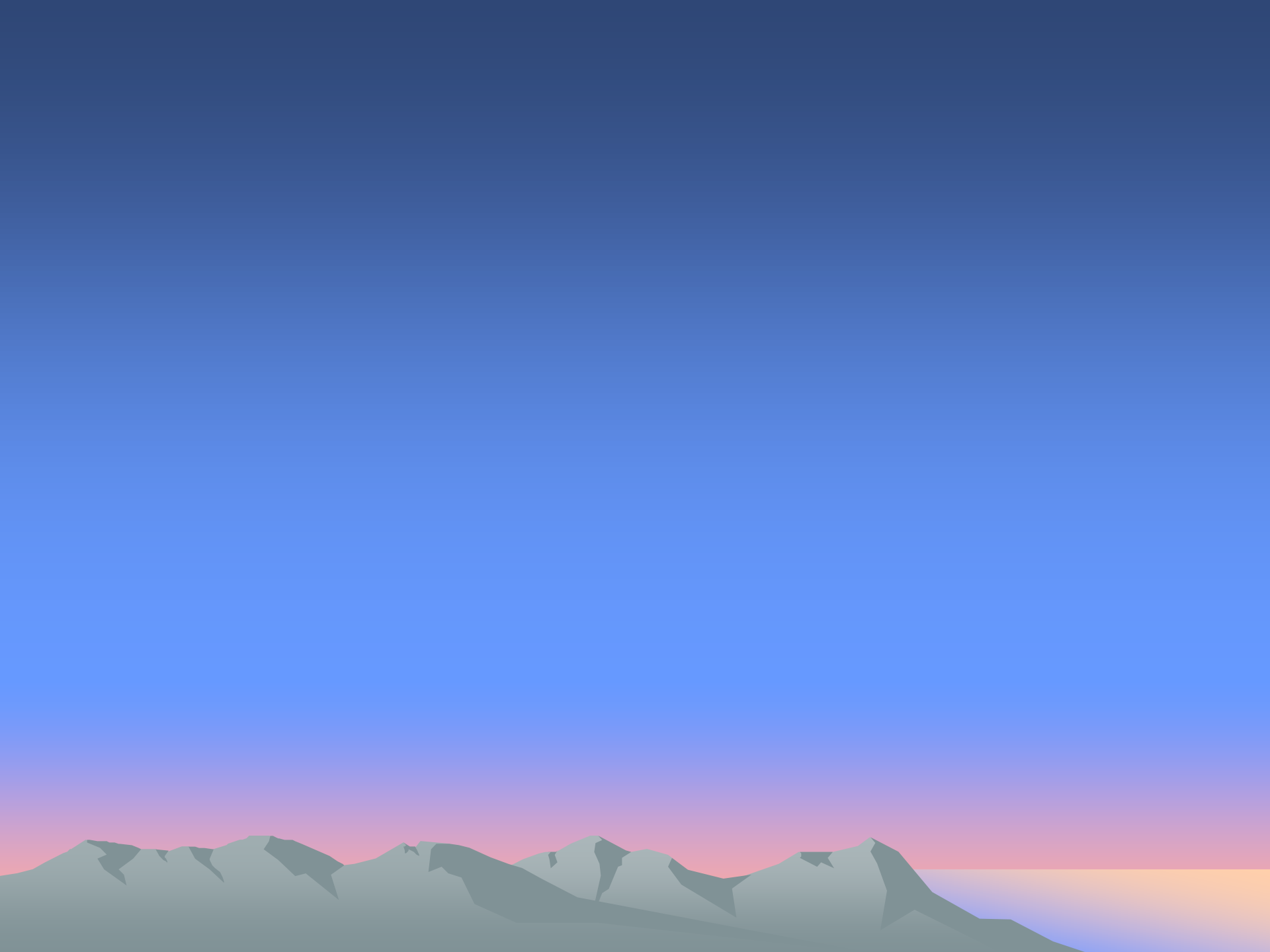


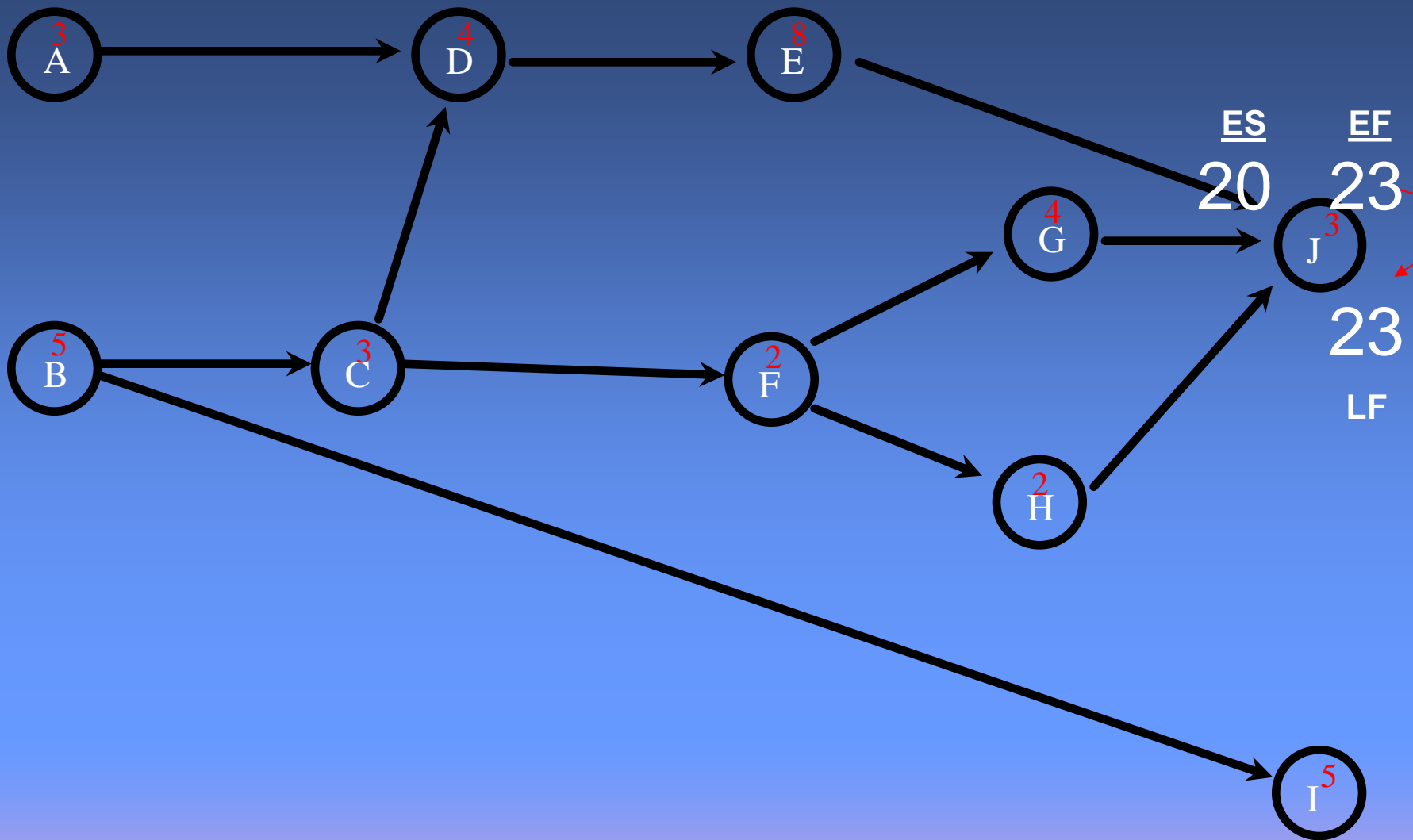


Late Start/Late Finish (LS/LF)

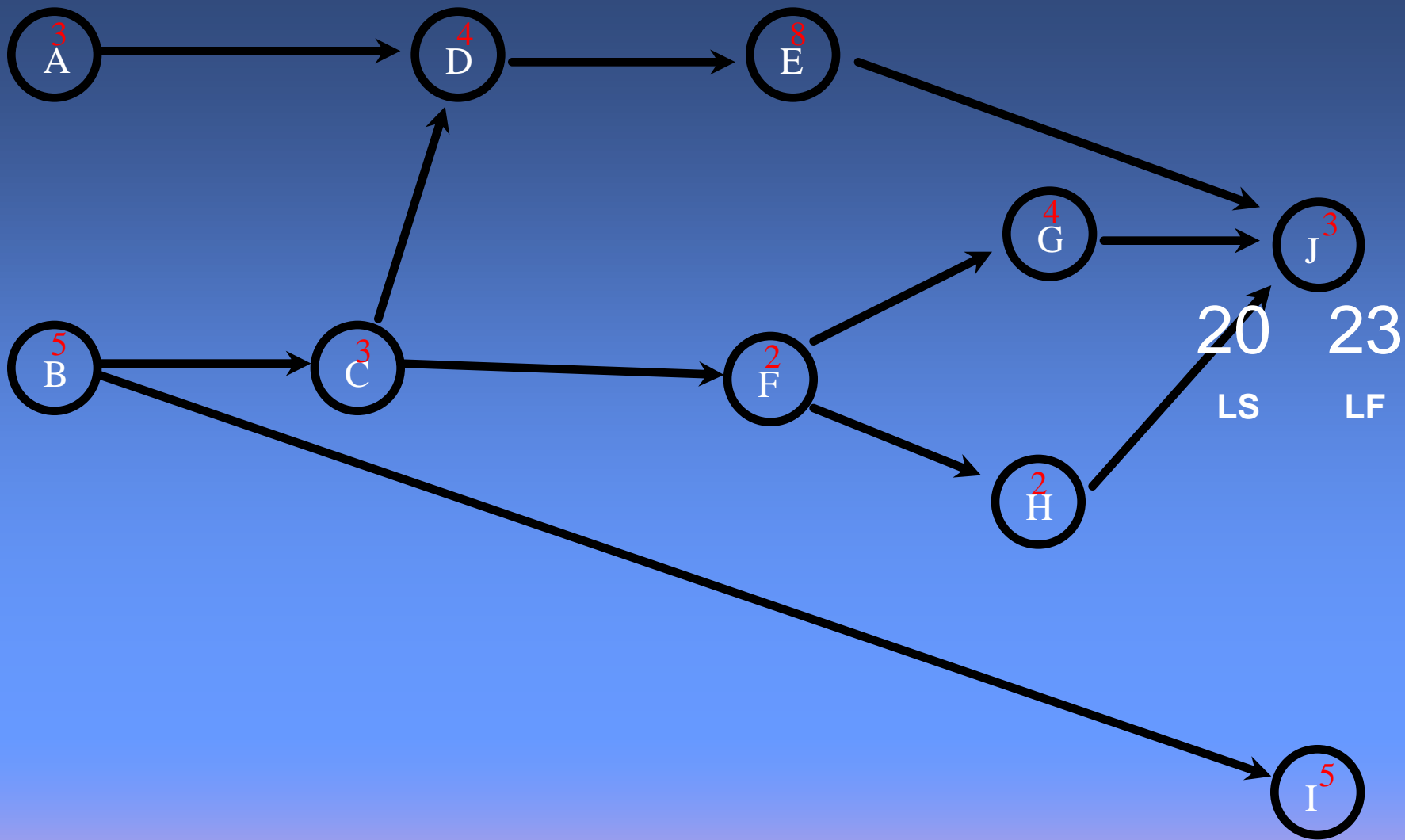
- The latest an activity can start and finish (without delaying the project)
- If last activity, $LF = EF$ of last activity on critical path
- $LF = \text{minimum } LS \text{ of successors}$
- $LS = LF - \text{activity duration}$

