D7 UNIT 3-B
PLANNING

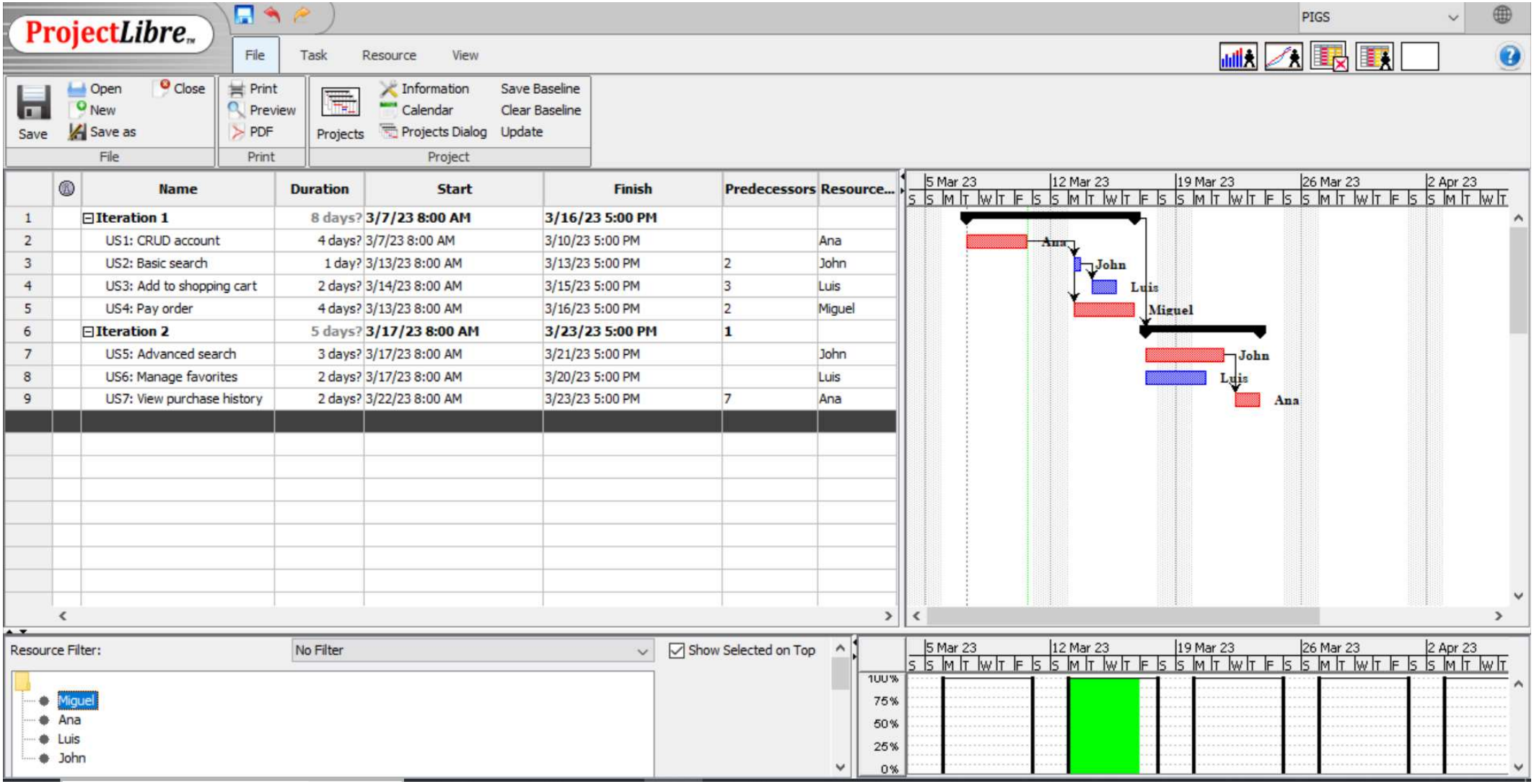
Time management and scheduling

Miguel Alemán Flores

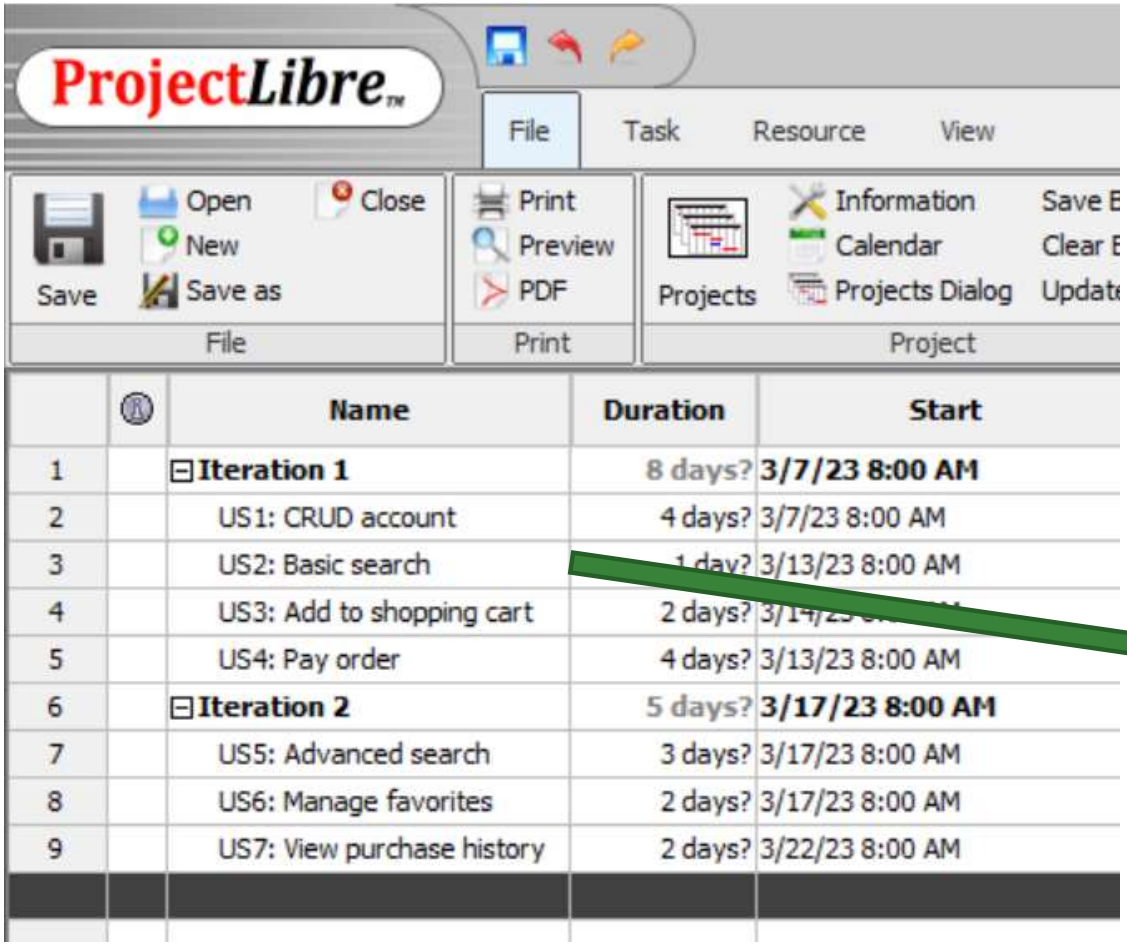
Time management and scheduling

Overview

2



Time management and scheduling
Identification of the tasks

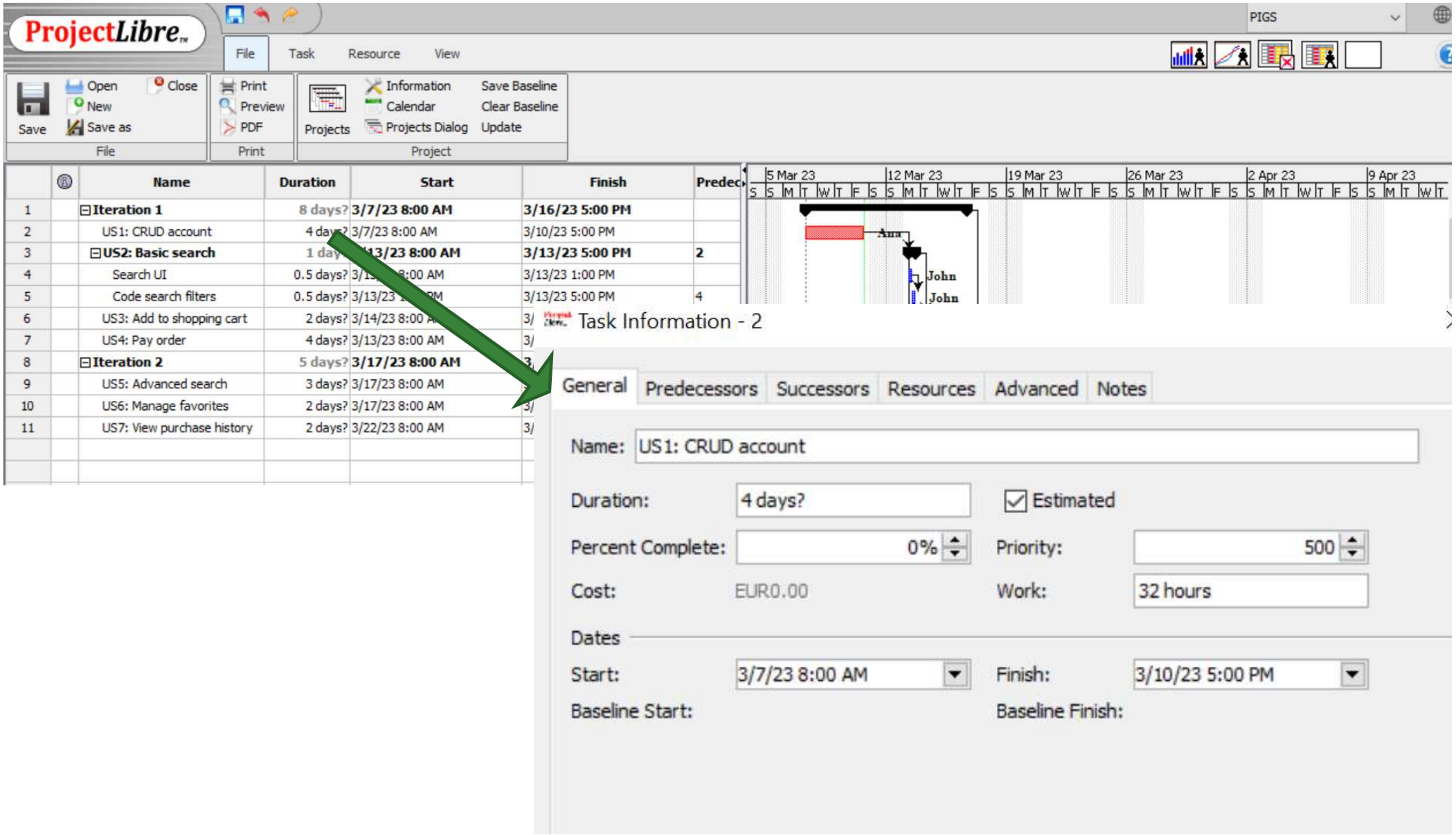


		Name	Duration	Start
1		**Iteration 1**	8 days?	**3/7/23 8:00 AM**
2		US1: CRUD account	4 days?	3/7/23 8:00 AM
3		US2: Basic search	1 day?	3/13/23 8:00 AM
4		US3: Add to shopping cart	2 days?	3/14/23
5		US4: Pay order	4 days?	3/13/23 8:00 AM
6		**Iteration 2**	5 days?	**3/17/23 8:00 AM**
7		US5: Advanced search	3 days?	3/17/23 8:00 AM
8		US6: Manage favorites	2 days?	3/17/23 8:00 AM
9		US7: View purchase history	2 days?	3/22/23 8:00 AM

