MONASH University

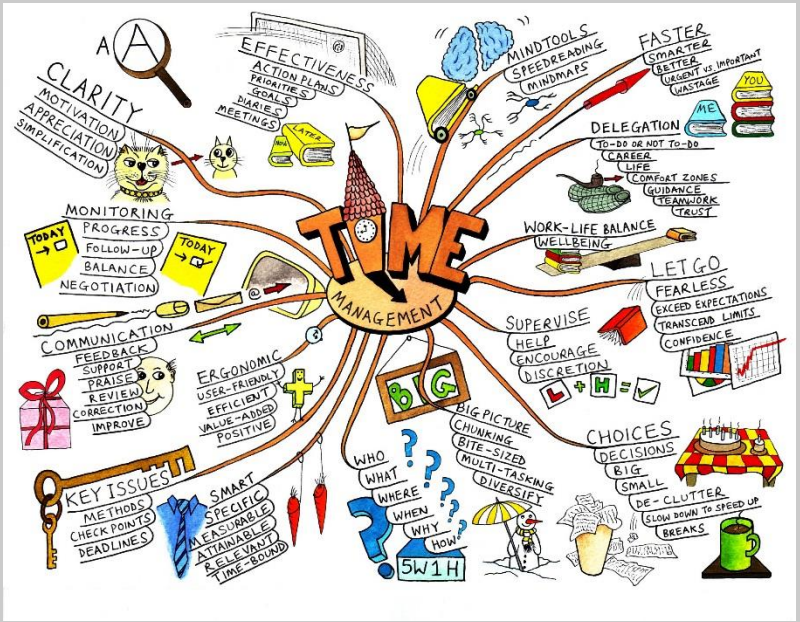
GROUP OF EIGHT AUSTRALIA

Information Technology

FIT2002

Week 5 Seminar

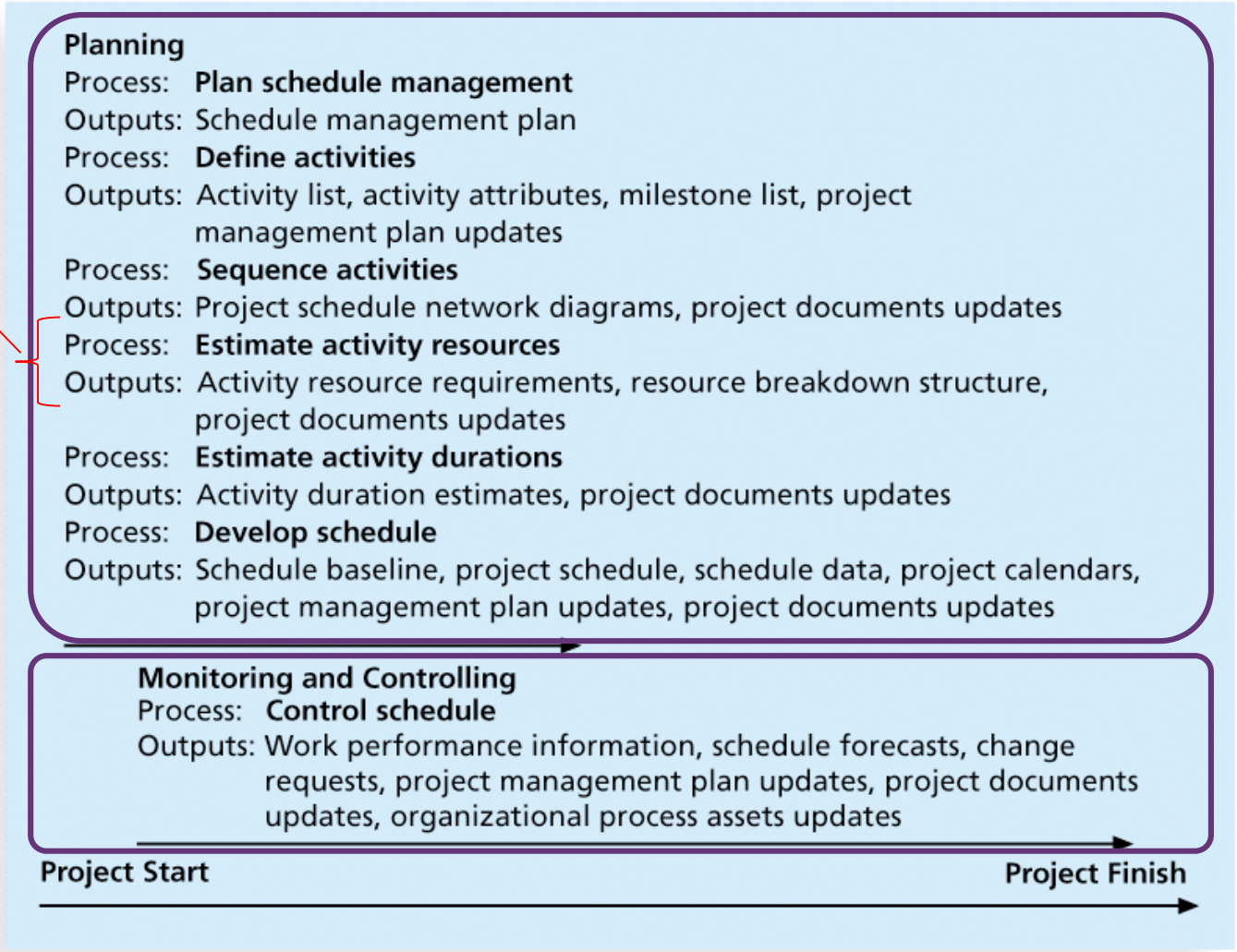
Project Schedule Management



http://www.timemanagementpptsite.com/

Project Schedule Management Summary

Estimate activity resources – this process is now moved to Project Resource Management in the new PMBOK 6th Edition



Recap:

1. **Planning schedule management** involves determining the policies, procedures, and documentation that will be used for planning, executing, and controlling the project schedule.
   - The main output is a schedule management plan.
2. **Defining activities** involves identifying the specific activities that must be completed to produce the project deliverables.
   - It usually results in a more detailed WBS.
3. **Sequencing activities** determines the relationships or dependencies between activities.
   - Three reasons for creating relationships:
     - mandatory based on the nature of the work,
     - discretionary based on the project team's experience, or
     - external based on non-project activities.

Recap (cont..)

- Activity sequencing must be done in order to use **critical path analysis**.
- **Network diagrams** are the preferred technique for showing activity sequencing. The two methods used:
  - the **arrow diagramming method** (=activity-on-arrow) and
  - the **precedence diagramming method**. (=activity-on-node)
- There are four types of relationships between tasks:
  - **finish-to-start, finish-to-finish, start-to-start,** and **start-to-finish**.

Recap (cont..)

4. **Estimating activity resources** involves determining the quantity and type of resources (people, equipment, and materials) that will be assigned to each activity.
5. **Estimating activity durations** creates estimates for the amount of time it will take to complete each activity. These time estimates include the actual amount of time worked plus elapsed time.