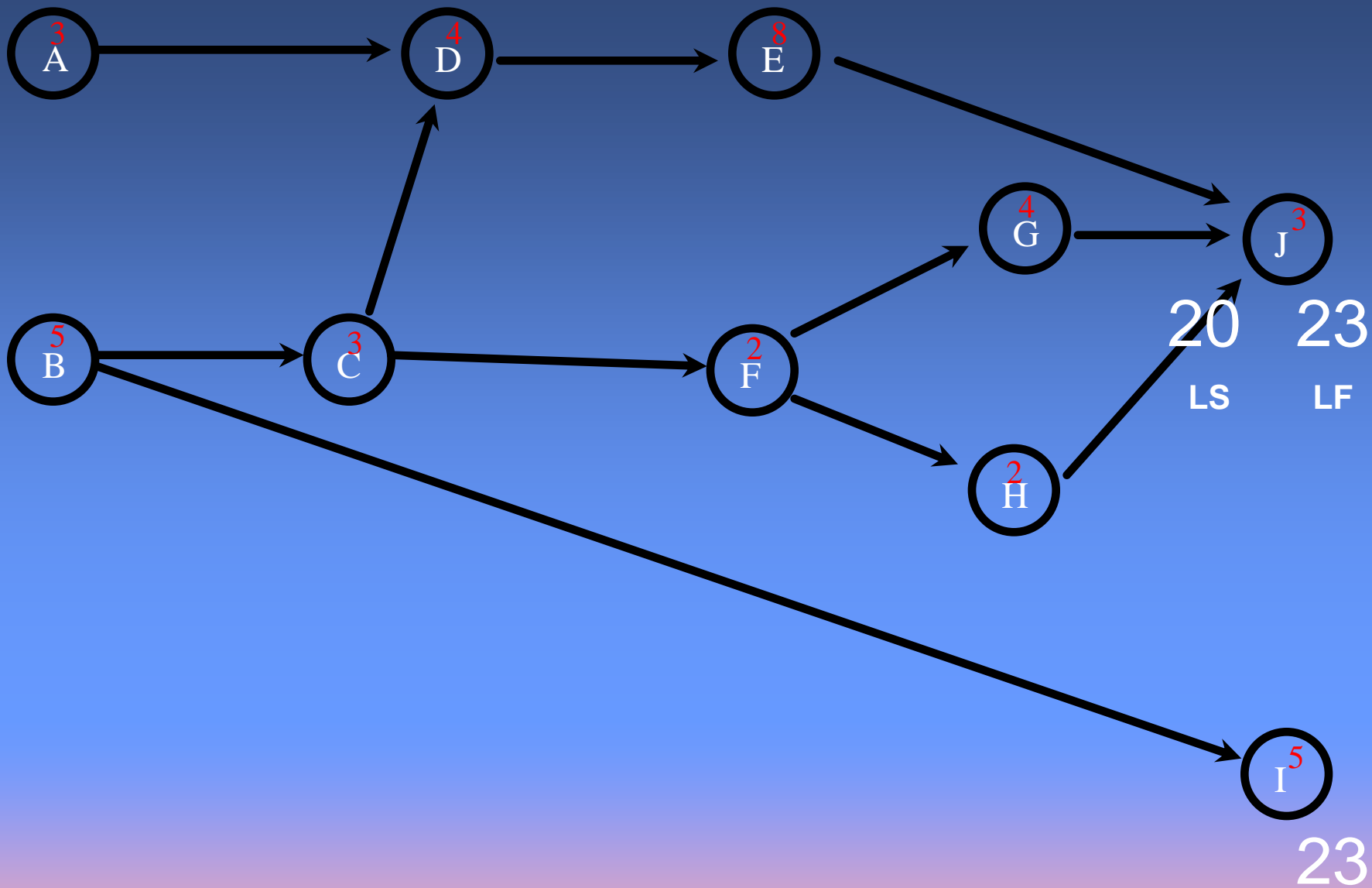
**Work backwards
through time**

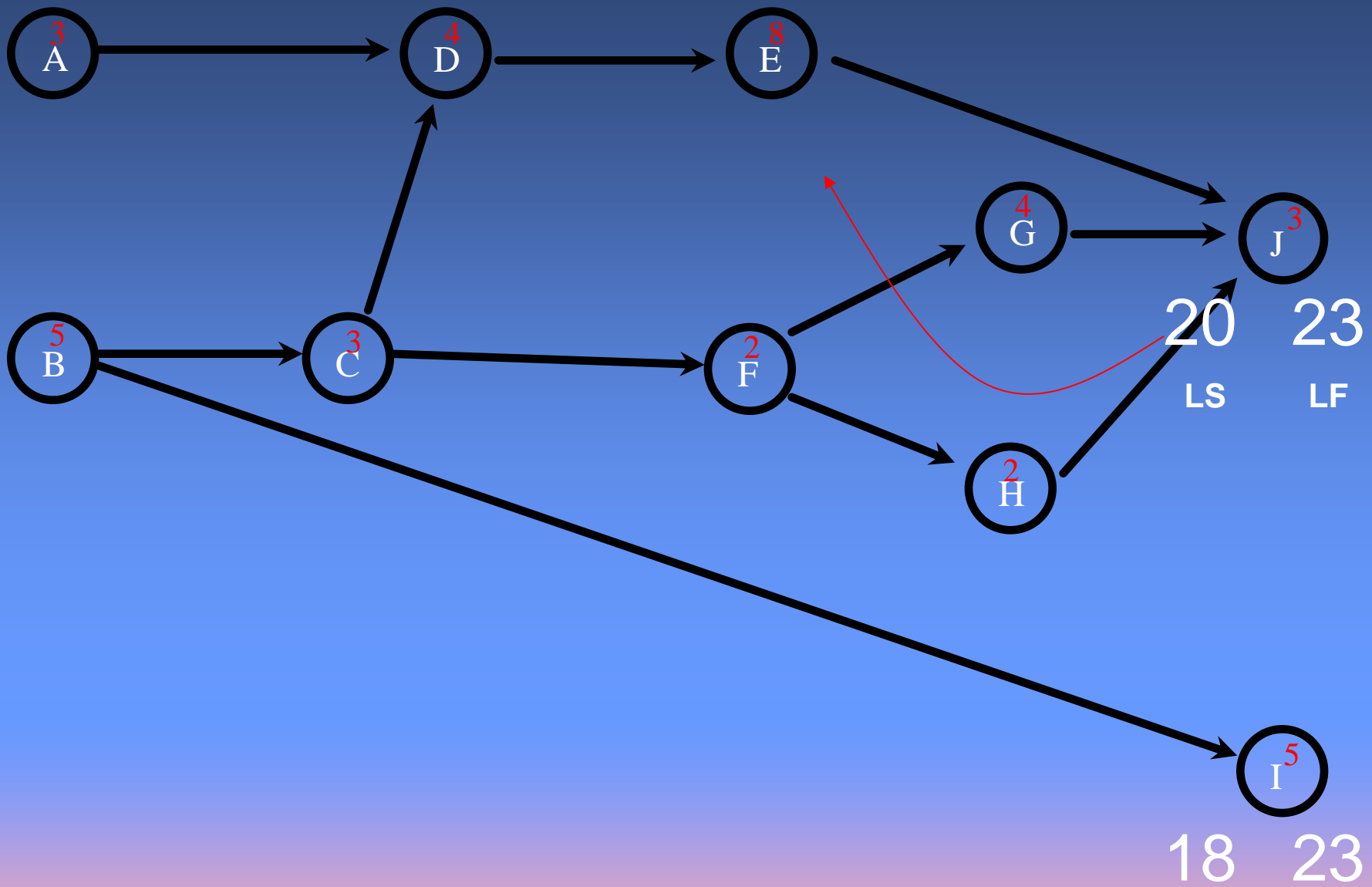


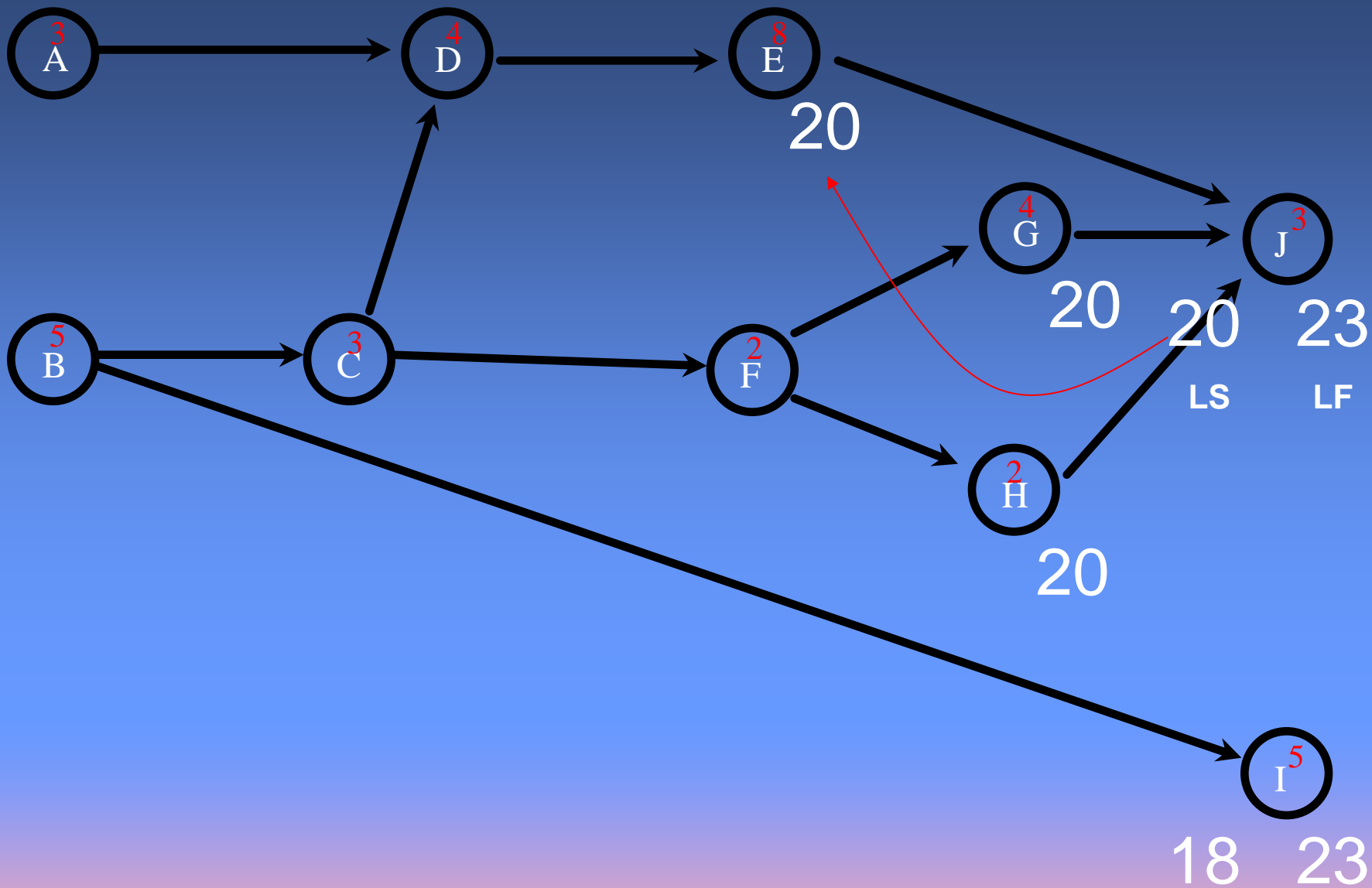


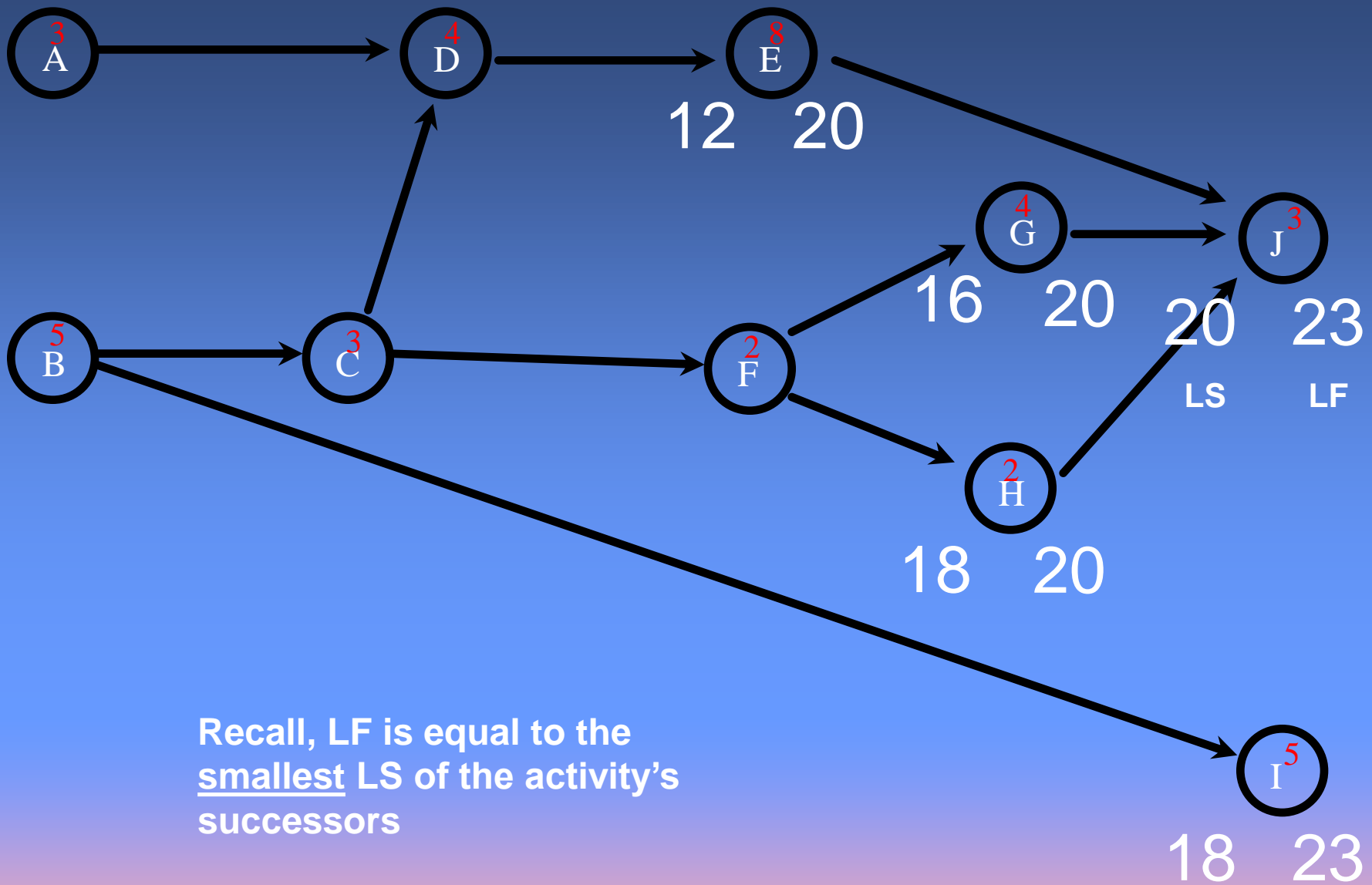
**Remember: at the last activity,
LF = EF of last activity on Critical Path**