		Name
1		**Iteration 1**
2		US1: CRUD account
3		**US2: Basic search**
4		Search UI
5		Code search filters
6		US3: Add to shopping cart
7		US4: Pay order
8		**Iteration 2**
9		US5: Advanced search
10		US6: Manage favorites
11		US7: View purchase history

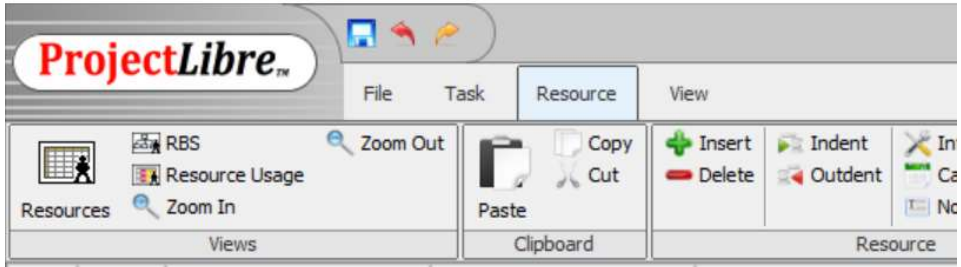
Time management and scheduling

Planning of the execution sequence



Time management and scheduling
Allocation of resources

PIGS - C:\Users\malem\Desktop\PIGS.pod *

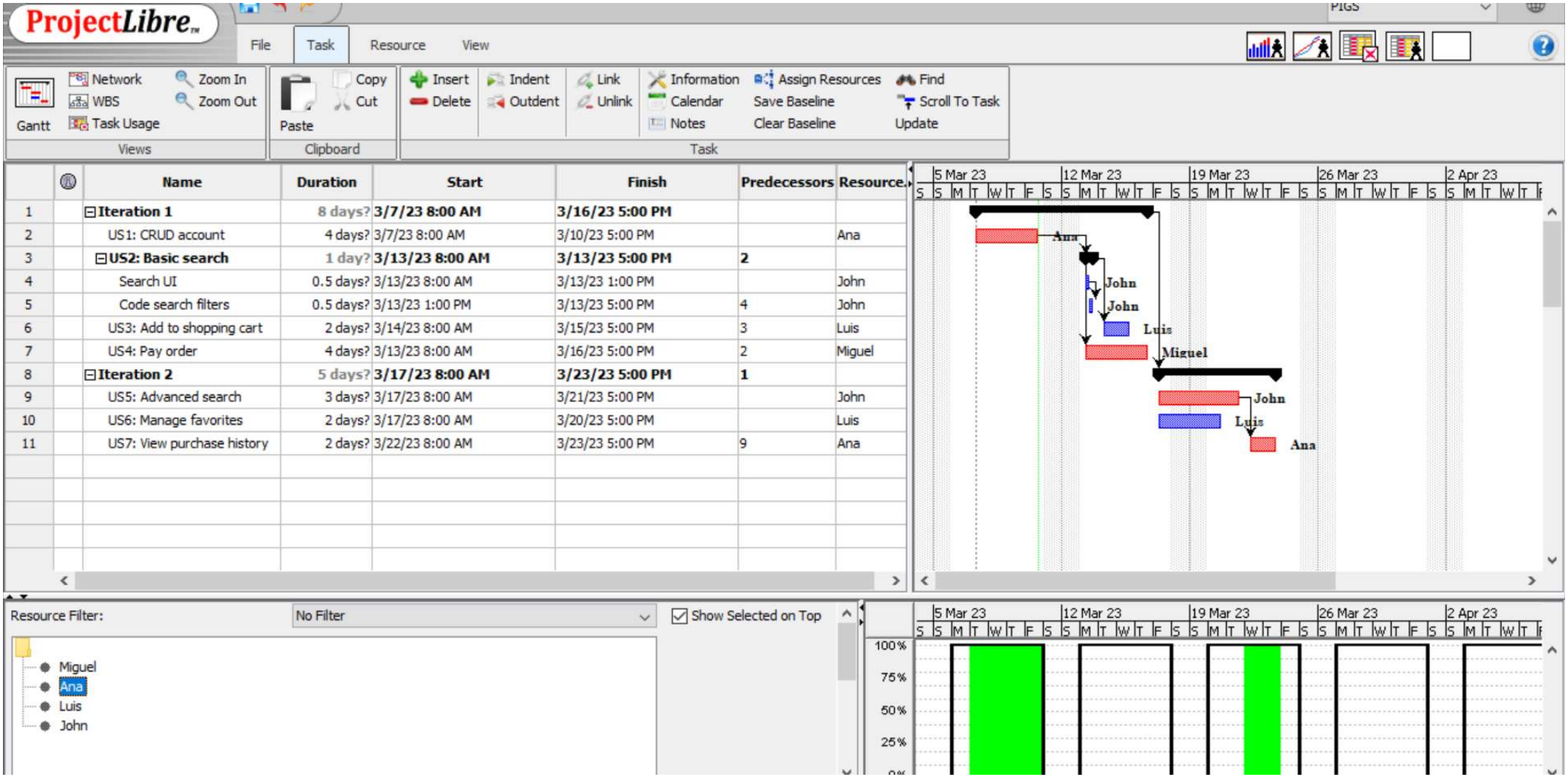


		Name	RBS	Type
1		Miguel		Work
2		Ana		Work
3		Luis		Work
4		John		Work

		Name	Duration	Start	Finish	Predecessors	Resource...
1		**Iteration 1**	**8 days?**	**3/7/23 8:00 AM**	**3/16/23 5:00 PM**		
2		US1: CRUD account	4 days?	3/7/23 8:00 AM	3/10/23 5:00 PM		Ana
3		**US2: Basic search**	**1 day?**	**3/13/23 8:00 AM**	**3/13/23 5:00 PM**	**2**	
4		Search UI	0.5 days?	3/13/23 8:00 AM	3/13/23 1:00 PM		John
5		Code search filters	0.5 days?	3/13/23 1:00 PM	3/13/23 5:00 PM	4	John
6		US3: Add to shopping cart	2 days?	3/14/23 8:00 AM	3/15/23 5:00 PM	3	Luis
7		US4: Pay order	4 days?	3/13/23 8:00 AM	3/16/23 5:00 PM	2	Miguel
8		**Iteration 2**	**5 days?**	**3/17/23 8:00 AM**	**3/23/23 5:00 PM**	**1**	
9		US5: Advanced search	3 days?	3/17/23 8:00 AM	3/21/23 5:00 PM		John
10		US6: Manage favorites	2 days?	3/17/23 8:00 AM	3/20/23 5:00 PM		Luis
11		US7: View purchase history	2 days?	3/22/23 8:00 AM	3/23/23 5:00 PM	9	Ana

Time management and scheduling

Distribution of the estimated effort



Time management and scheduling

Overview

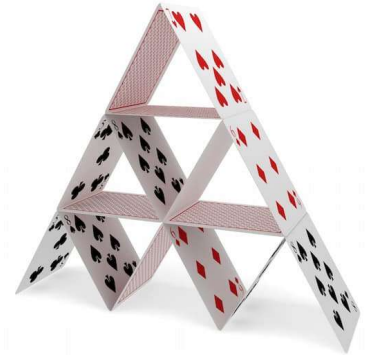
Scheduling *is the art of* ***planning*** *your* ***activities*** *so that you can achieve your* ***goals*** *and* ***priorities*** *in the* ***time*** *you have available.*

Project Management Institute

Software project ***scheduling*** *is an activity that distributes estimated* ***effort*** *across the planned project* ***duration*** *by* ***allocating*** *the effort to specific software engineering* ***tasks****.*

Allen B. Tucker

Principles of software project scheduling

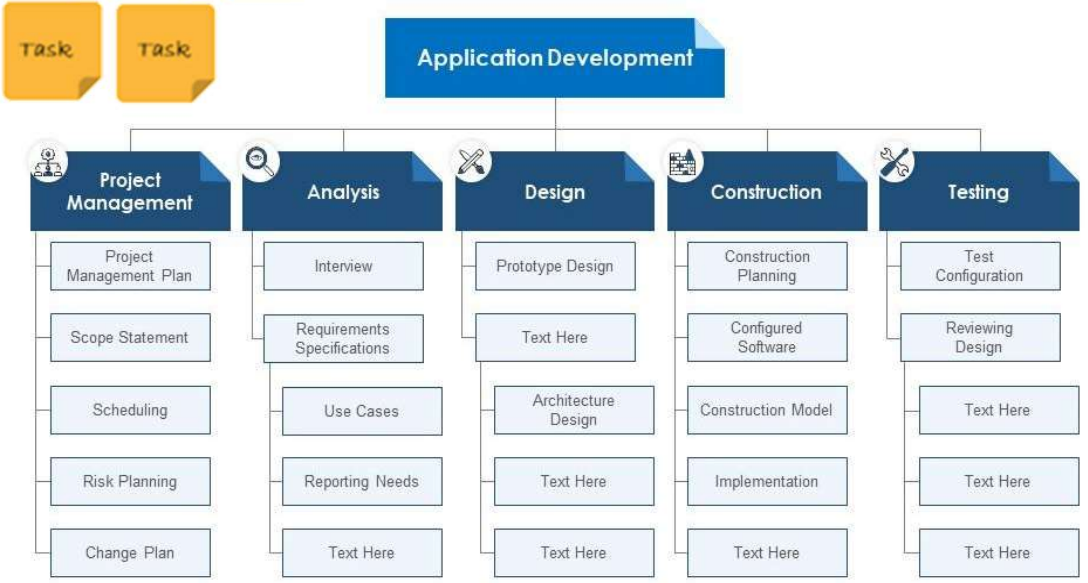


Credit: Getty images/iStockphoto

Principles of software project scheduling

Compartmentalization

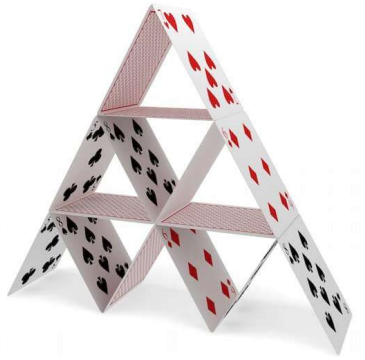
- The project must be compartmentalized into manageable activities and tasks.
- Both the product and the process are decomposed.



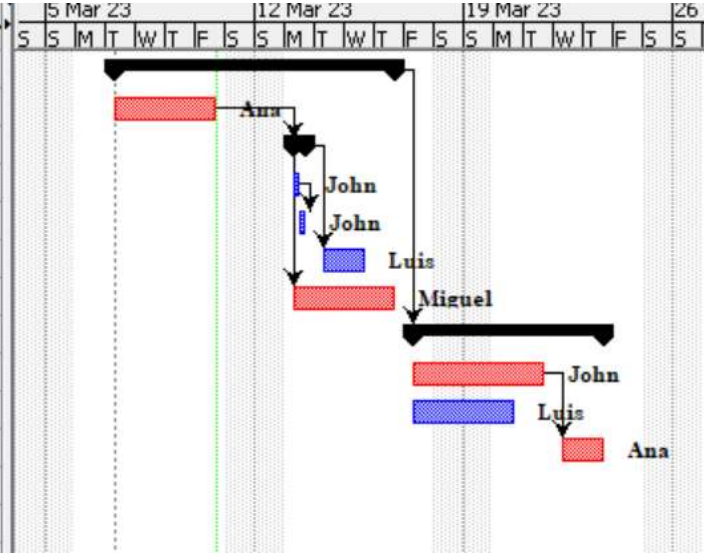
Principles of software project scheduling

Interdependency

- Certain tasks must be performed in a sequential order since the output of one task will be the input of the next task.
- Other tasks can occur independently.