6. **Developing the schedule** uses results from all of the other project time management processes to determine the start and end dates for the project.
   - Gantt charts often used to display the project schedule.
   - Tracking Gantt charts show planned and actual schedule information.
7. **Controlling the schedule** – keeping track of status of the schedule, influence factors that cause schedule changes, determine if schedule has changed, and manage changes when they occur

Recap (cont..)

- The **critical path method** predicts total project duration.
- The critical path for a project is the series of activities that determines the earliest completion date for the project.
  - It is the longest path through a network diagram.
  - If any activity on the critical path slips, the whole project will slip :
- **Crashing** and **fast tracking** are two techniques for shortening project schedules.
- **Critical chain scheduling** is an application of the Theory of Constraints (TOC) that uses critical path analysis, resource constraints, and buffers to help meet project completion dates.
- The **Program Evaluation and Review Technique (PERT)** is a network analysis technique used to estimate project duration when there is a high degree of uncertainty about the activity duration estimates.

Question 1:

You cannot start editing a technical report until someone else completes the first draft. What type of dependency does this represent?

- ✓ A. finish-to-start
- B. start-to-start
- C. finish-to-finish
- D. start-to-finish

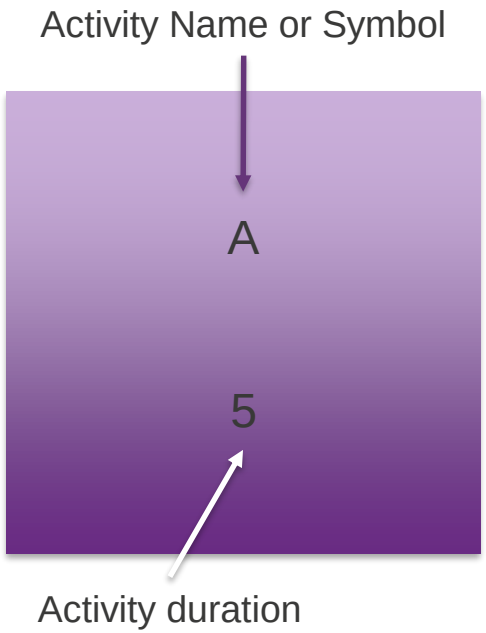
Workshop Exercise

1. Understand project scheduling.
2. Perform project network calculations – Free Float and Total Float.
3. Determine Critical Path of a project network.

- We will do an exercise on drawing a Network Diagram.