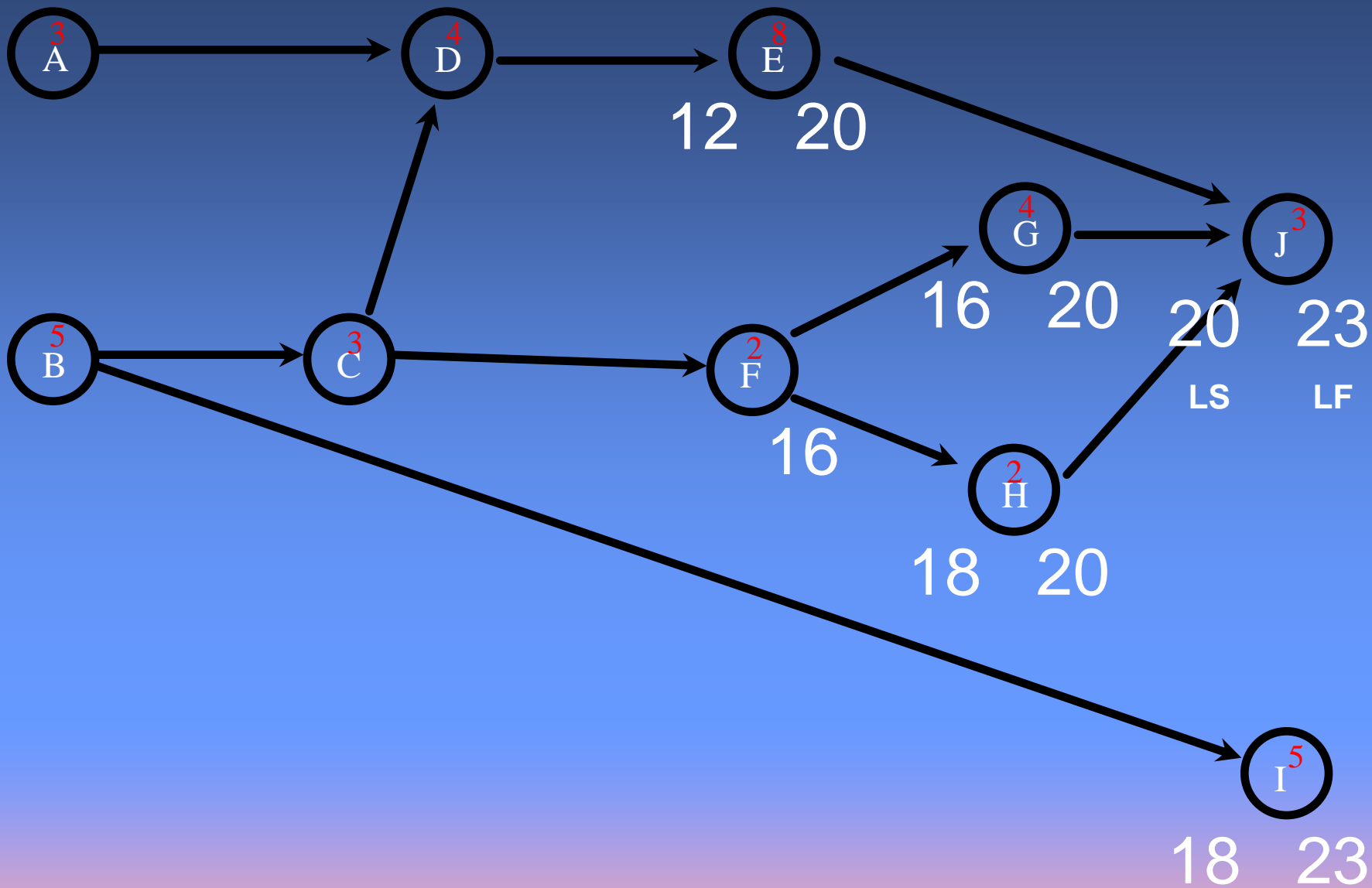


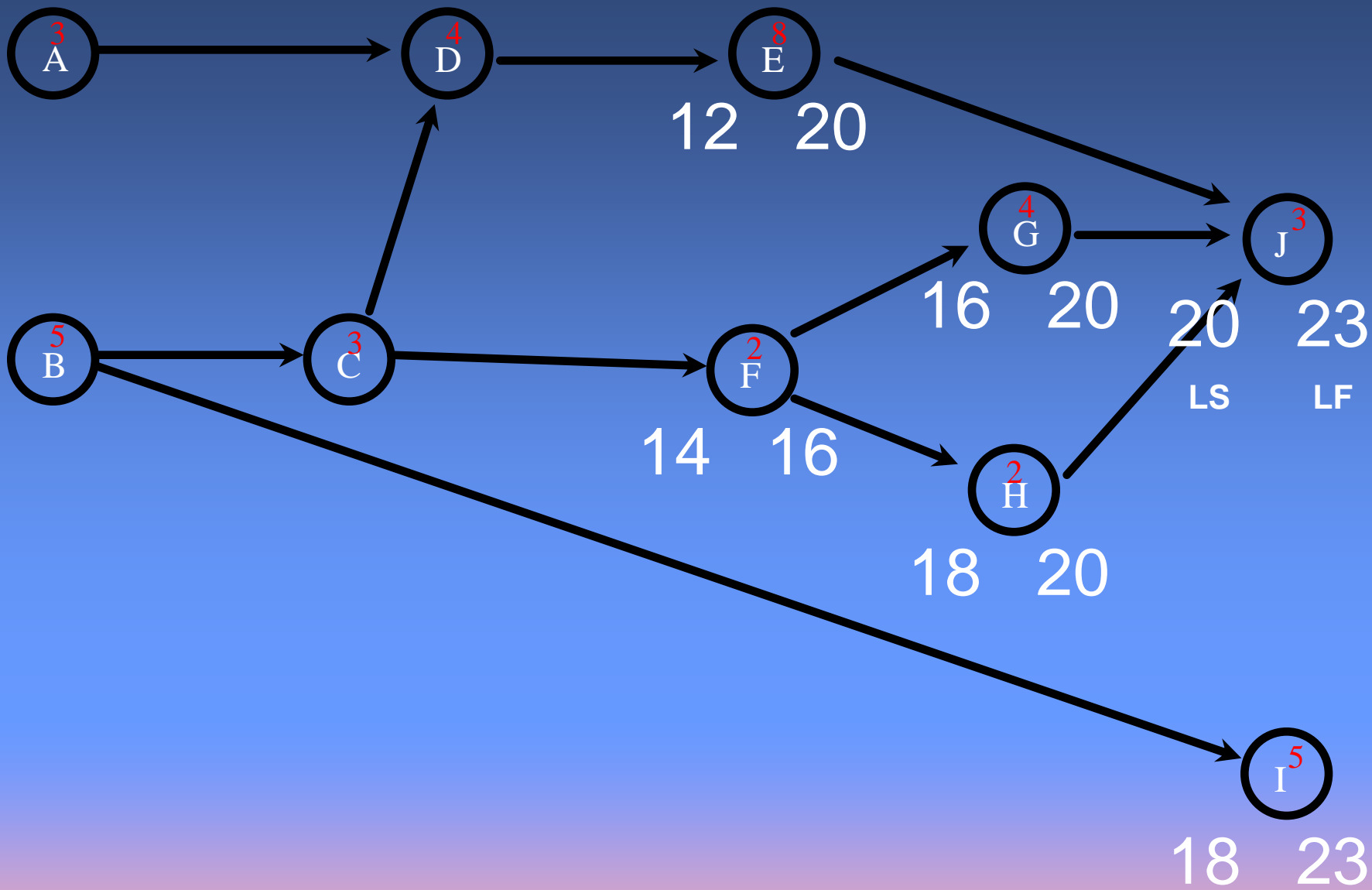


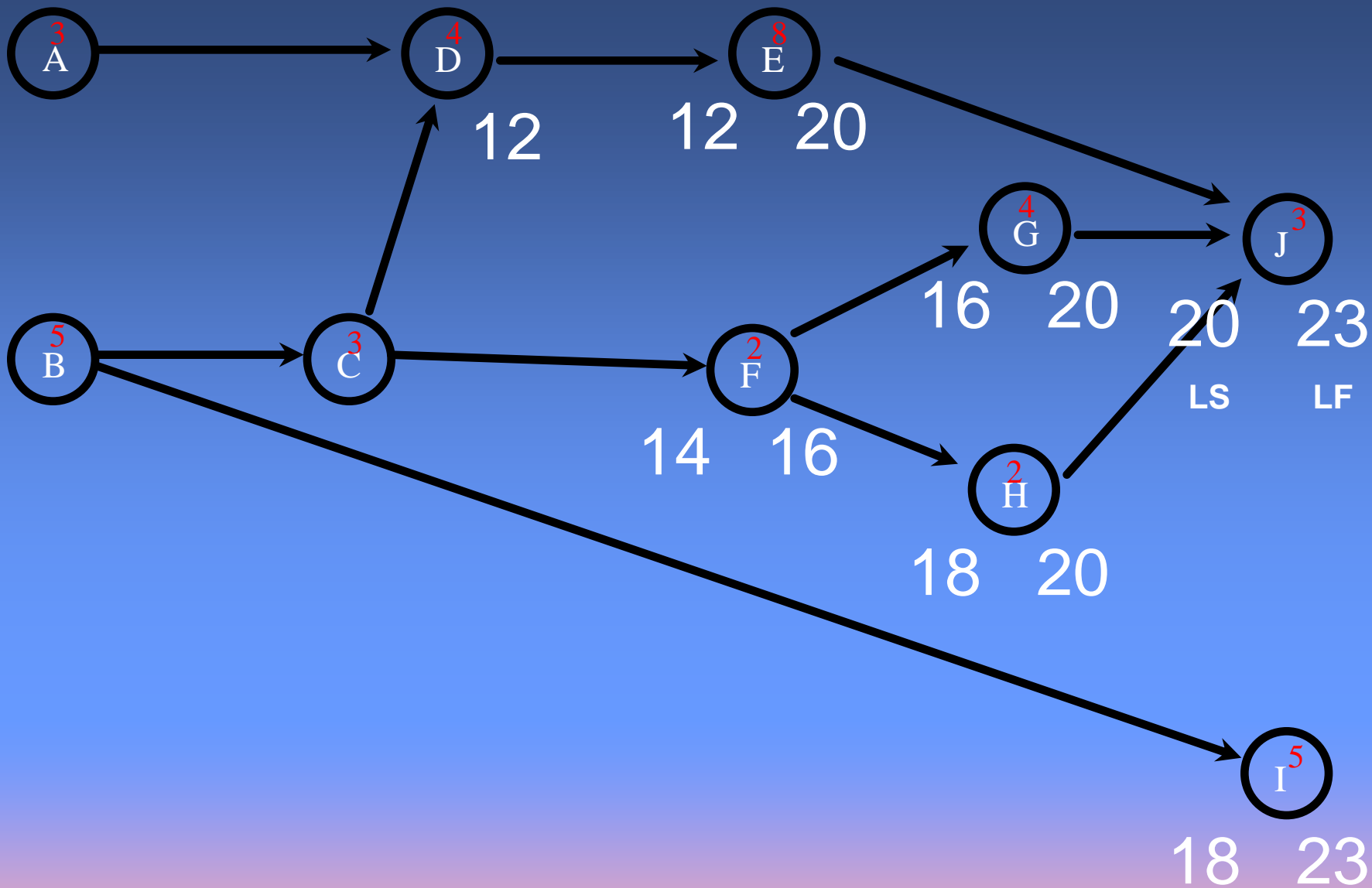


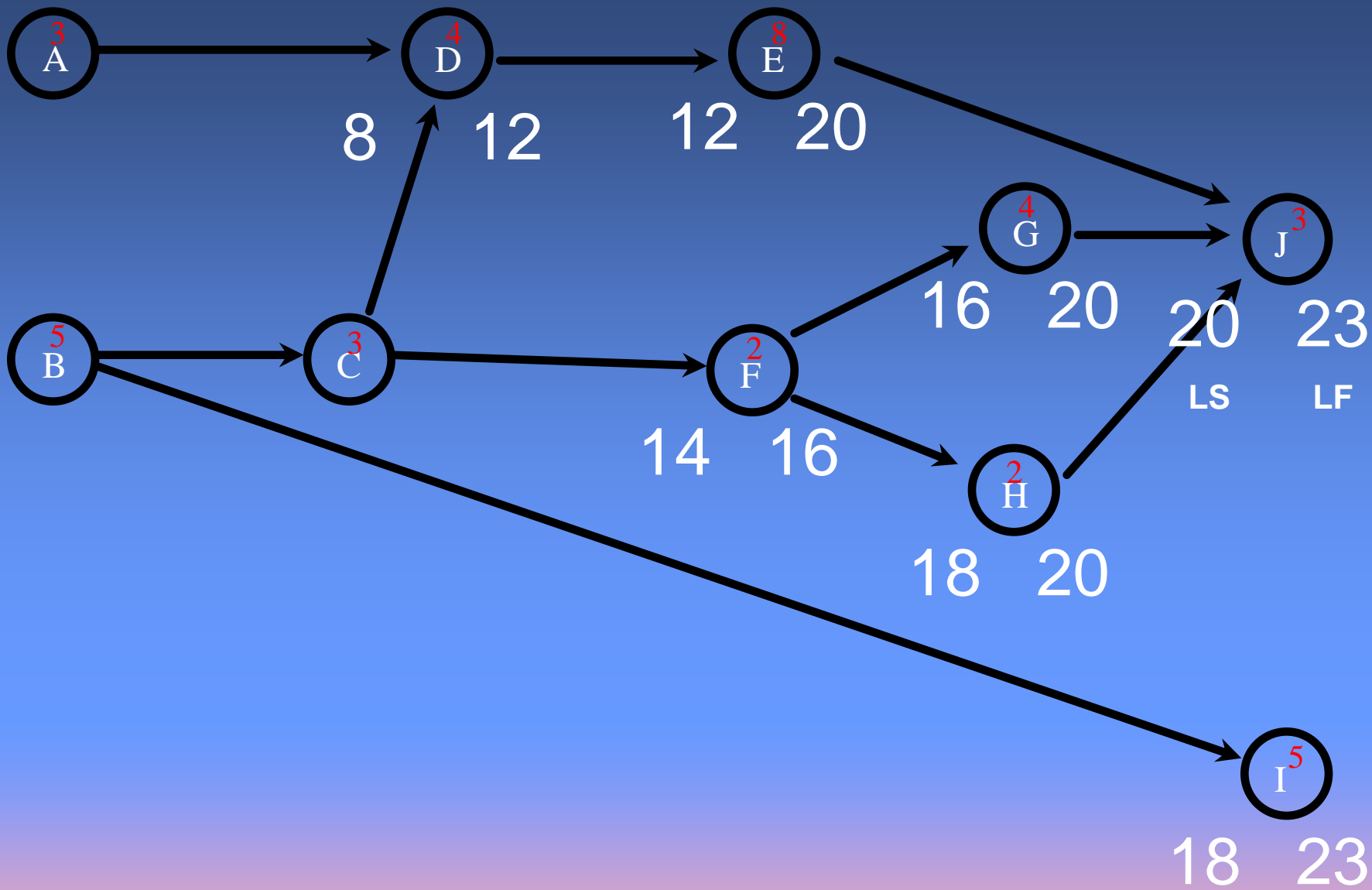