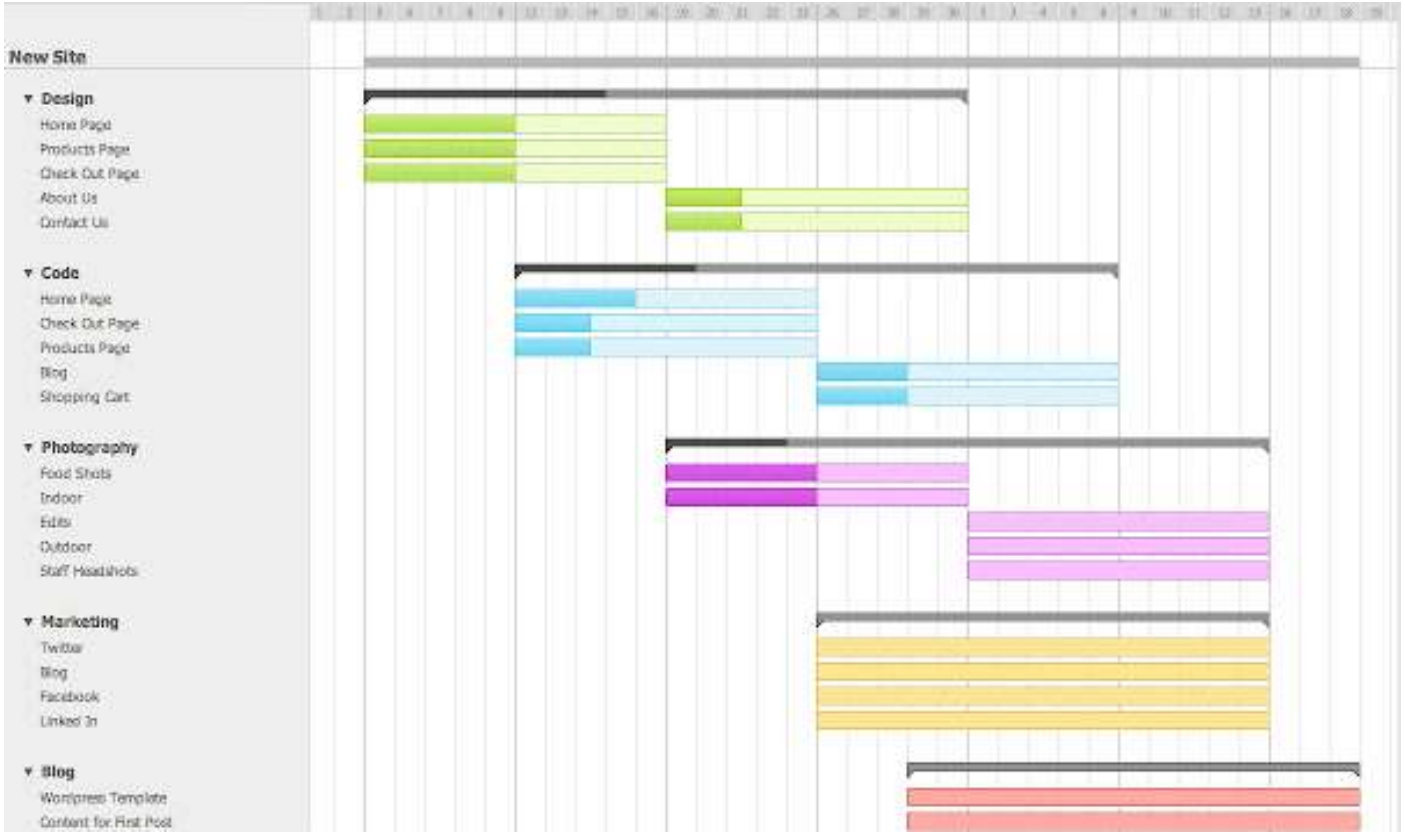
Name	Duration	Start	Finish	Predecessors	Resource
Iteration 1	8 days?	**3/7/23 8:00 AM**	**3/16/23 5:00 PM**		
US1: CRUD account	4 days?	3/7/23 8:00 AM	3/10/23 5:00 PM		Ana
US2: Basic search	1 day?	**3/13/23 8:00 AM**	**3/13/23 5:00 PM**	**2**	
Search UI	0.5 days?	3/13/23 8:00 AM	3/13/23 1:00 PM		John
Code search filters	0.5 days?	3/13/23 1:00 PM	3/13/23 5:00 PM	4	John
US3: Add to shopping cart	2 days?	3/14/23 8:00 AM	3/15/23 5:00 PM	3	Luis
US4: Pay order	4 days?	3/13/23 8:00 AM	3/16/23 5:00 PM	2	Miguel
Iteration 2	5 days?	**3/17/23 8:00 AM**	**3/23/23 5:00 PM**	**1**	
US5: Advanced search	3 days?	3/17/23 8:00 AM	3/21/23 5:00 PM		John
US6: Manage favorites	2 days?	3/17/23 8:00 AM	3/20/23 5:00 PM		Luis
US7: View purchase history	2 days?	3/22/23 8:00 AM	3/23/23 5:00 PM	9	Ana



Principles of software project scheduling

Time allocation

- Each task must be allocated some number of work units (e.g., person-days of effort).
- Each task must be assigned a start date and a completion date.



Principles of software project scheduling

Defined responsibilities

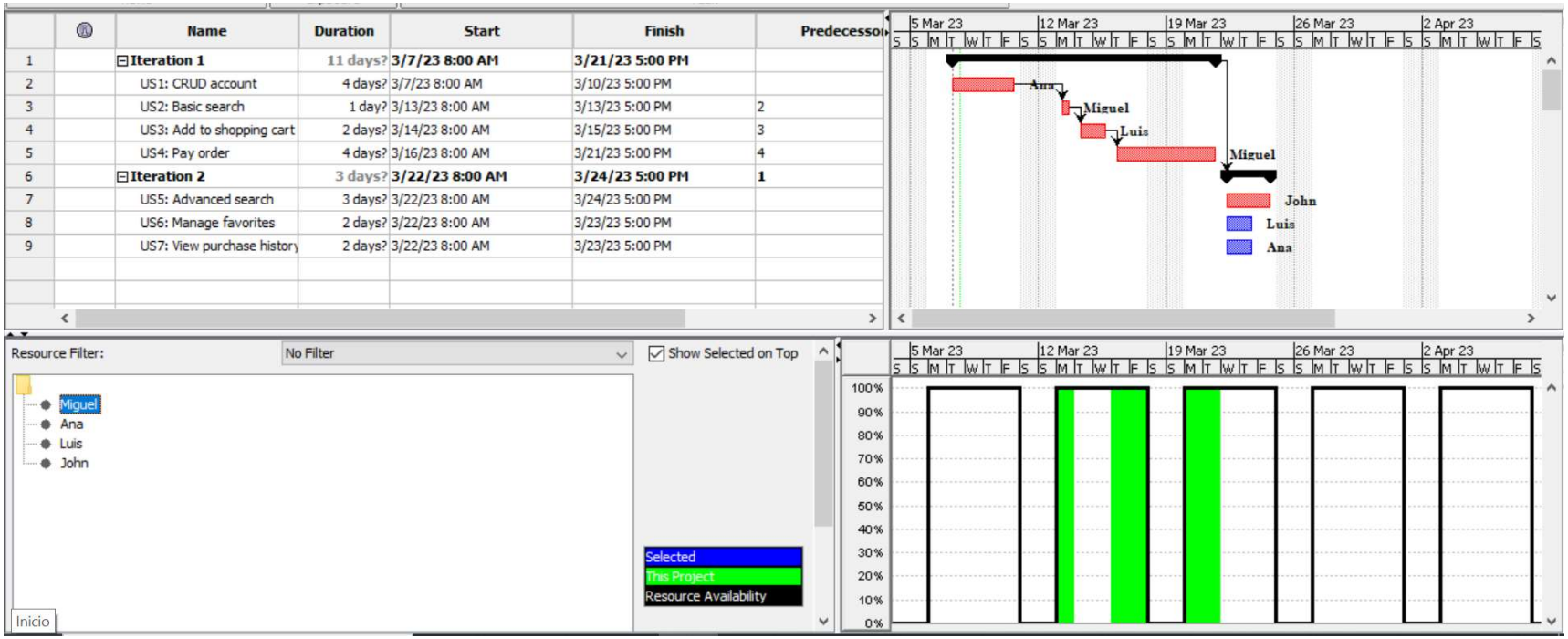
Every task which is scheduled should be assigned to a specific team member.

Name	Duration	Start	Finish	Predecessors	Resource Names
Iteration 1	11 days?	**3/7/23 8:00 AM**	**3/21/23 5:00 PM**		
US1: CRUD account	4 days?	3/7/23 8:00 AM	3/10/23 5:00 PM		Ana
US2: Basic search	1 day?	3/13/23 8:00 AM	3/13/23 5:00 PM	2	Miguel
US3: Add to shopping cart	2 days?	3/14/23 8:00 AM	3/15/23 5:00 PM	3	Luis
US4: Pay order	4 days?	3/16/23 8:00 AM	3/21/23 5:00 PM	4	Miguel
Iteration 2	3 days?	**3/22/23 8:00 AM**	**3/24/23 5:00 PM**	**1**	
US5: Advanced search	3 days?	3/22/23 8:00 AM	3/24/23 5:00 PM		John
US6: Manage favorites	2 days?	3/22/23 8:00 AM	3/23/23 5:00 PM		Luis
US7: View purchase history	2 days?	3/22/23 8:00 AM	3/23/23 5:00 PM		Ana

Principles of software project scheduling

Effort validation

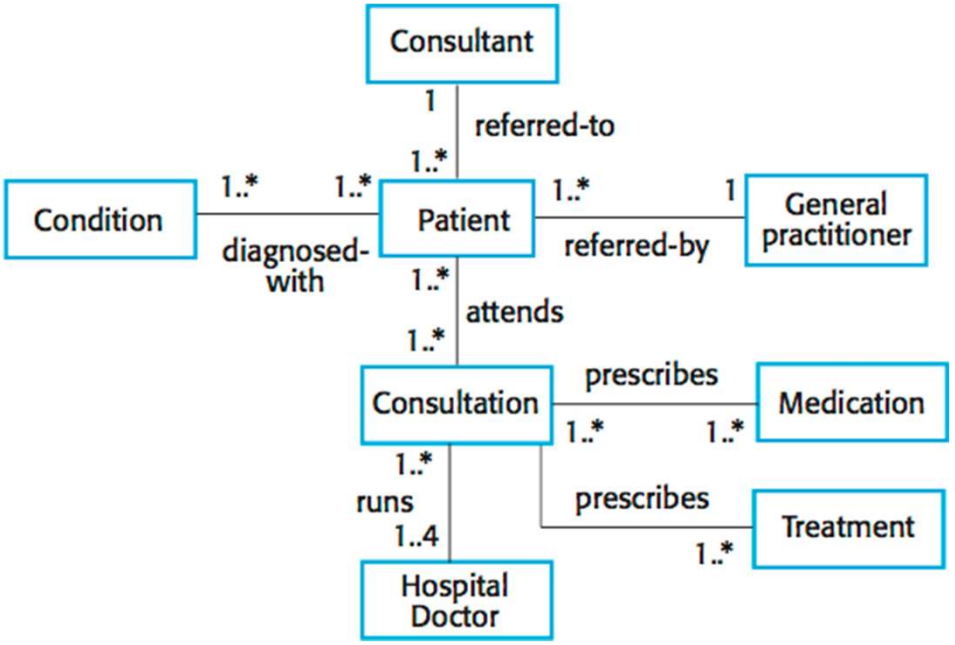
The project manager must ensure that the effort allocated does not exceed the capacity of the staff members available.