Activity	Duration (Days)	Constraints
A	5	Start at any time
B	10	Start at any time
C	7	Start after A has finished
		End after D has finished
D	4	Start after B has finished
E	3	Start after B has finished
F	4	Start after C has finished
The project has finished when E and F have finished		

A node for AON



* For simplicity, activity duration is stored within the node

AON

Activity	Duration (Days)	Constraints
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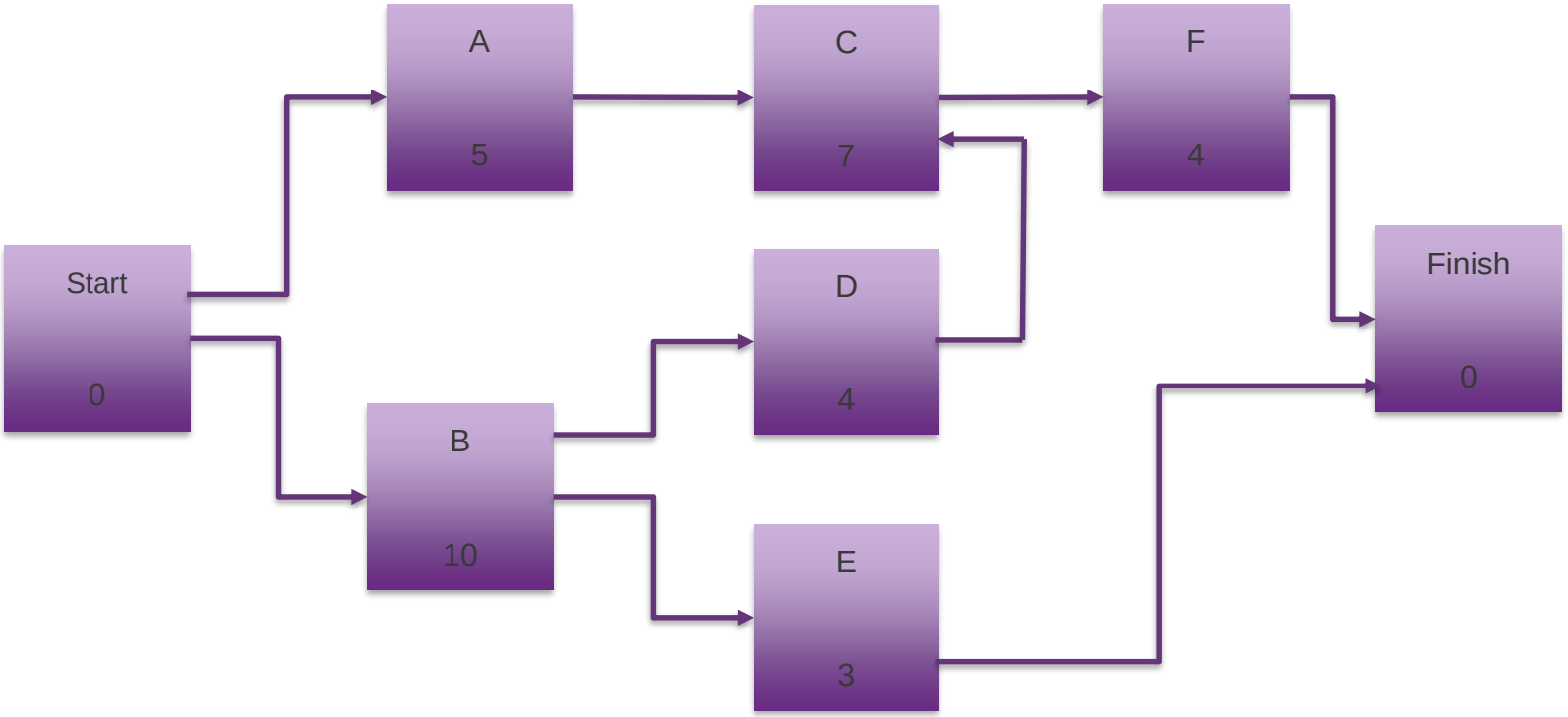
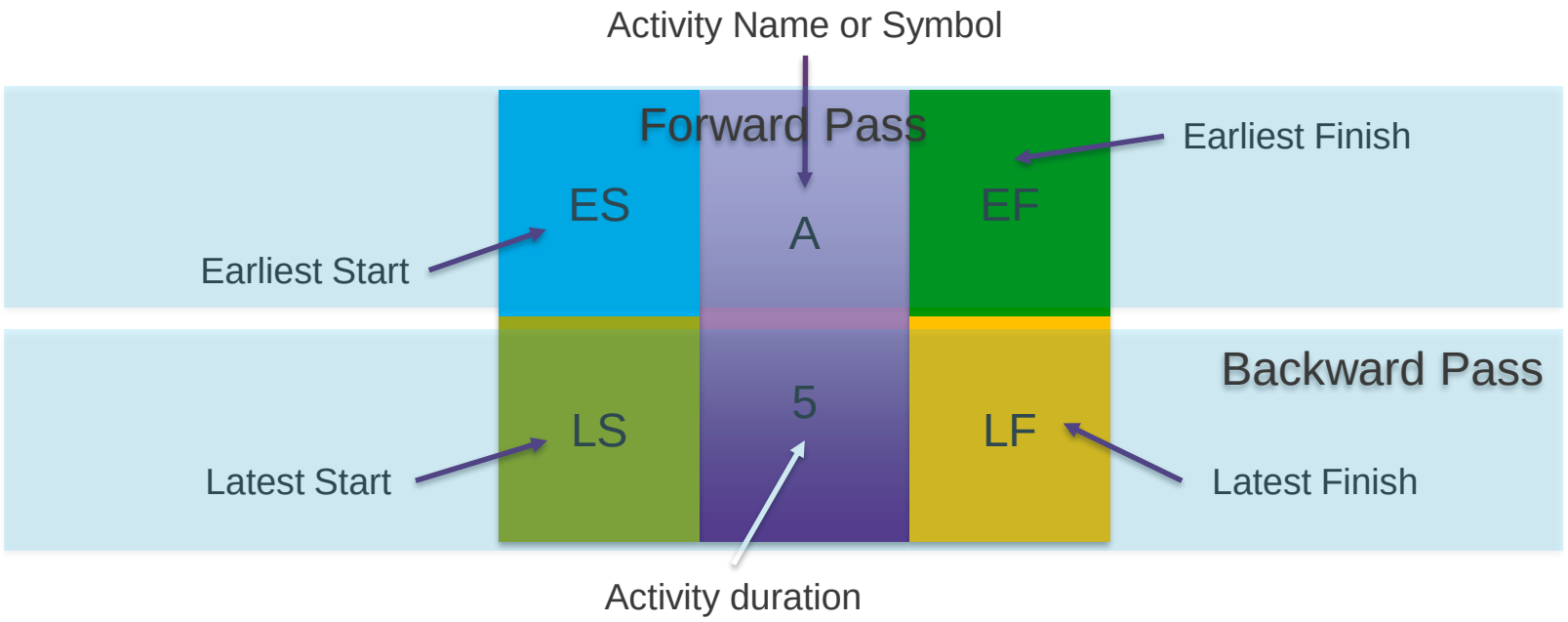