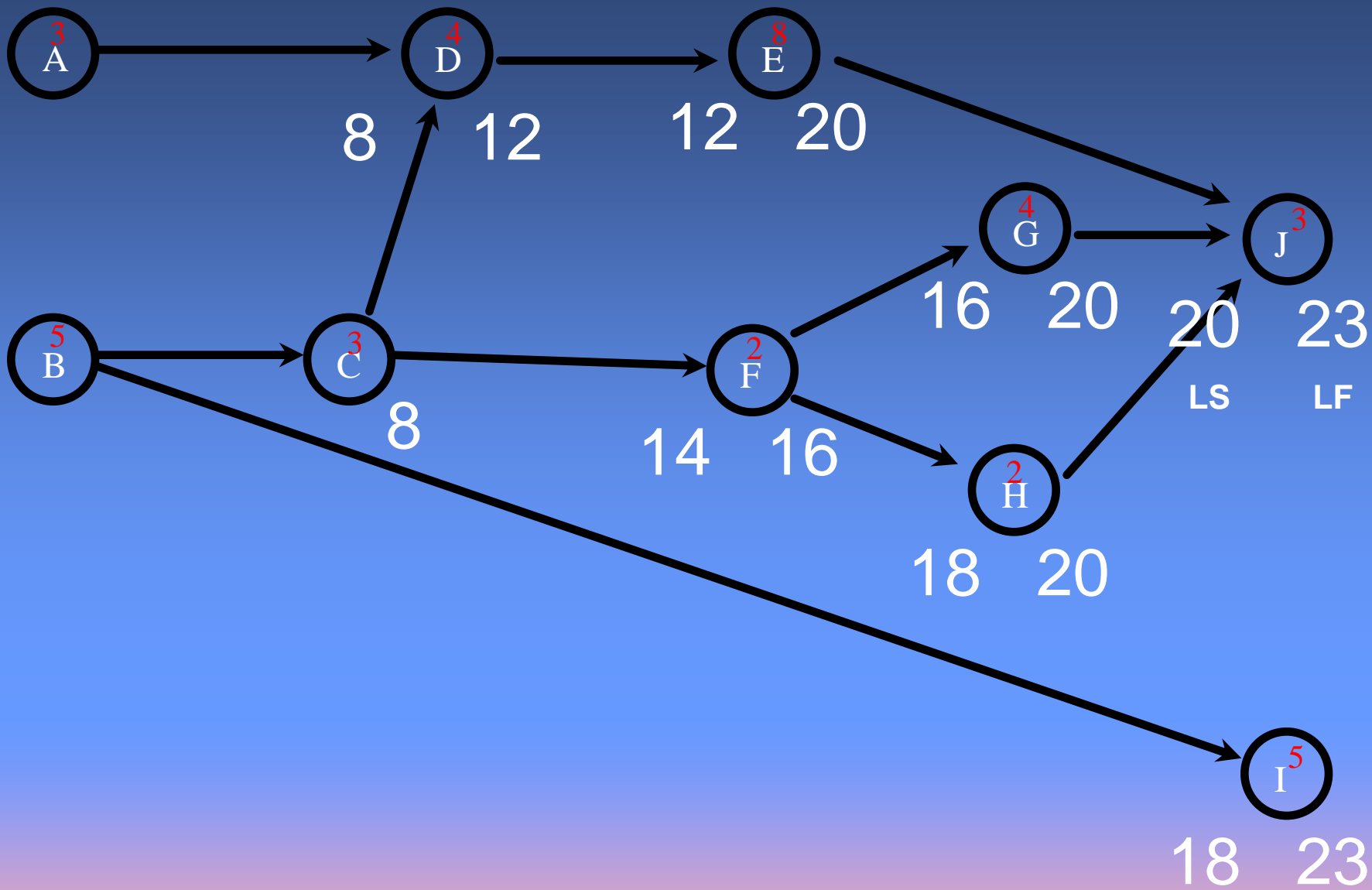


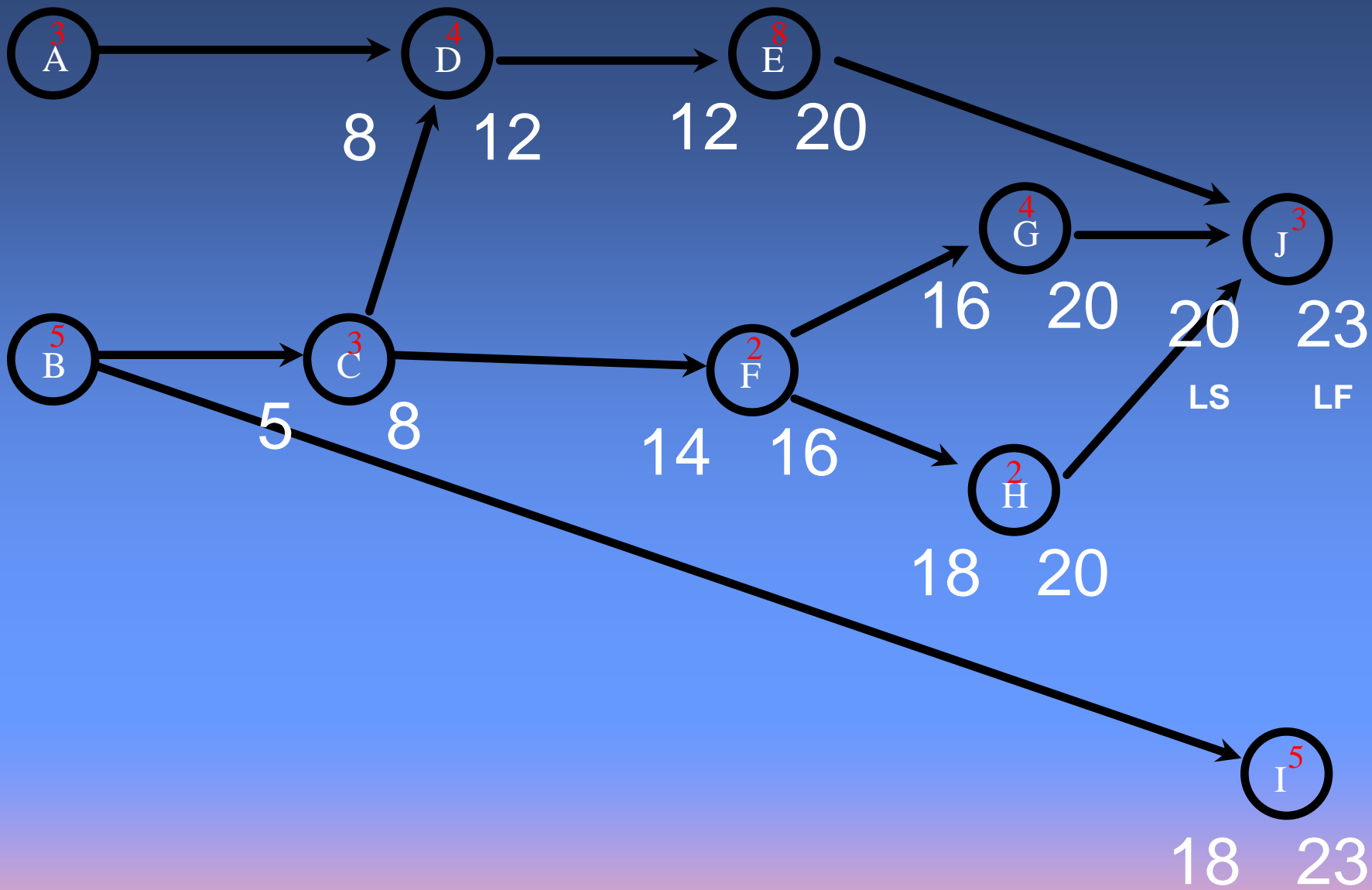


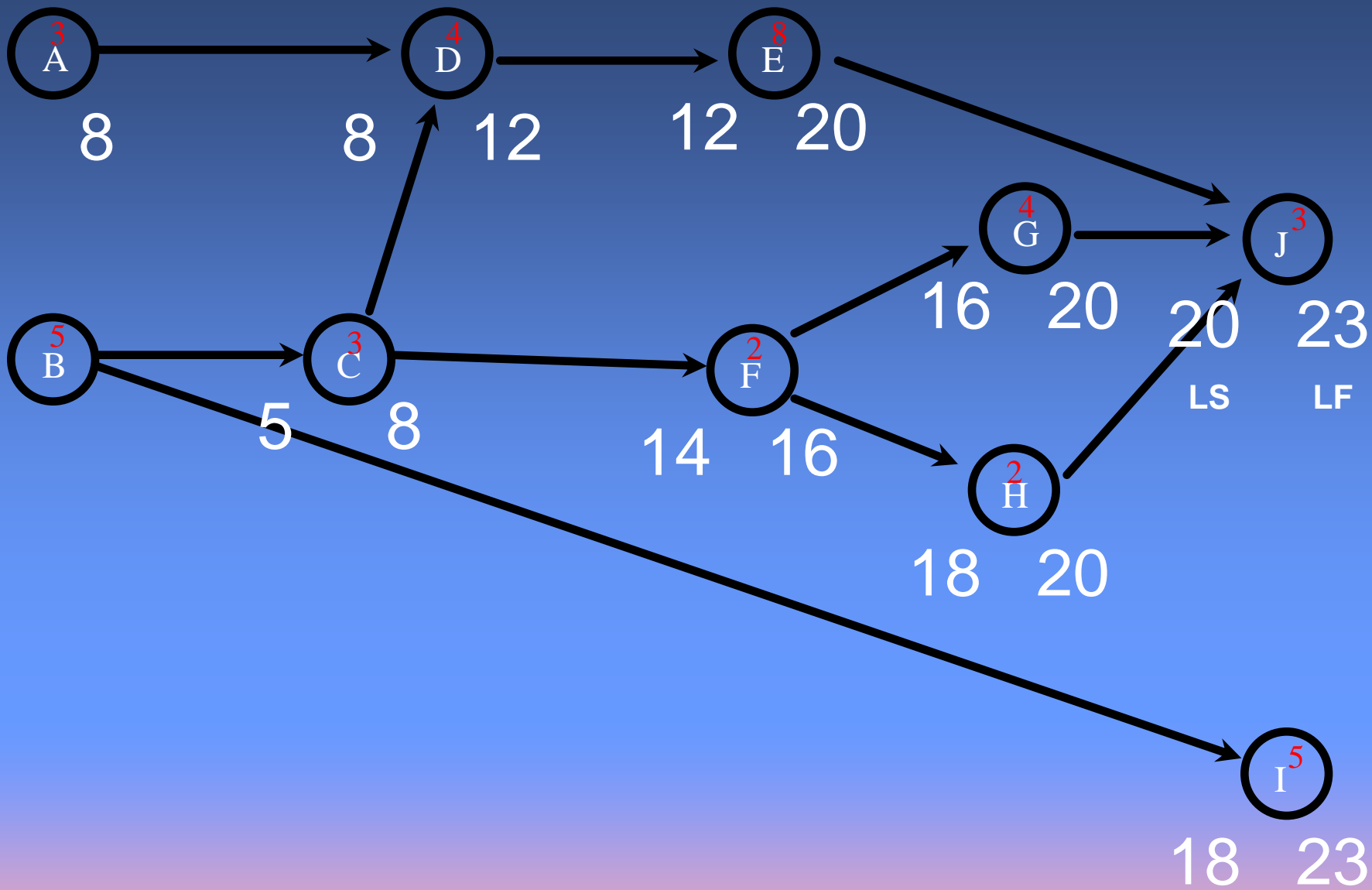


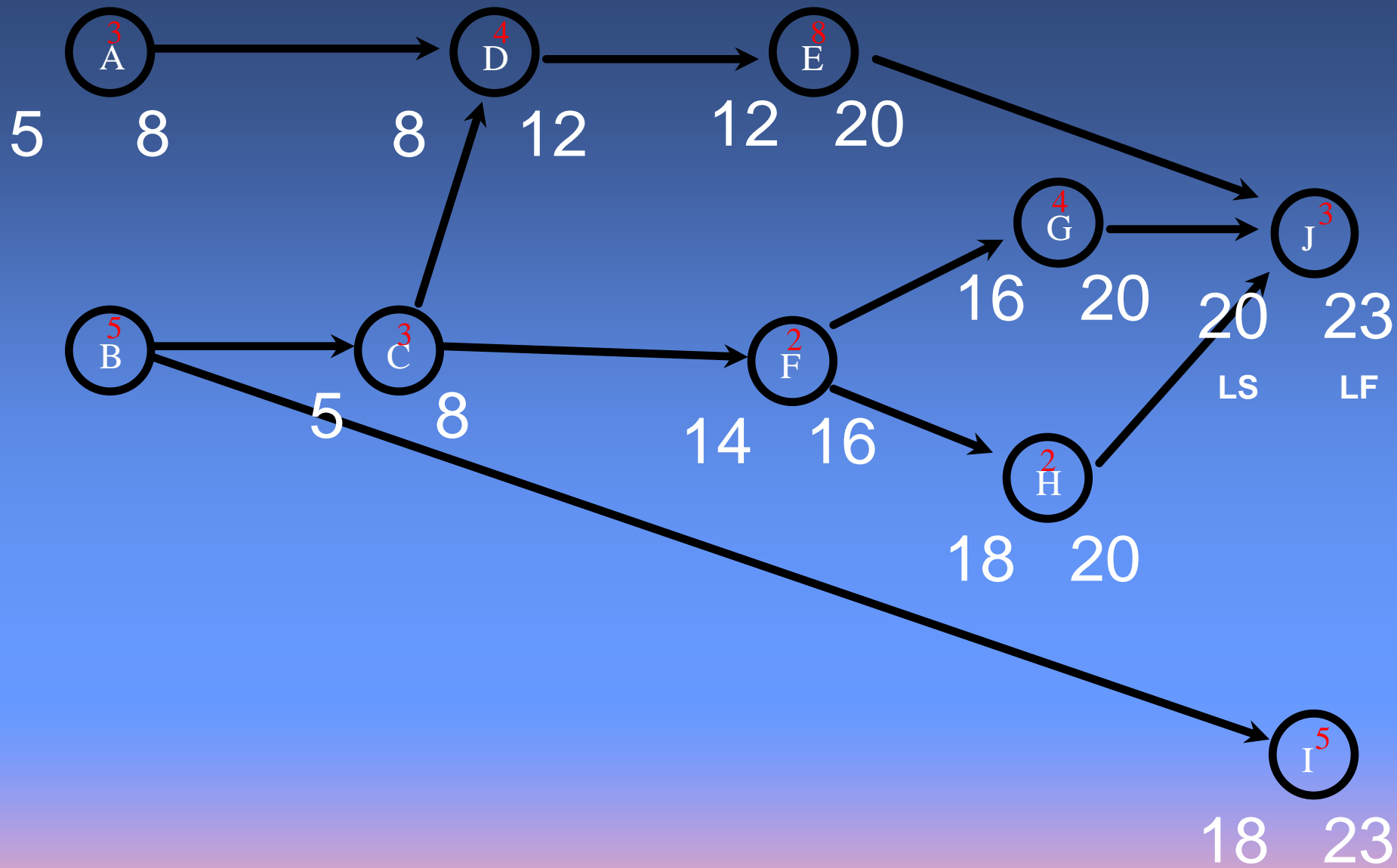