Principles of software project scheduling

Defined outcomes

- Every task which is scheduled should have a defined outcome.
- The outcome is normally a work product or a part of a work product.
- Work products are often combined in deliverables.



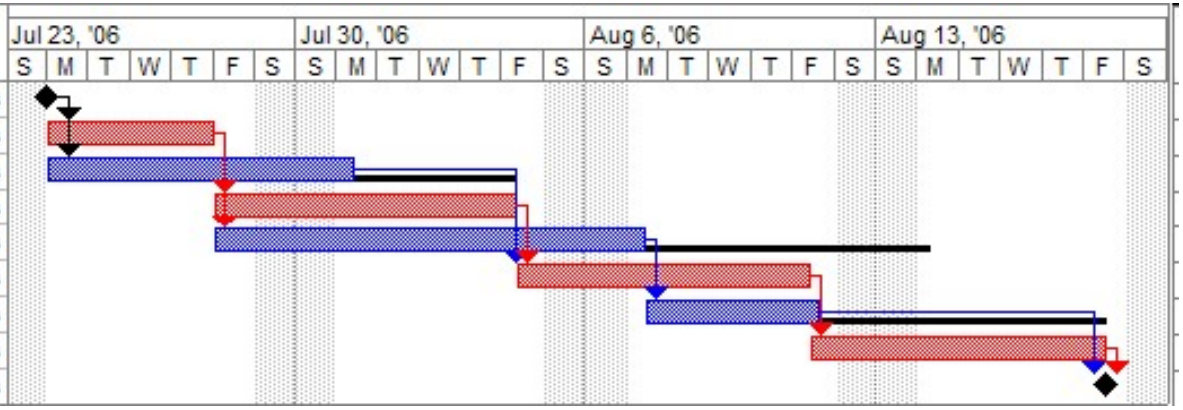
Principles of software project scheduling

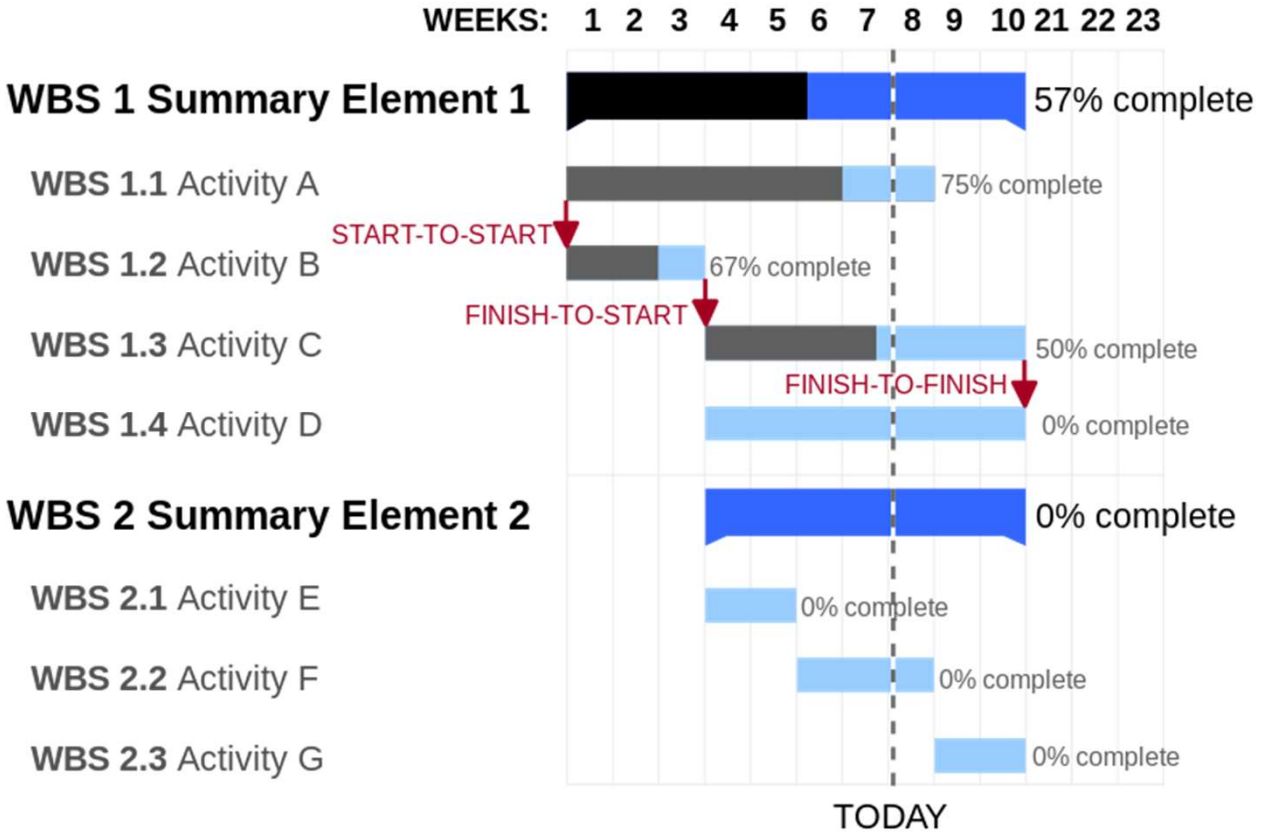
Defined milestones

- Every task or group of tasks is associated with a milestone.
- A milestone is accomplished when one or more work products have been reviewed and approved.

Gantt diagrams

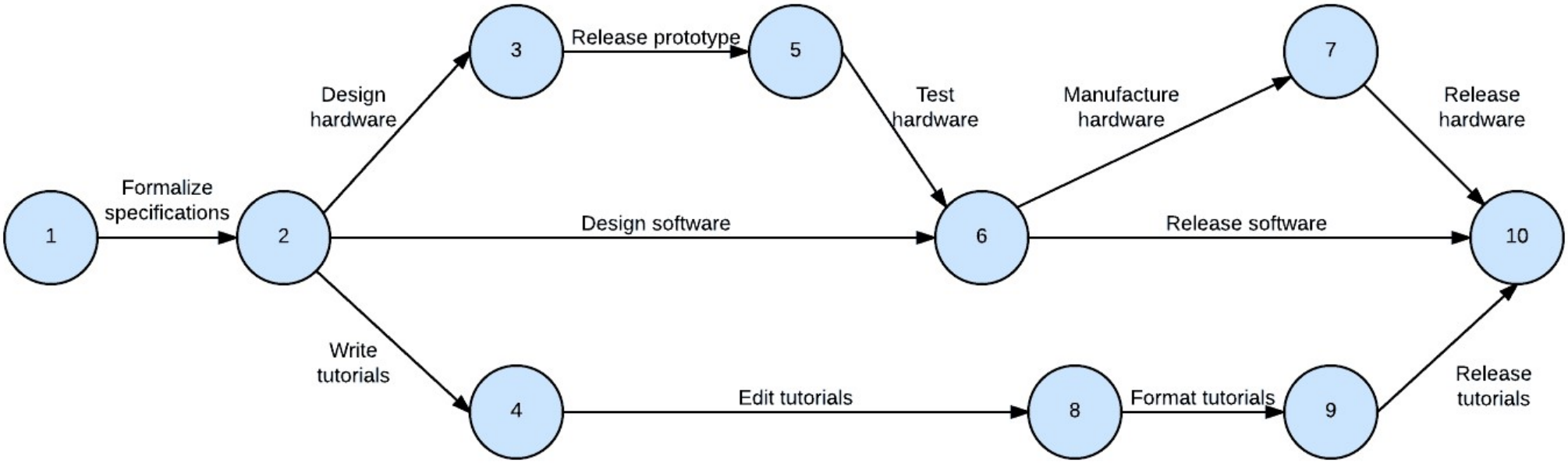
ID	Task Name	Predecessors	Duration
1	Start		0 days
2	a	1	4 days
3	b	1	5.33 days
4	c	2	5.17 days
5	d	2	6.33 days
6	e	3,4	5.17 days
7	f	5	4.5 days
8	g	6	5.17 days
9	Finish	7,8	0 days





PERT (*Program/Project Evaluation and Review Technique*)

Elements

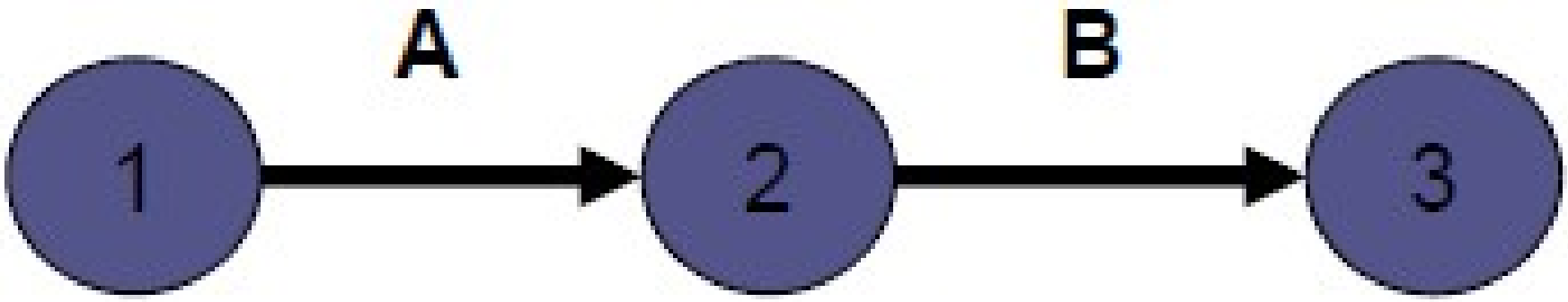


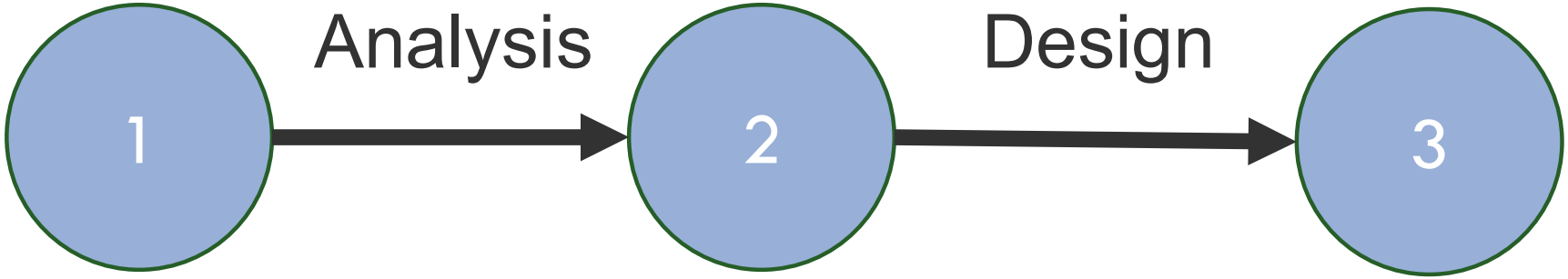
PERT (*Program/Project Evaluation and Review Technique*)