* Animated slide

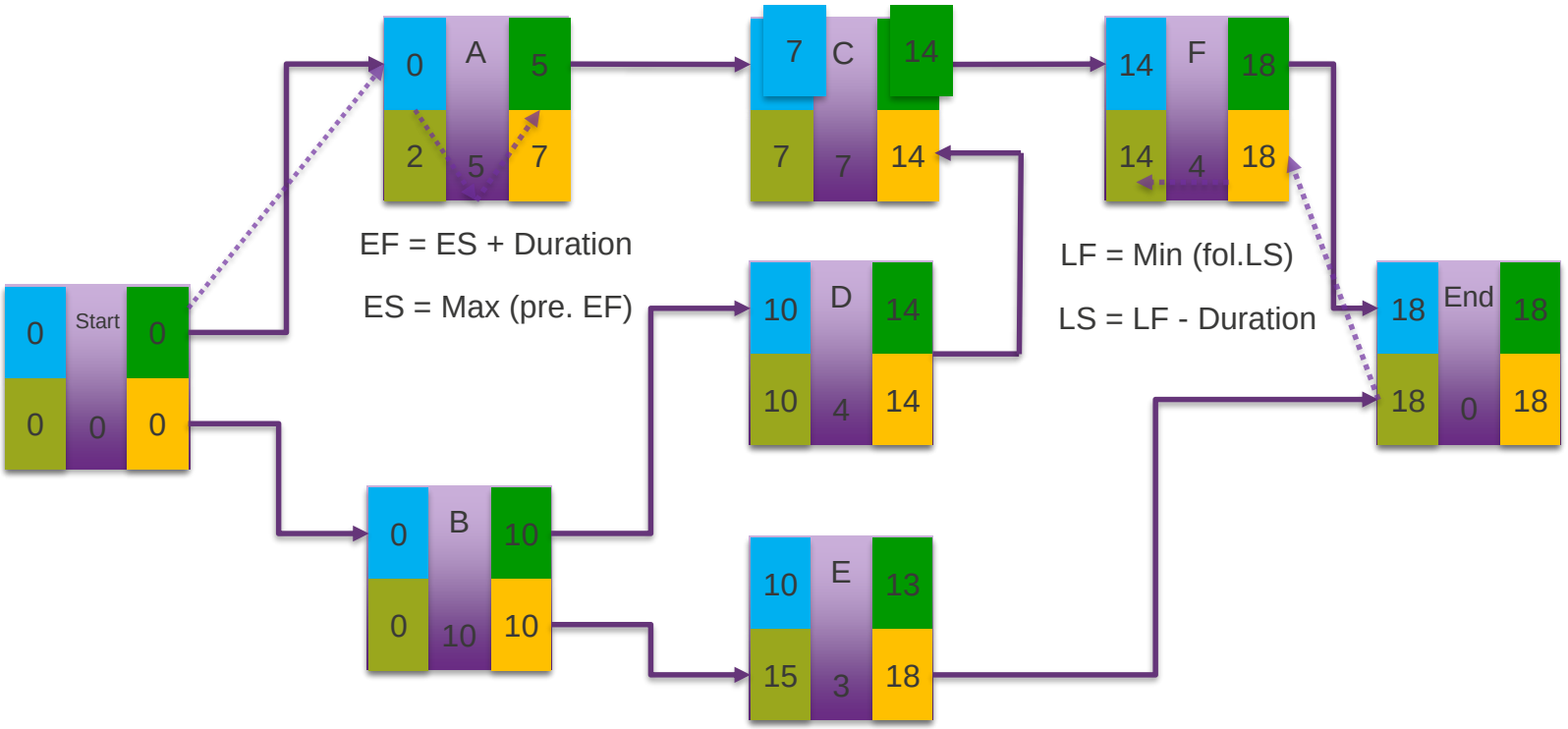
Determine the Project Schedule

1. Forward Pass
   - Earliest start (ES) = Max (EF of all immediate predecessors)
   - Earliest finish (EF) = ES + Activity Duration
2. Backward Pass
   - Latest start (LS) = LF – Activity Duration
   - Latest finish (LF) = Min (LS of all immediate following activities)

A node for AON with FP & BP



AON with FP & BP



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Calculations – Free Float & Total Float