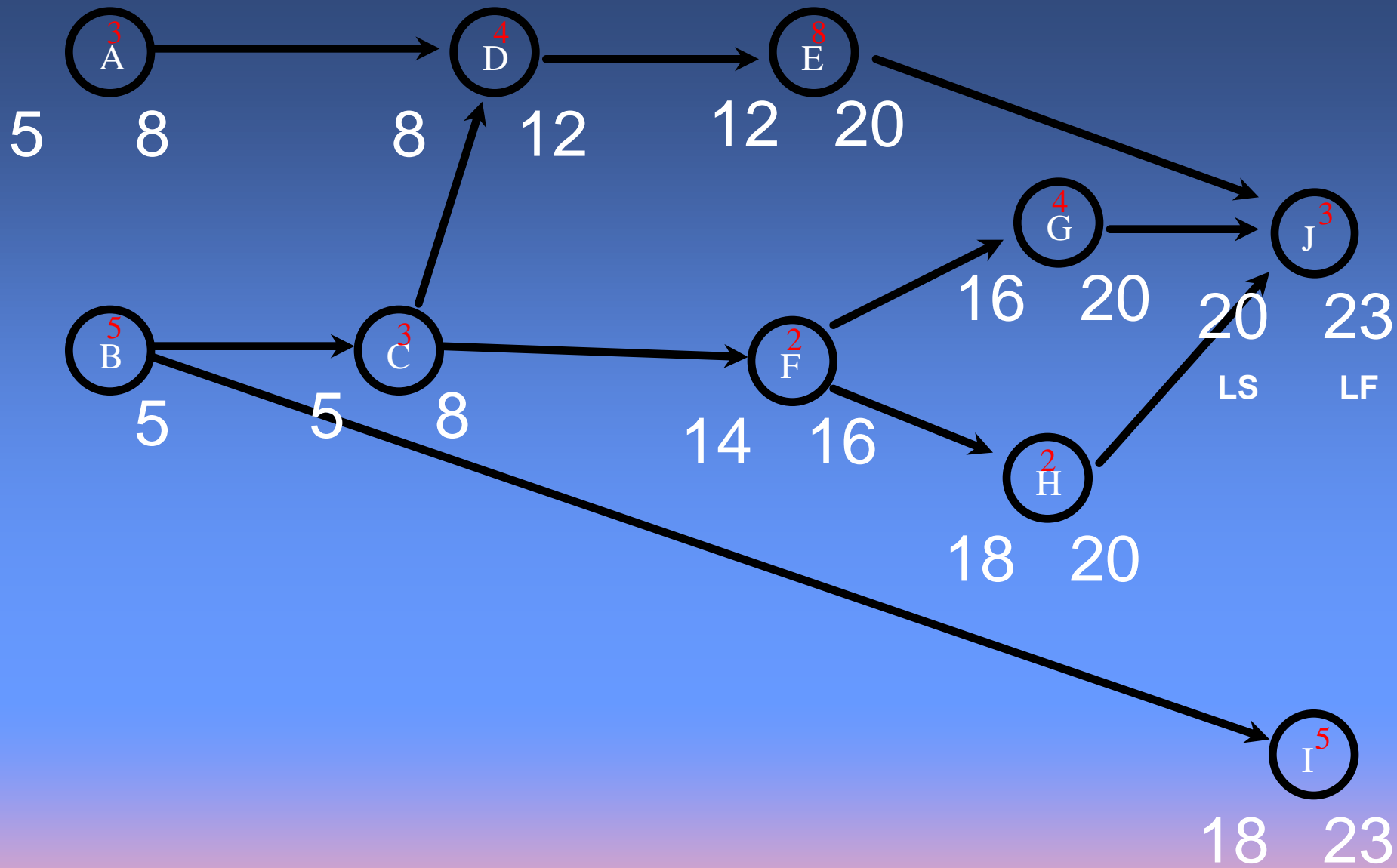


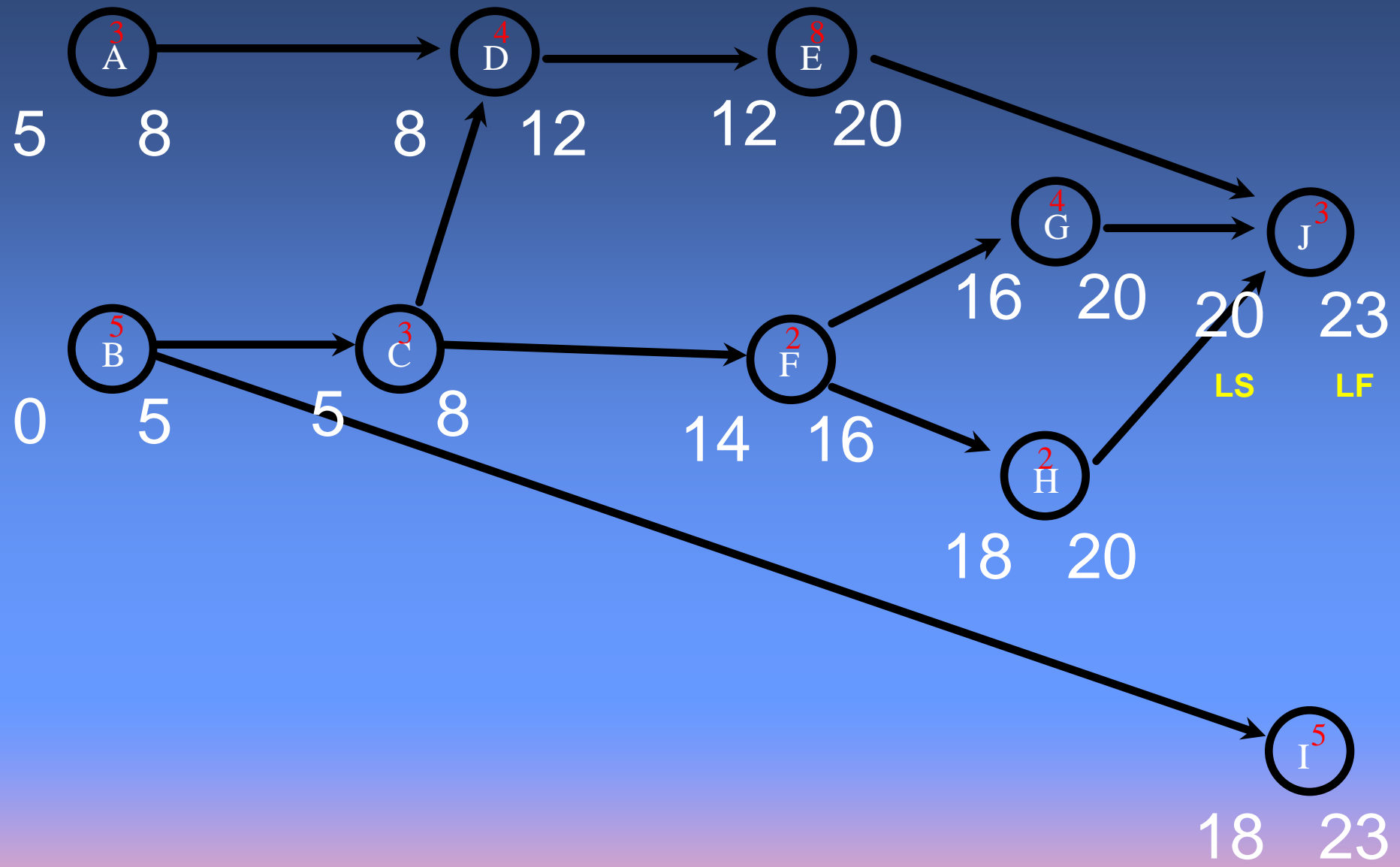


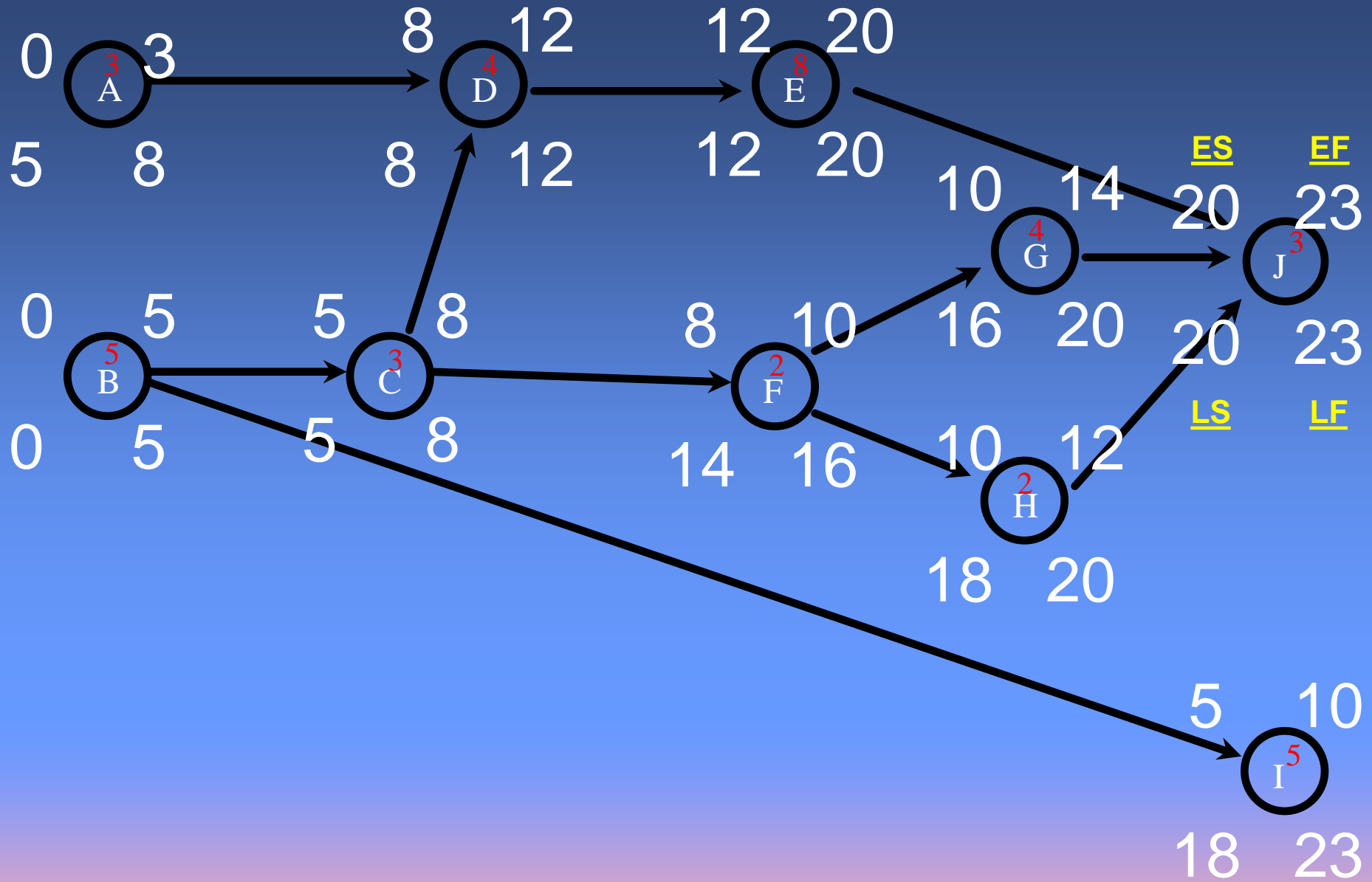


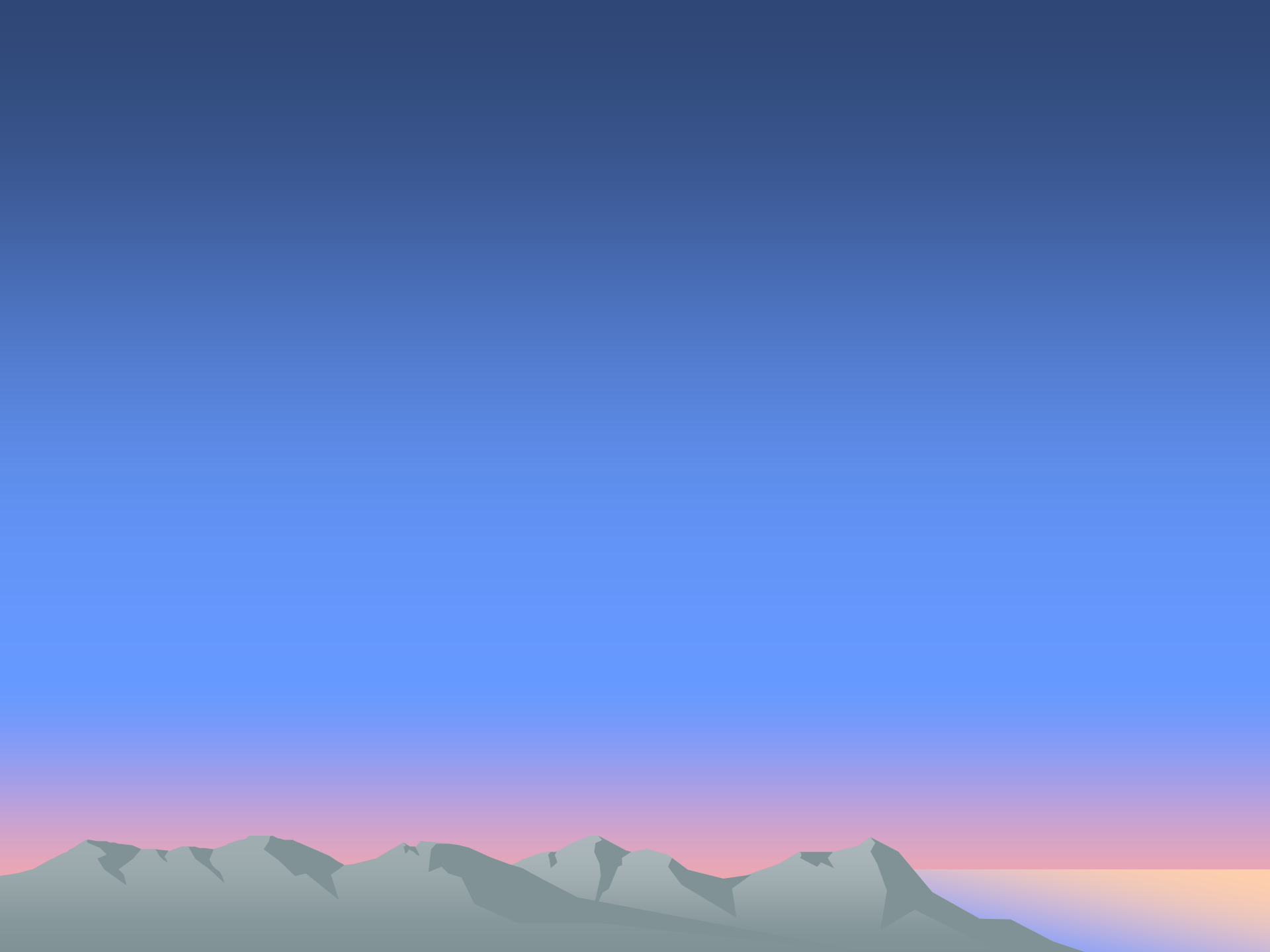