Elements

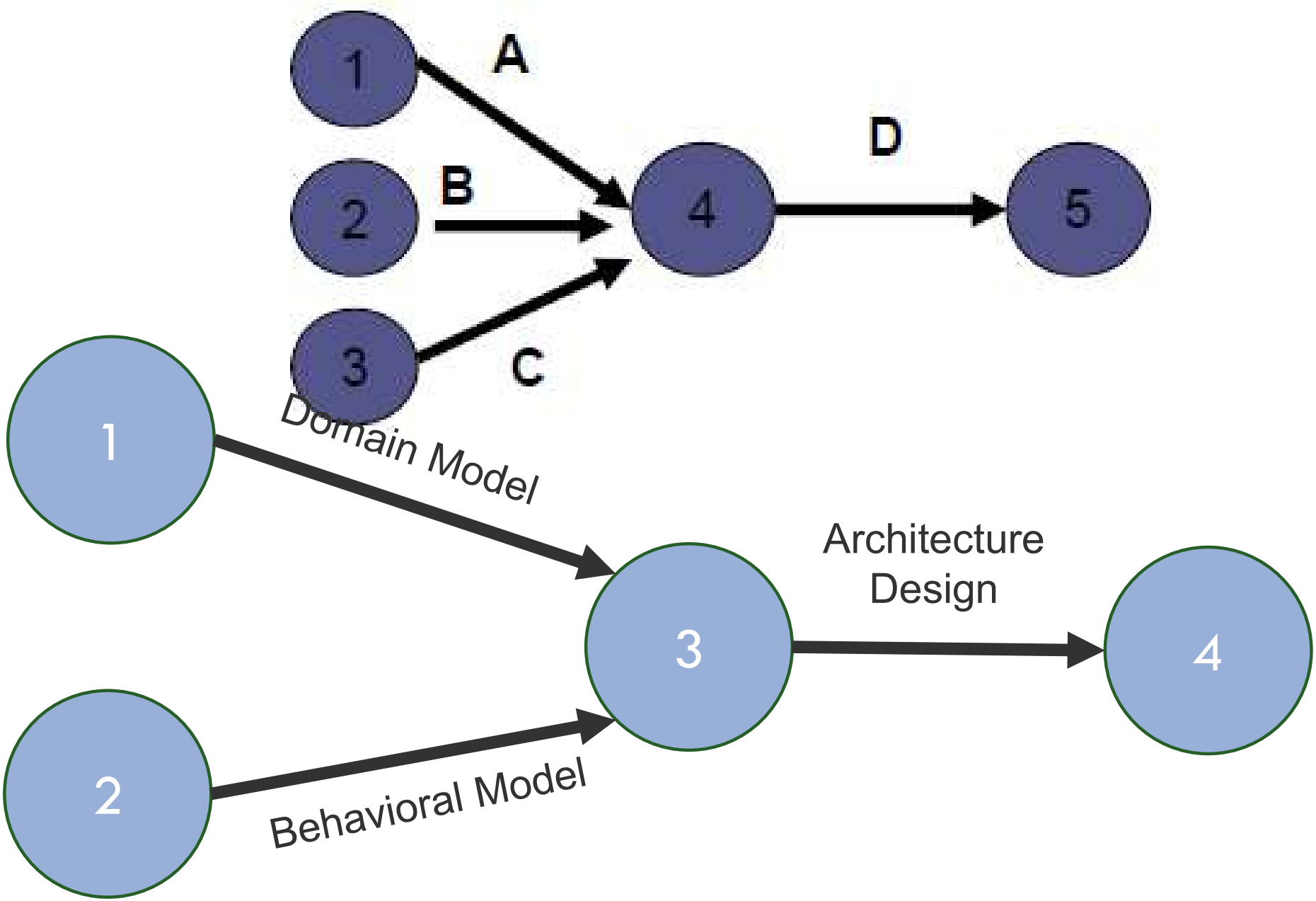
- **Activity:** task to be performed (**edges or arrows of the graph**)
- **Event**: start or finish of an activity or a group of activities (**nodes or vertices**)
- **Predecessor:** An activity that precedes another and must finish before its successor can start.

PERT Charts
Representation

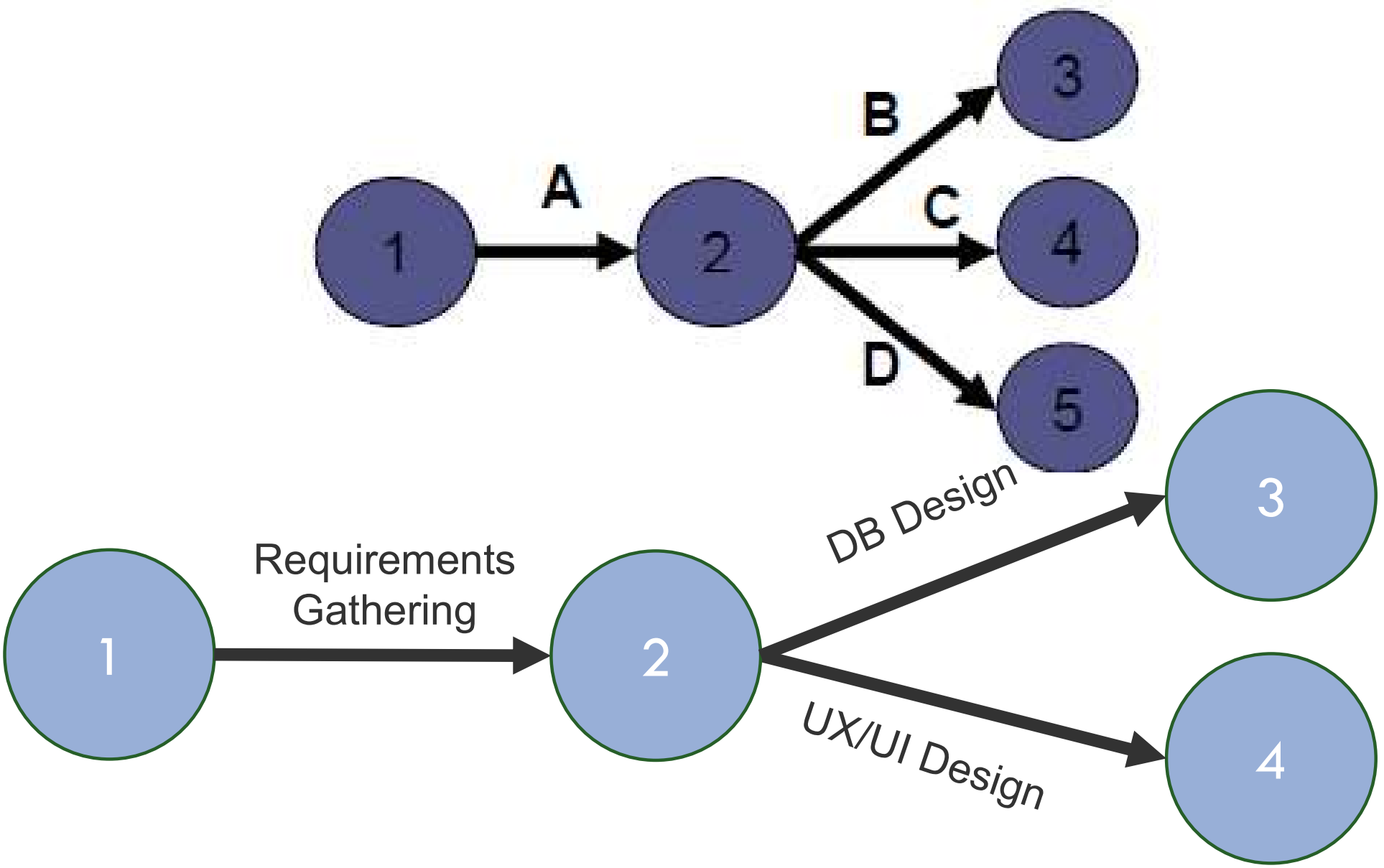




PERT Charts
Representation

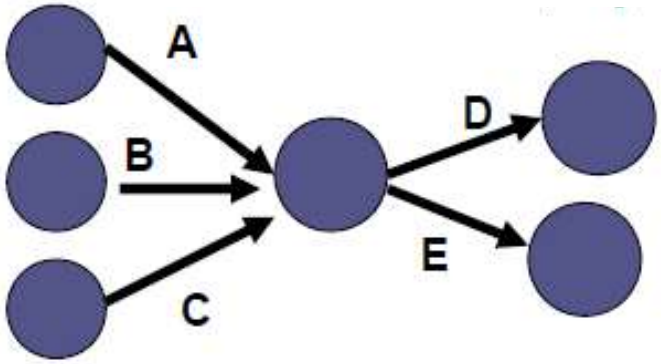


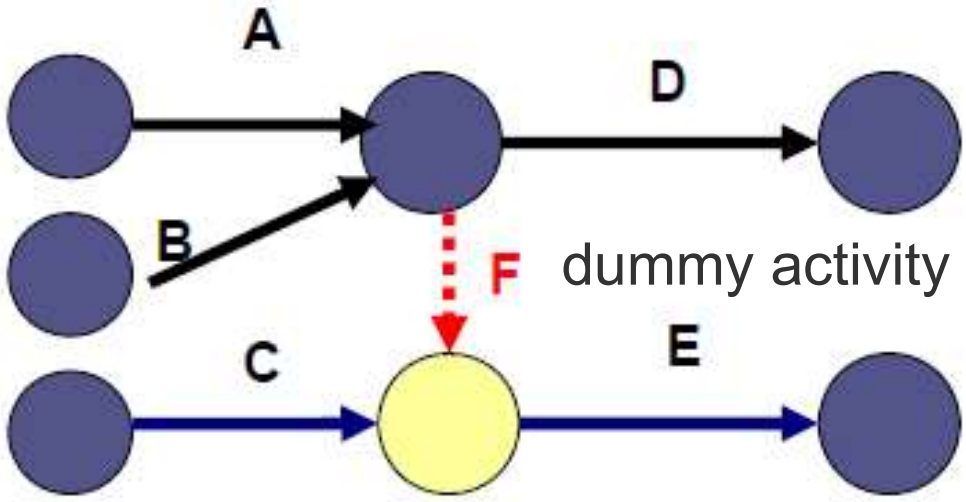
PERT Charts
Representation



PERT Charts
Representation

Activities A and B precede activity D.
Activities A, B and C precede activity E.