1. Floats a.k.a Slack is the amount of time an activity may be delayed without delaying a succeeding activity or the project finish date (i.e. the length of time an activity can be delayed without delaying the entire project).
2. Total float is the amount of time an activity may be delayed from its early start without delaying the planned project finish date.

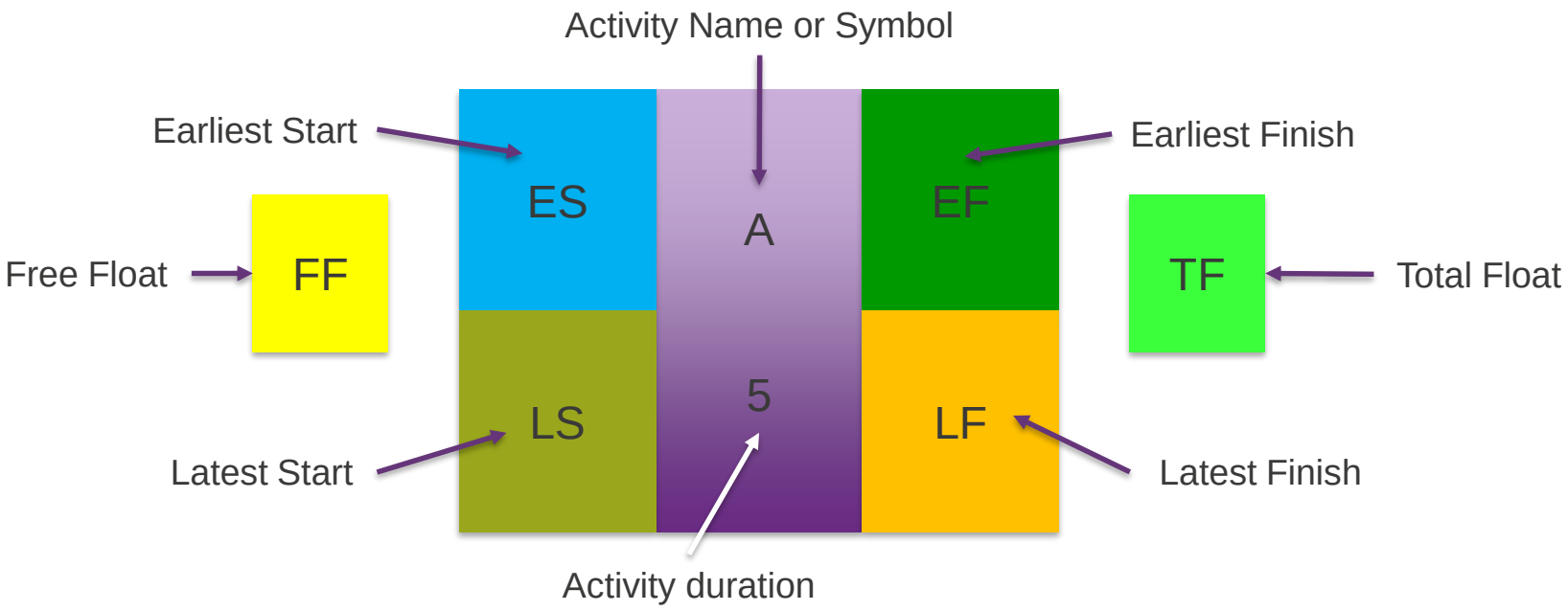
   Total Float (TF) = Latest Finish (LF) – Earliest Finish (EF)

3. Free float is the amount of time an activity can be delayed without delaying the early start of any immediately following activities.