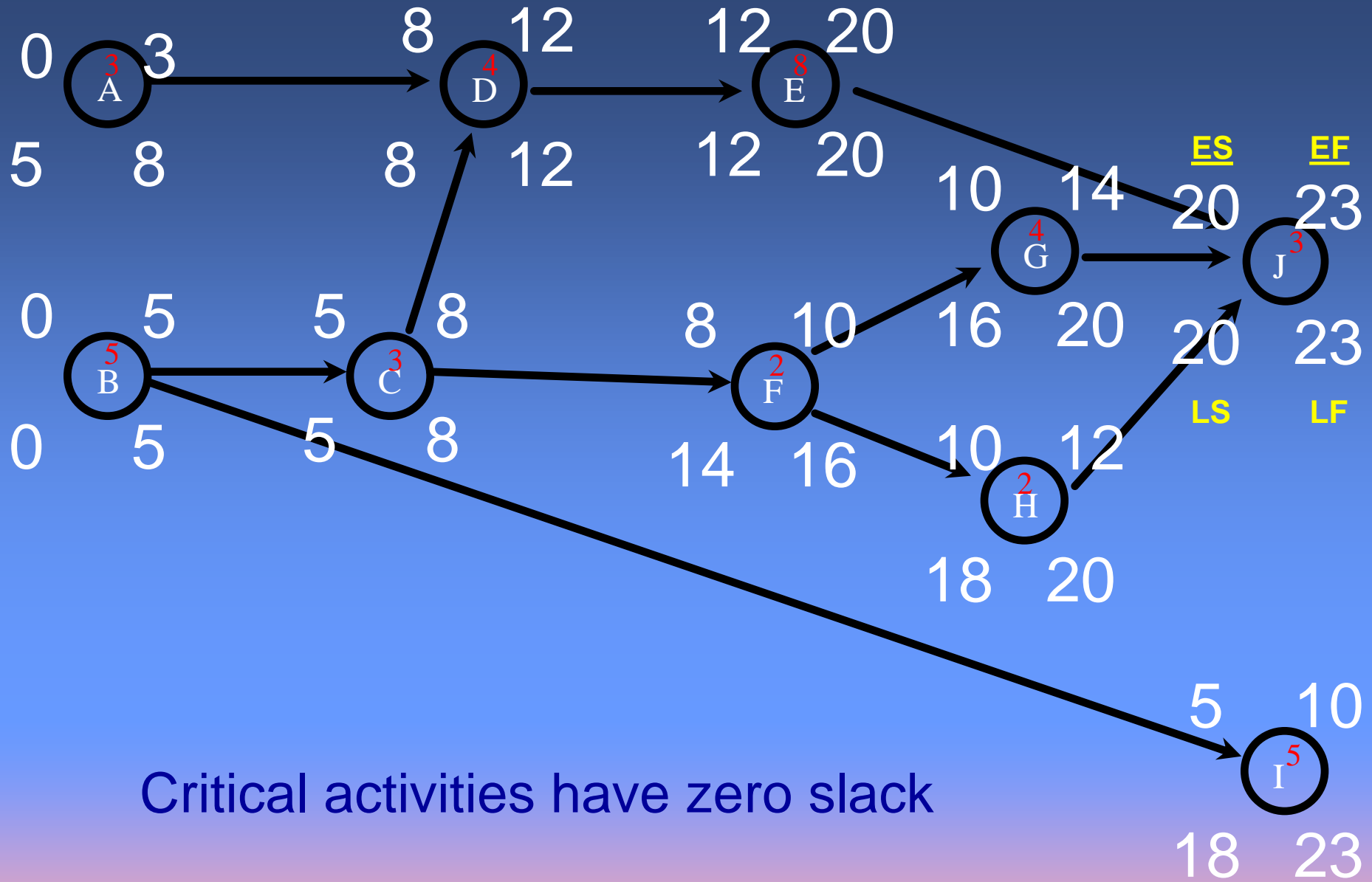


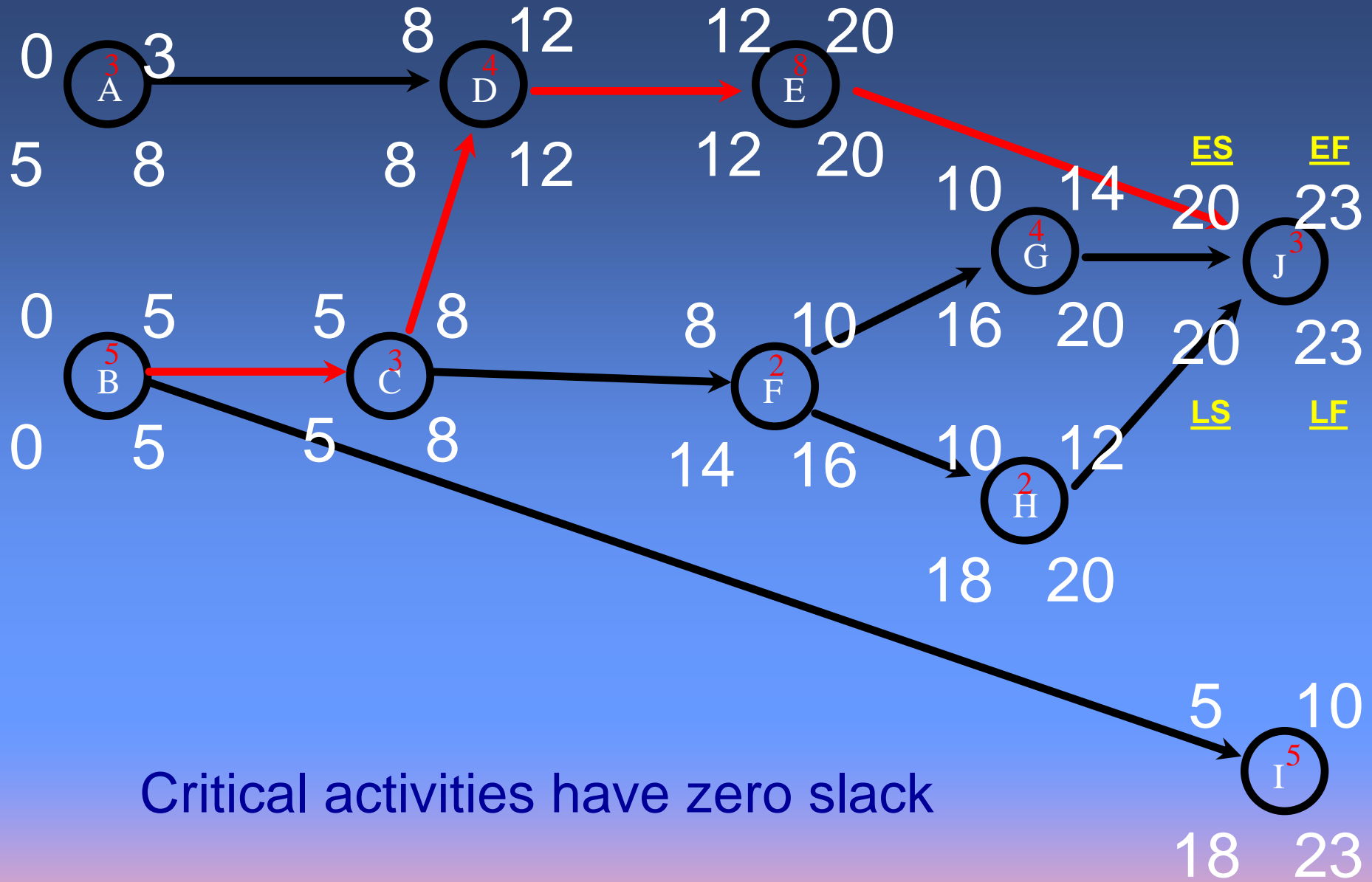




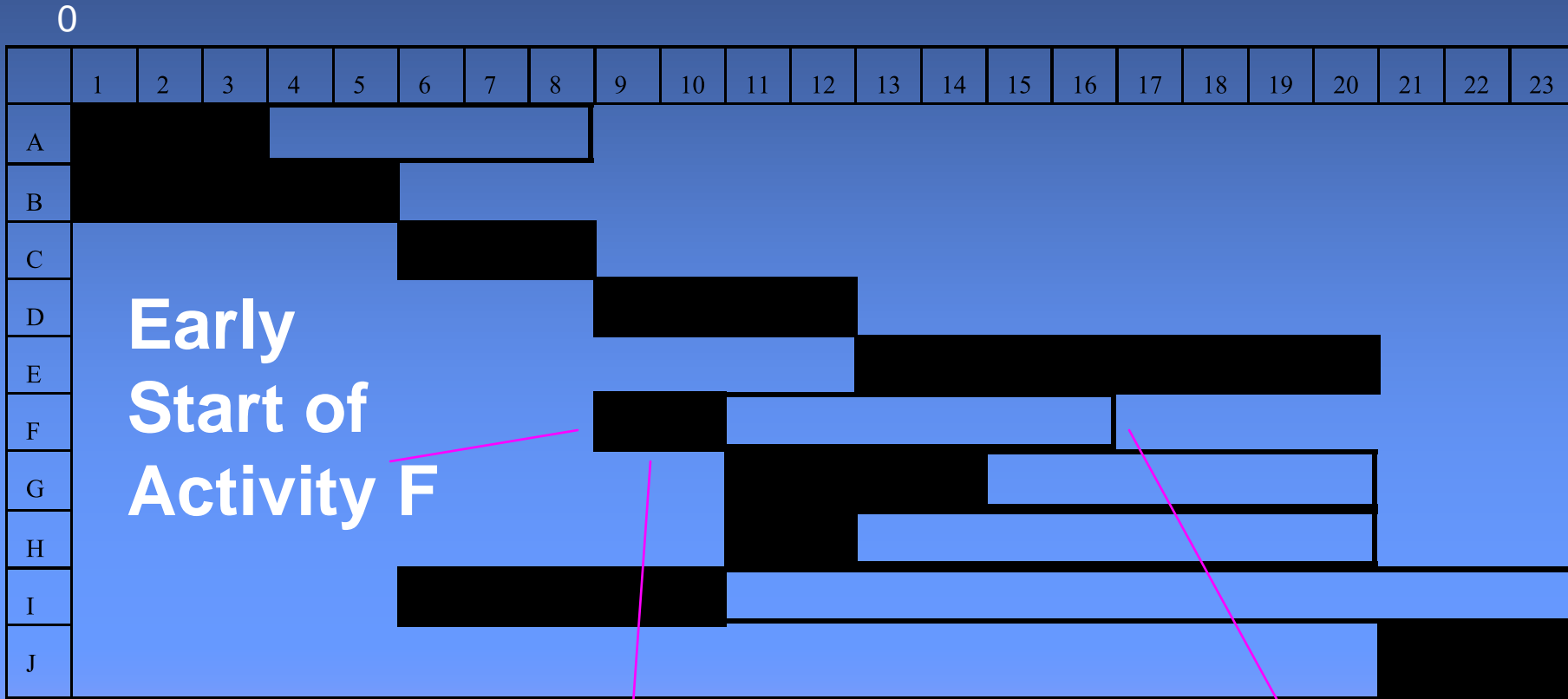
Slack

- The most you can delay an activity without delaying the project
- $Slack = LS - ES = LF - EF$
- Critical activities have zero slack
- Helps to set priorities, scrutiny of management