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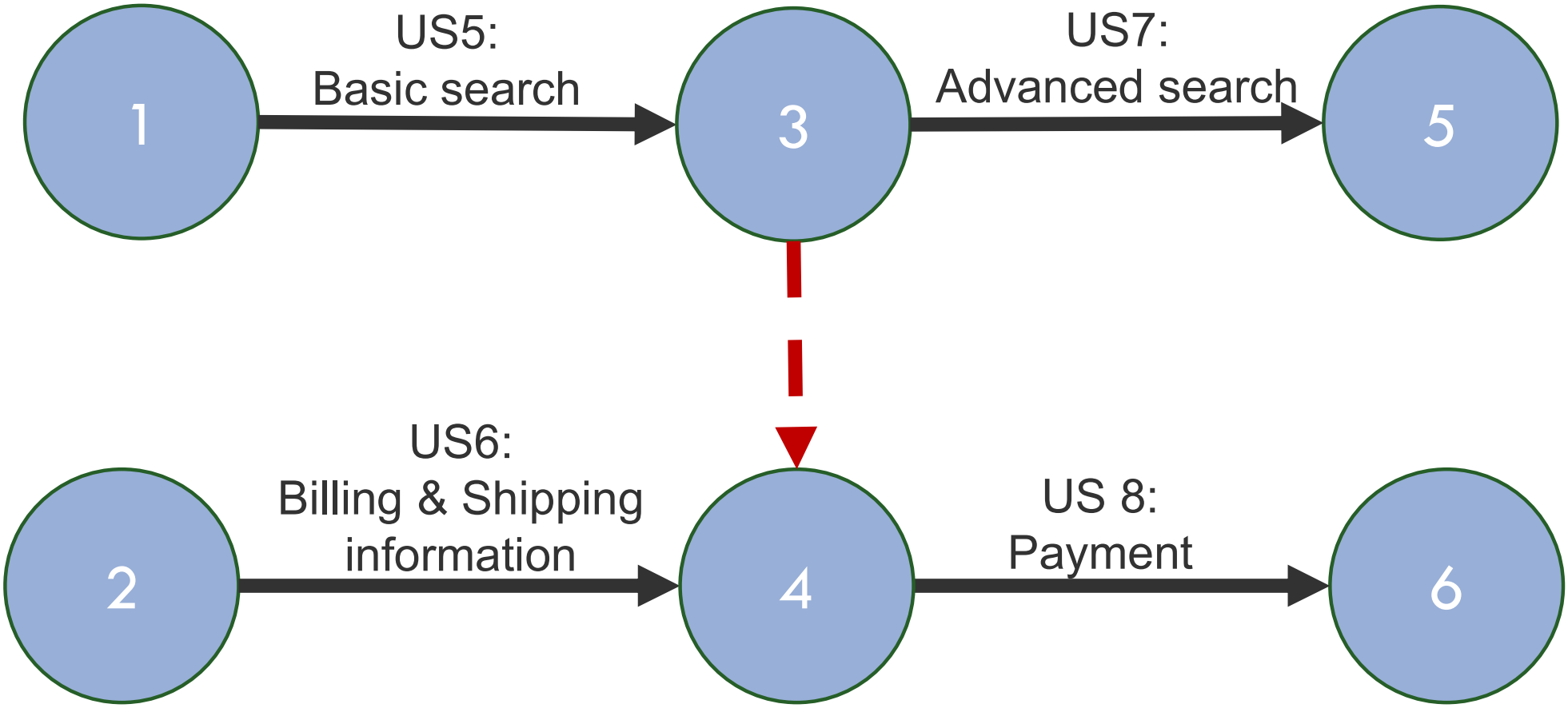
Representation



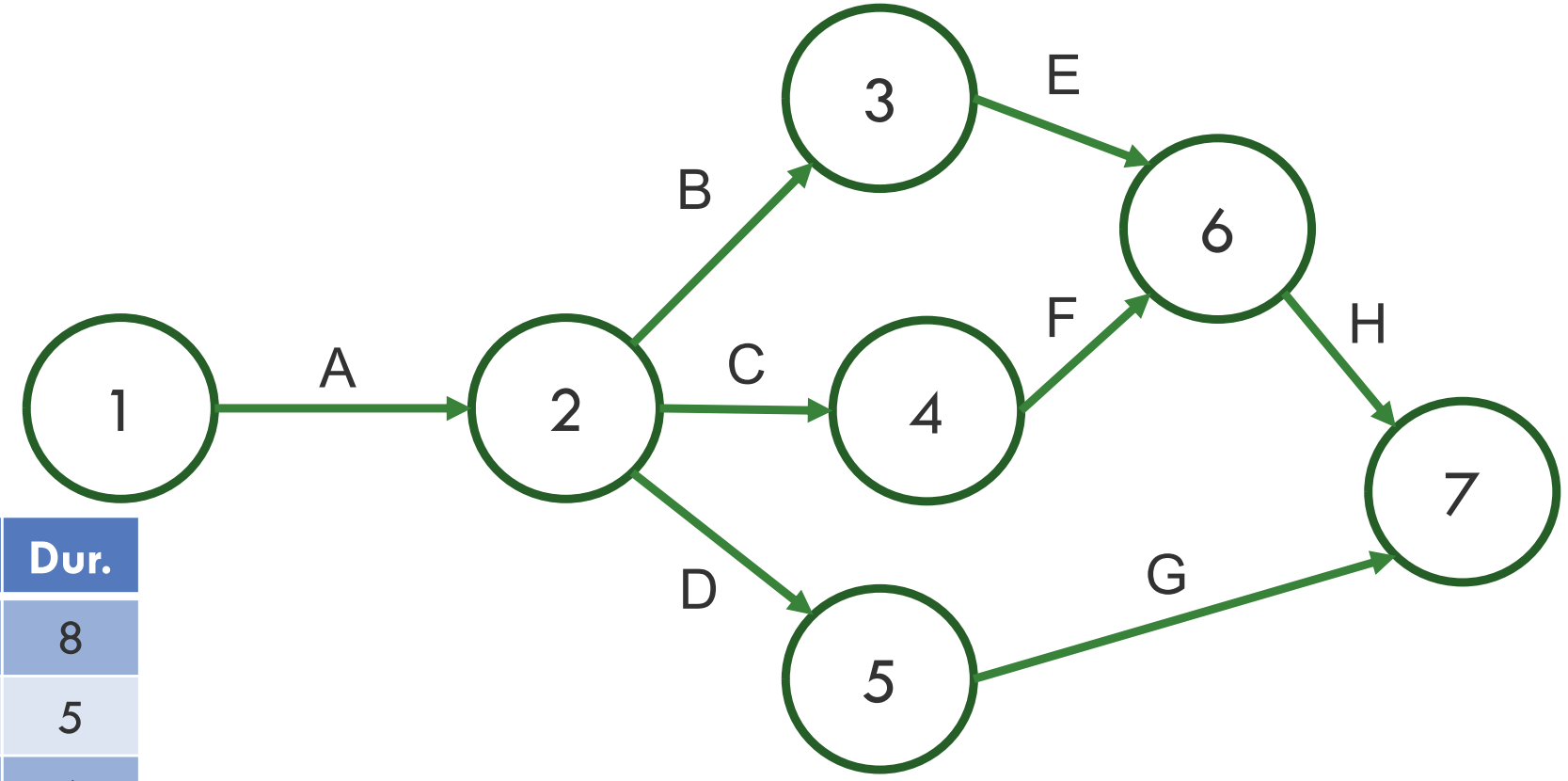
PERT Charts

Table-graph transformation

Activities	Predecessors	Duration (days)
A		8
B	A	5
C	A	6
D	A	5
E	B	6
F	C	7
G	D	9
H	E F	3

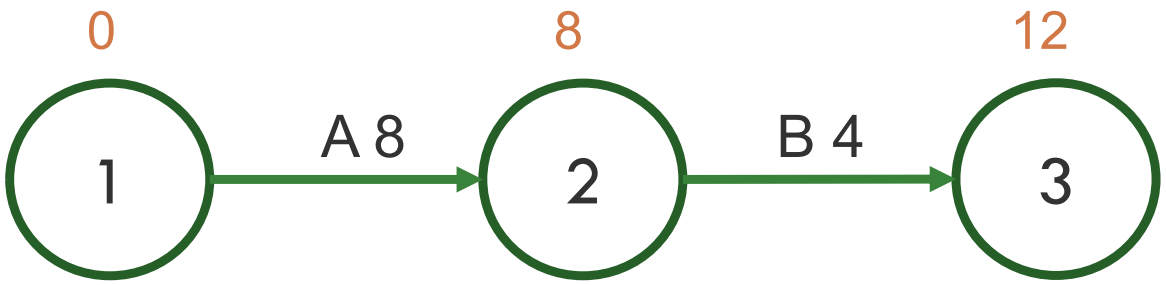
PERT Charts

Table-graph transformation



Activ.	Pred.	Dur.
A		8
B	A	5
C	A	6
D	A	5
E	B	6
F	C	7
G	D	9
H	E F	3

PERT Charts
Earliest and latest times

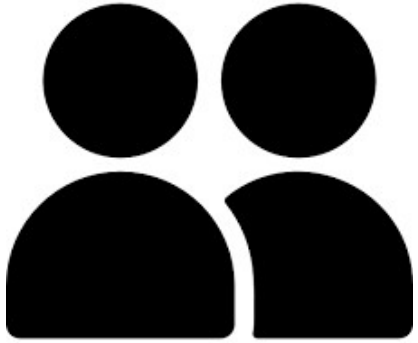


Assuming our estimates are right…

- How soon can we reach events 2 and 3?
- What happens if activity A takes longer than expected?

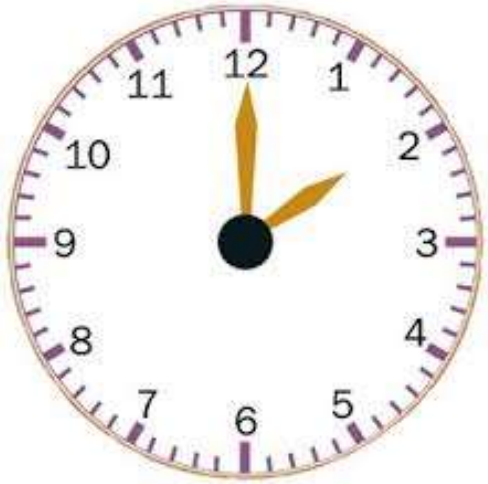
PERT Charts

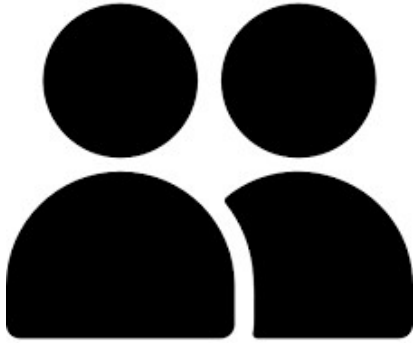
Earliest and latest times



PERT Charts

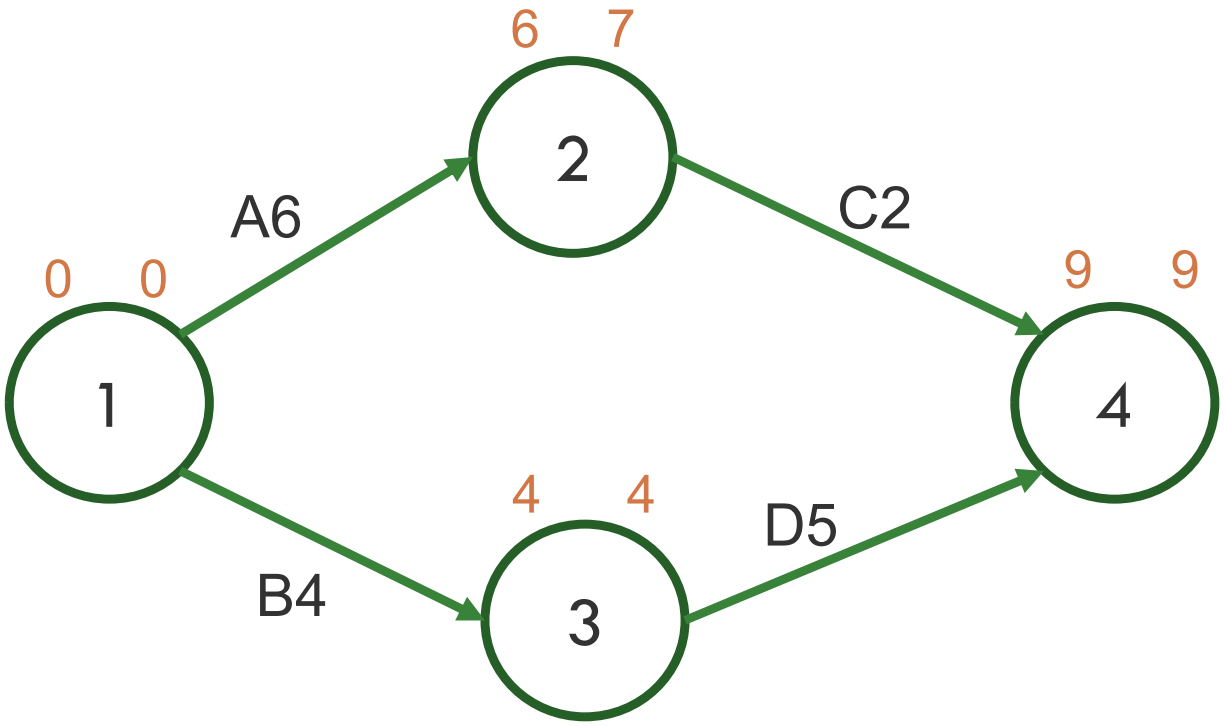
Earliest and latest times





PERT Charts

Earliest and latest times



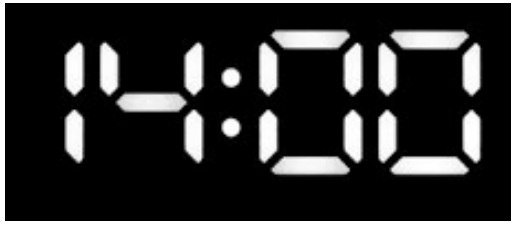
How soon can we reach events 2, 3 and 4?