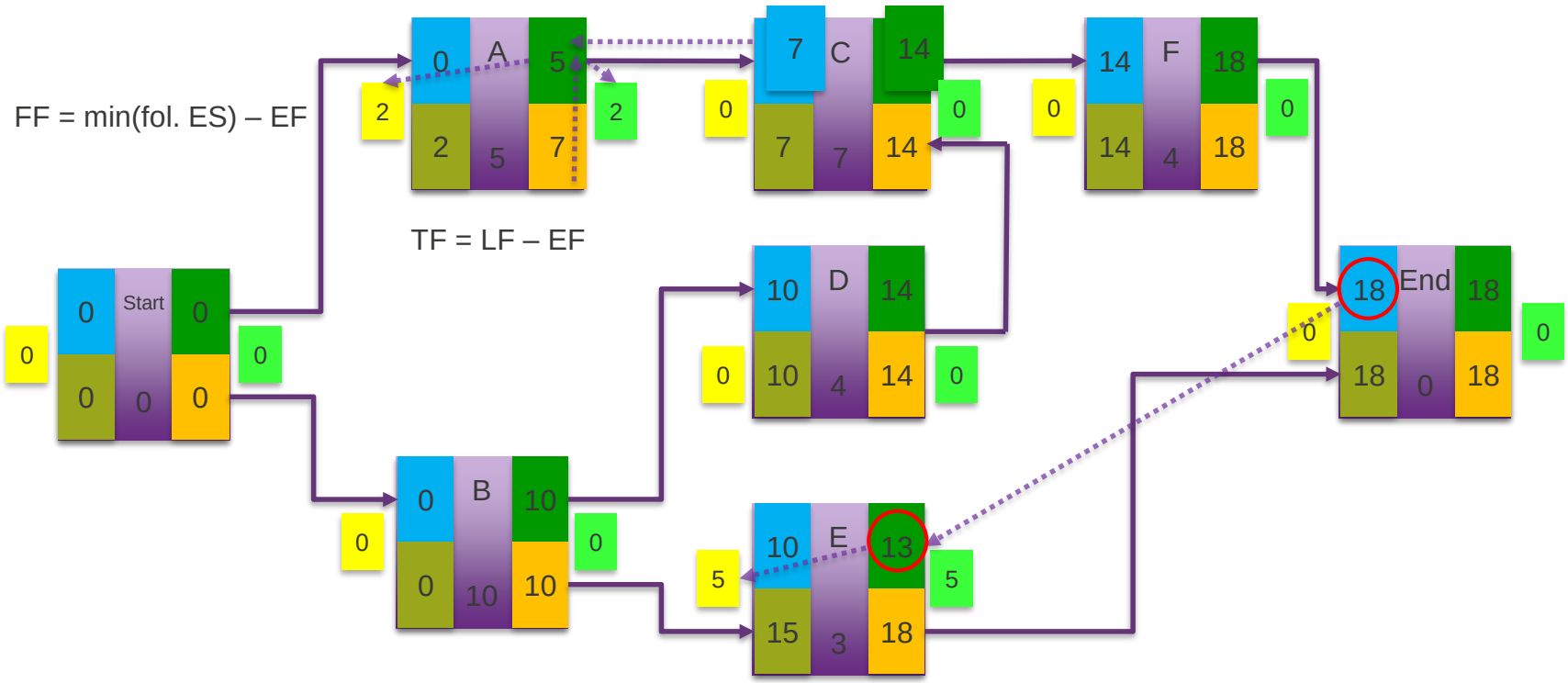
   Free Float (FF)* = Earliest of the Earliest Start (ES) of following activities – Earliest Finish (EF)

* For sequential activities. It's more complicated for start-to-start and end-to-end