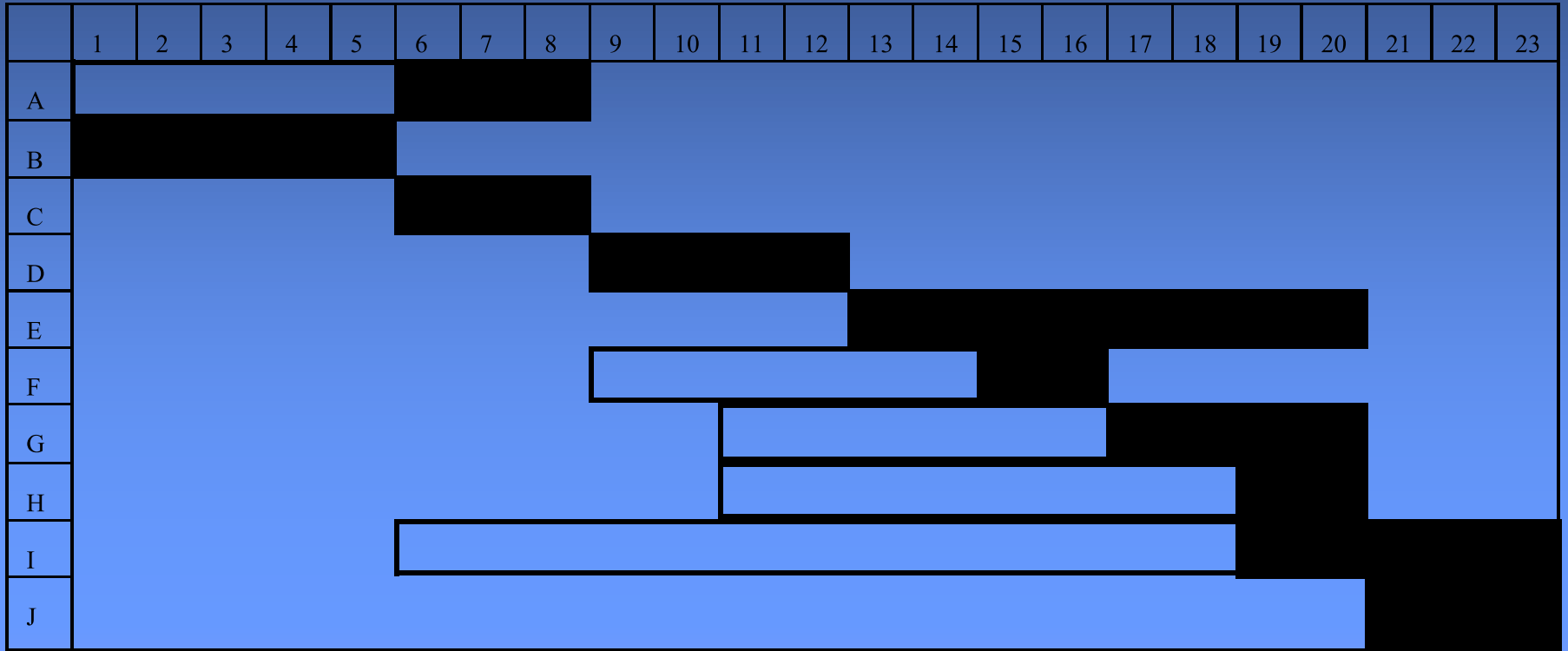
Gantt Chart: Early Start/Finish

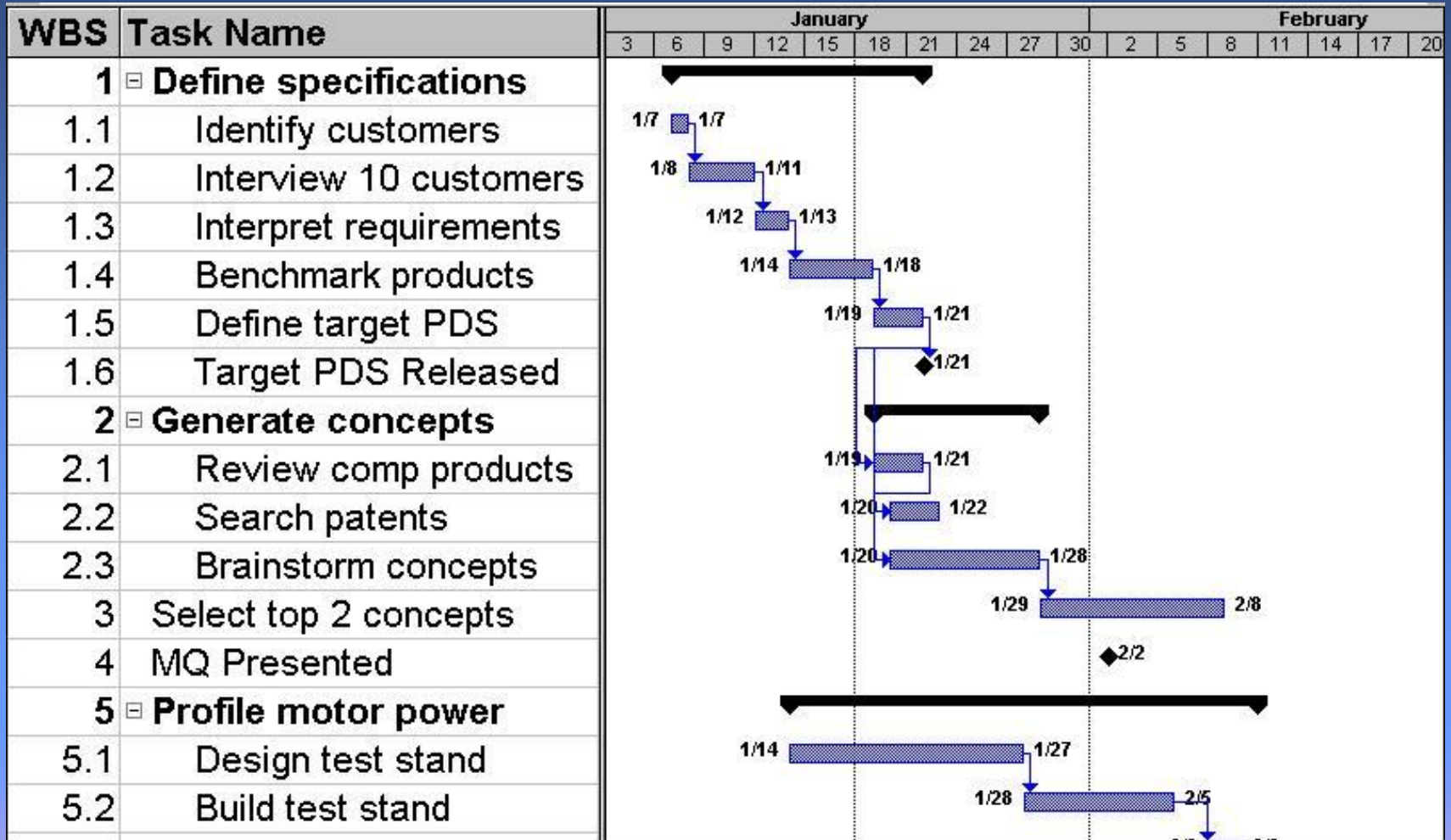


Scheduled
Time of
Activity F

Late Finish
of Activity F

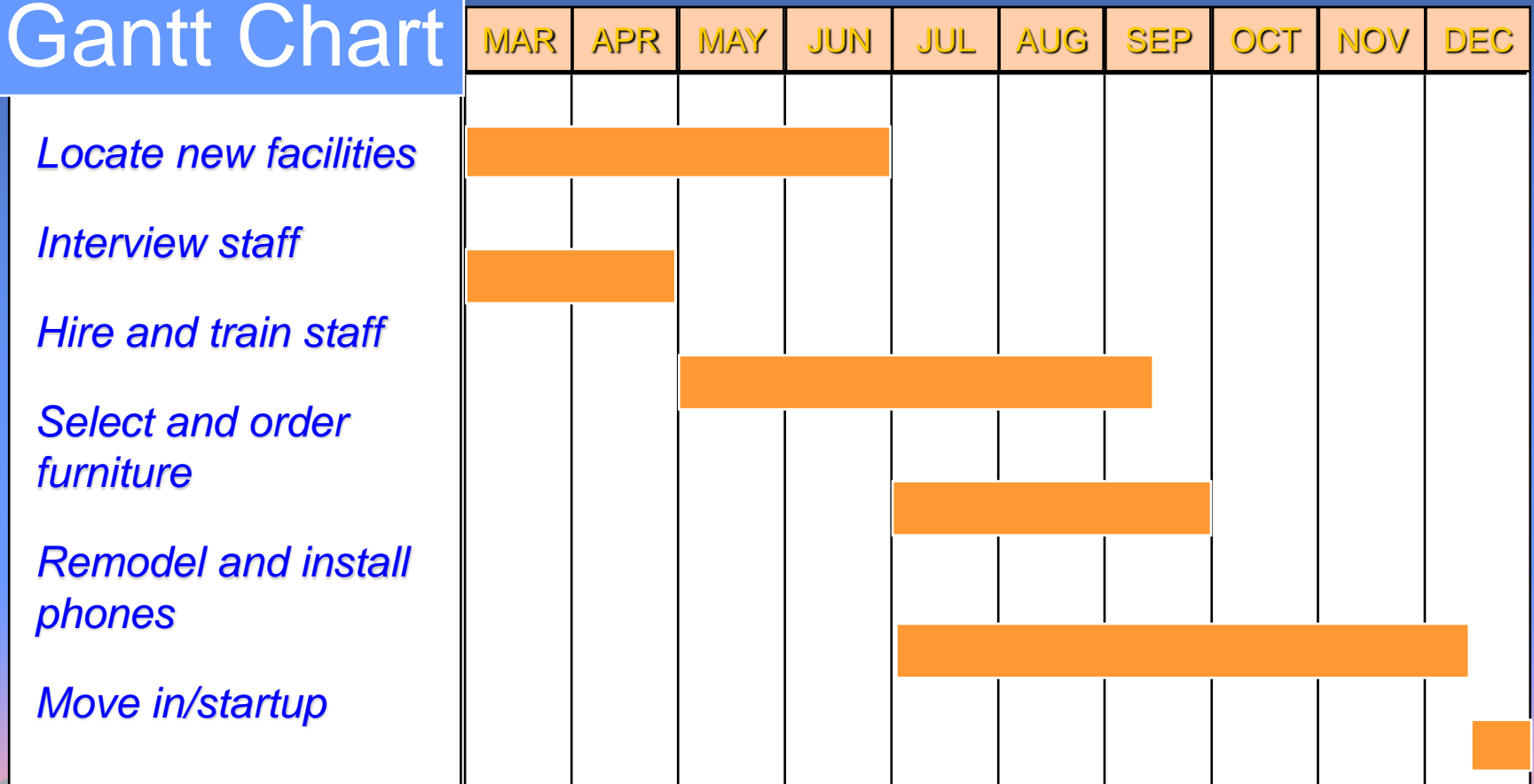
Gantt Chart: Late Start/Finish





Project Control

Gantt Chart



Ten Golden Rules of Project Management

1. Don't bite off more than you can manage.
2. Get your ducks in a row.
3. Plan for Murphy. (Murphy's Law-"If something can go wrong, it will go wrong.")
4. Don't put off until tomorrow.
5. Delegate, Delegate, Delegate.
6. CYA-Document.
7. Keep your team in the loop.
8. Measure success.
9. Have a flexible strategy.
10. Learn from your mistakes.

Summary

- Characteristics of a Project
- Three Items to be Managed with a Project
- Key Segments
- CPM - PERT
- Slack
- Gantt Charts