If we want to finish the project on the expected date, what is the latest possible date for events 2 and 3?

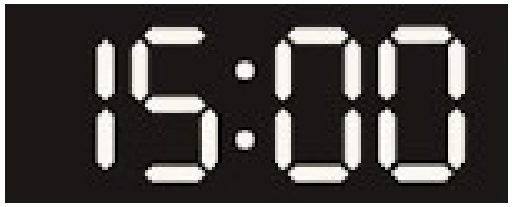
What happens if activity A is delayed and takes 7 days?

PERT Charts
Slack/Float of an activity

Activity: driving from the university to the hospital

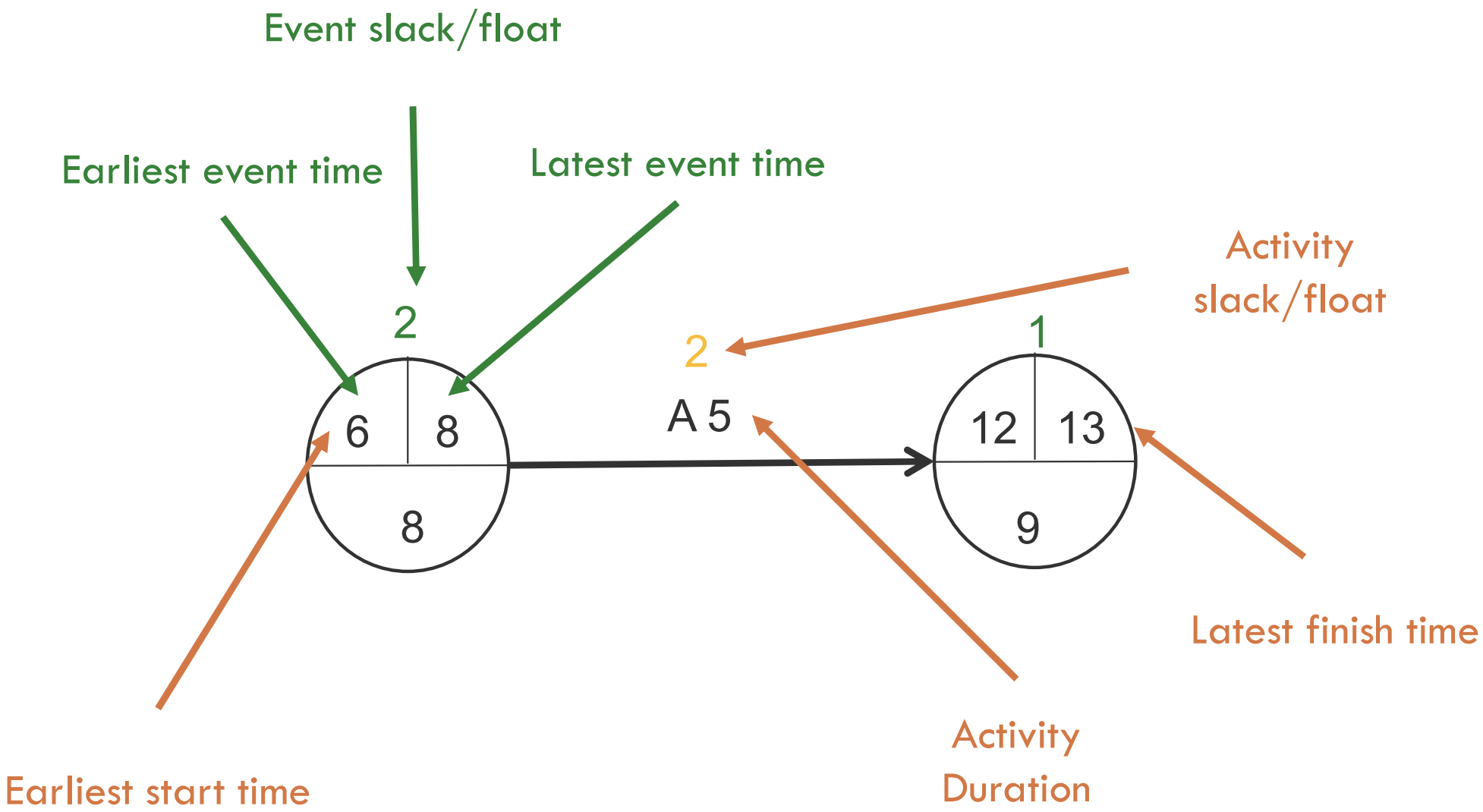


Start event
Earliest time



Finish event
Latest time

PERT Charts
Earliest and latest times



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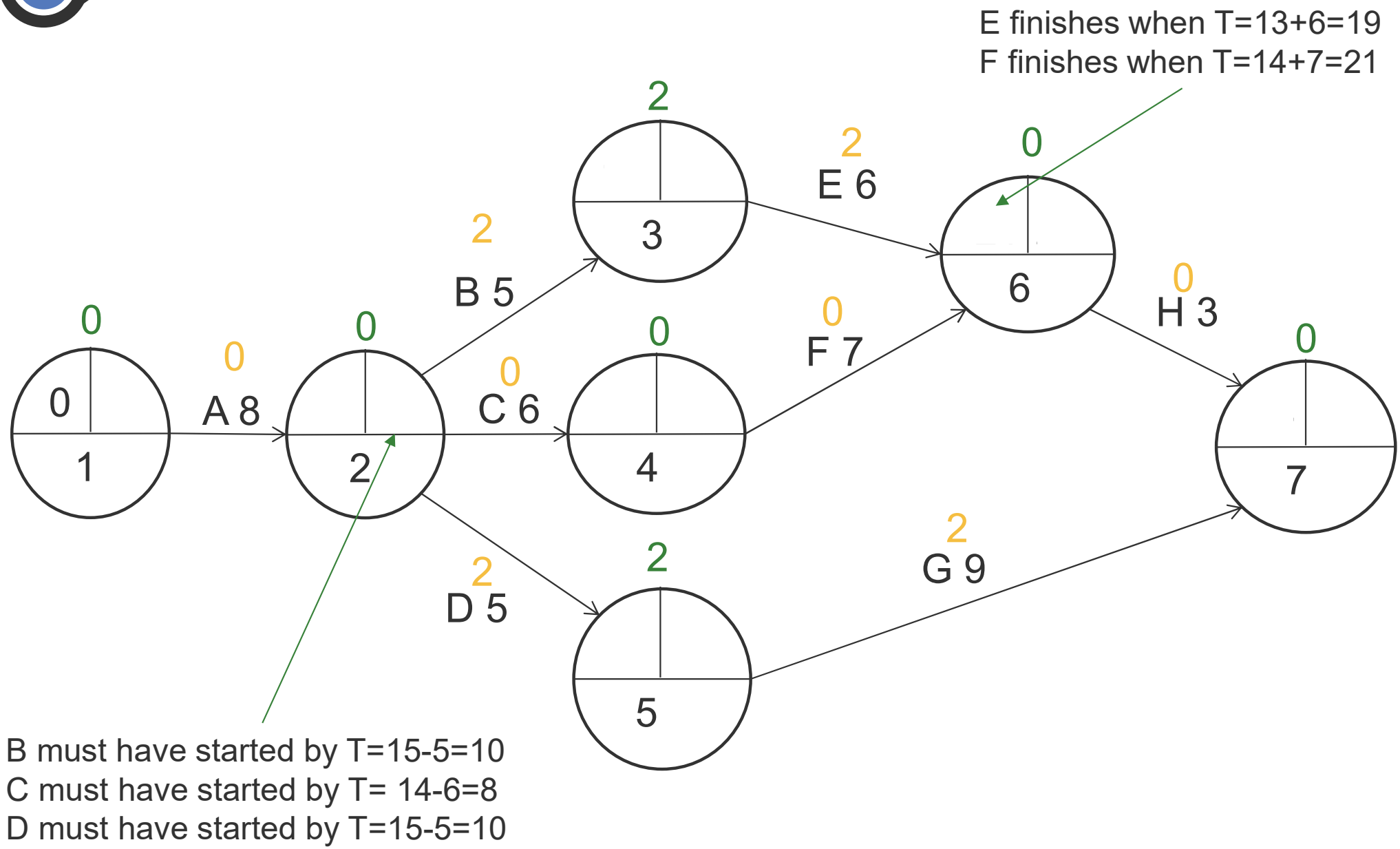
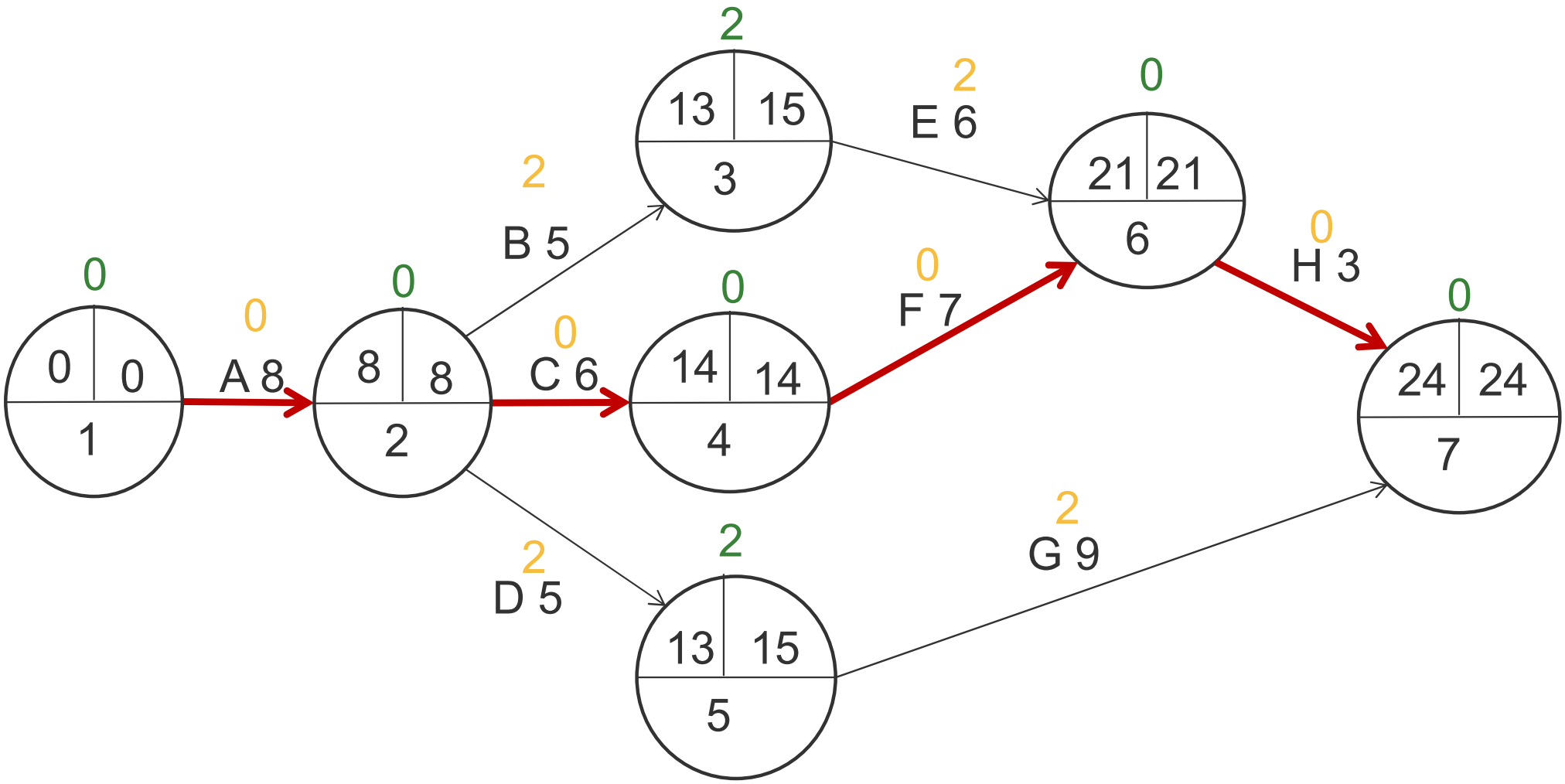
Earliest and latest times