A node for AON with FF & TF



AON with FF & TF



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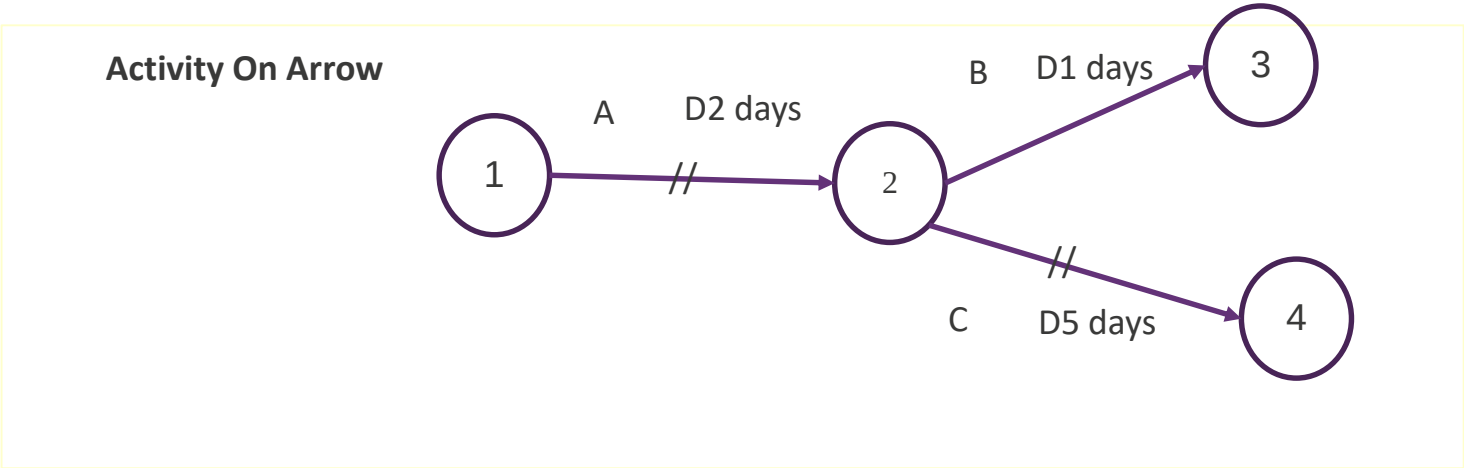
Determining the Critical Path

1. A critical activity is an activity with zero float.
2. A critical path is :
   - the shortest time possible to complete the project.
   - a path of activities, from the start node to the finish node with no float (all critical activities).
3. The sequence of activities in critical path will be the longest overall duration. Any delay of an activity on the critical path directly impacts the planned project completion date.
4. It is useful for plan activities in order to complete project in the shortest time.

Critical Paths

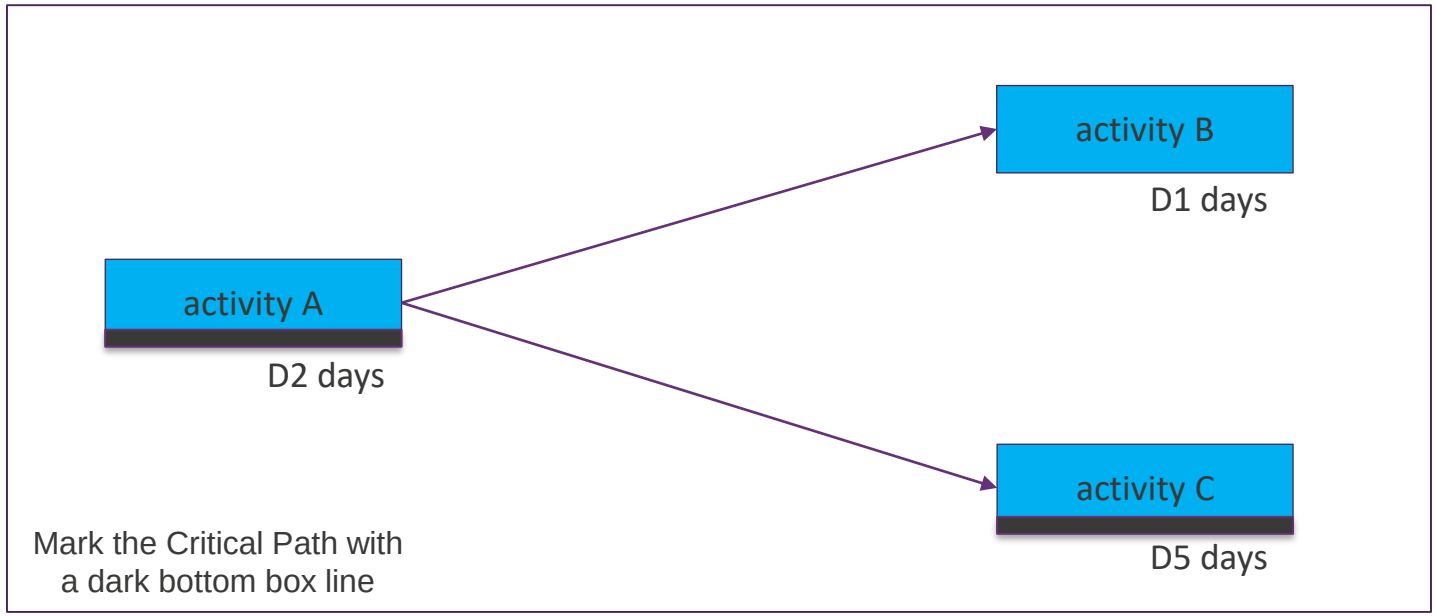
1. A project can have several, parallel, near critical paths.
2. An additional parallel path through the network with the total durations shorter than the critical path is called a sub-critical or non-critical path.
3. Critical paths are important for project compression (to be coved in next topic).
4. Mark the Critical Path with double lines for AOA .
5. For AON, mark the critical path with a dark bottom box line.