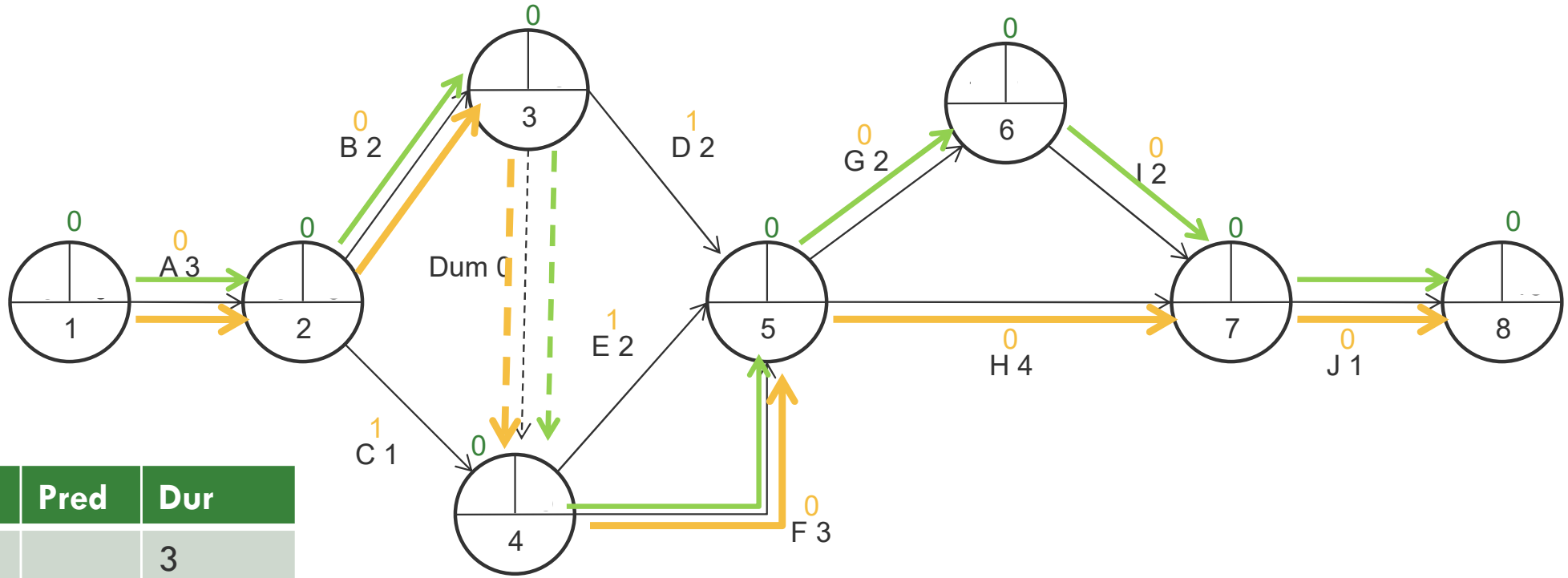
PERT Charts

Critical activities and critical path



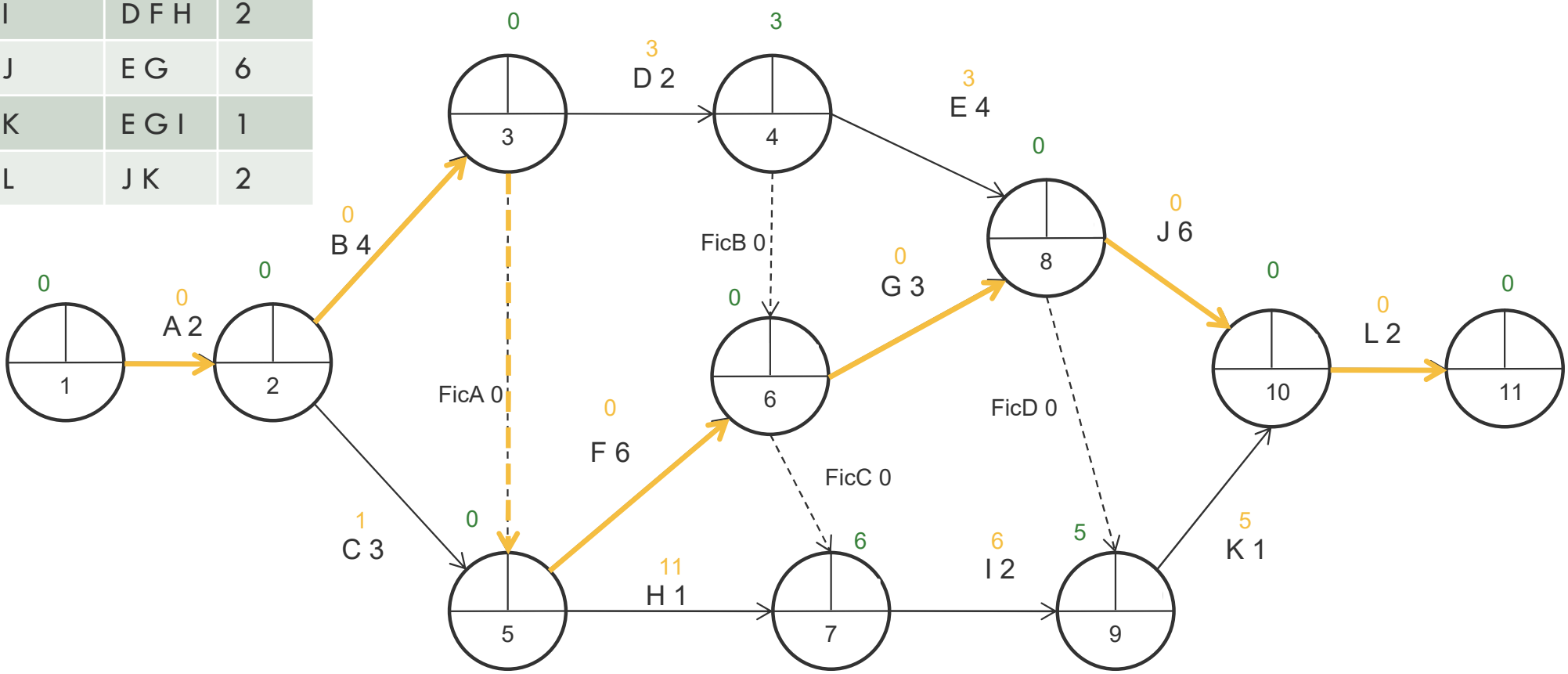
PERT Charts
Advantages

- Graphical representation
- Clear visualization of dependencies
- Options for complex dependencies
- Estimation of earliest and latest times
- Calculation of floats
- Identification of critical activities and paths

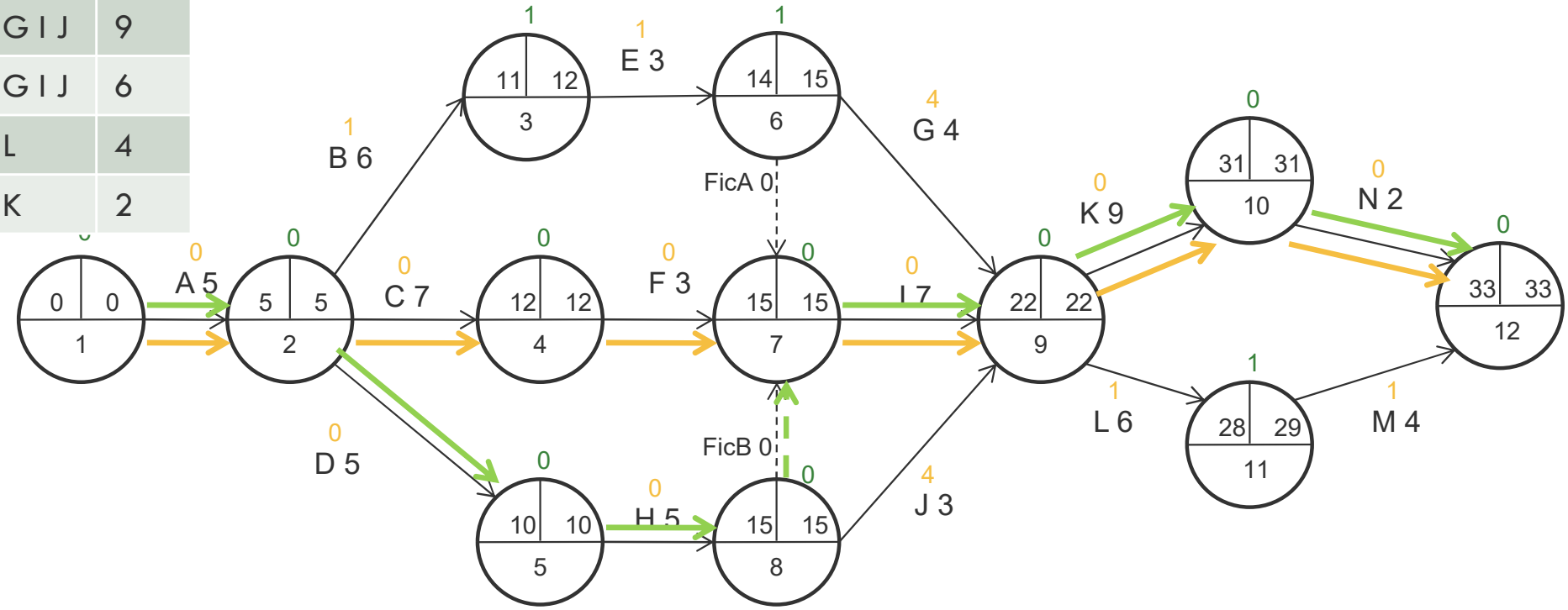


Activ	Pred	Dur
A		3
B	A	2
C	A	1
D	B	2
E	B C	2
F	B C	3
G	D E F	2
H	D E F	4
I	G	2
J	I H	1

Activ	Pred	Dur
A		2
B	A	4
C	A	3
D	B	2
E	D	4
F	B C	6
G	D F	3
H	B C	1
I	D F H	2
J	E G	6
K	E G I	1
L	J K	2



Activ	Pred	Dur
A		5
B	A	6
C	A	7
D	A	5
E	B	3
F	C	3
G	E	4
H	D	5
I	E F H	7
J	H	3
K	G I J	9
L	G I J	6
M	L	4
N	K	2



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