Example: Critical Path in AOA

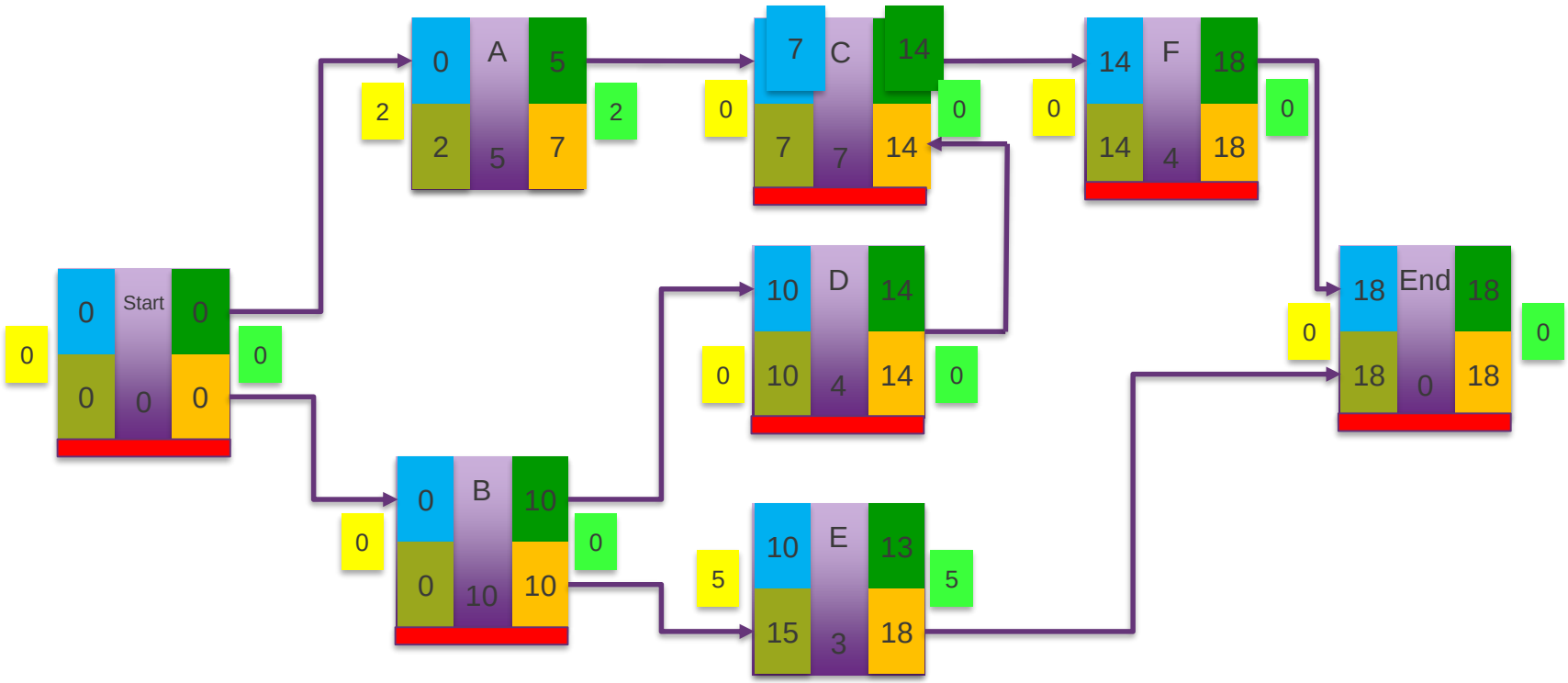


Mark the Critical Path with double lines

Example: Critical Path in AON



AON with Critical Path



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Summary

1. Project network calculations – **Free Floa**t and **Total Float** are important to determine the critical path in a project.
2. **Critical Path** of a project network is a path of activities, from the start node to the finish node with no float. It is critical, because it is the shortest time possible to complete the project.

Question 2:

Which one of the following statements is false?

A. A resource breakdown structure is a hierarchical structure that identifies the project's resources by category and type.

✓ B. Duration and effort are synonymous terms.

C. A three-point estimate includes an optimistic, most likely, and pessimistic estimate.

D. A Gantt chart is a common tool for displaying project schedule information.

Question 3:

Which one of the following statements is false?

A. Critical Path Method is a network diagramming technique used to predict total project duration..

B. The critical path is the series of activities that determine the earliest time by which a project can be completed.

C. A forward pass through a project network diagram determines the early start and early finish dates for each activity.

✓ D. Fast tracking is a technique for making cost and schedule trade-offs to obtain the greatest amount of schedule compression for the least incremental cost.

Explanation for Question 3

- Answer: D.
- Fast tracking is a technique for making cost and schedule trade-offs to obtain the greatest amount of schedule compression for the least incremental cost. → this is false
- Fast tracking means doing the activities in parallel or overlapping them
- Crashing is a technique for making cost and schedule trade-offs to obtain the greatest amount of schedule compression for the least incremental cost (to be covered in Workshop 6)