Business Studies
L5 - Project planning and management

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5. Project planning and management

Role of a manager

Charts and Critical Path Analysis

Estimation Techniques

Monitoring

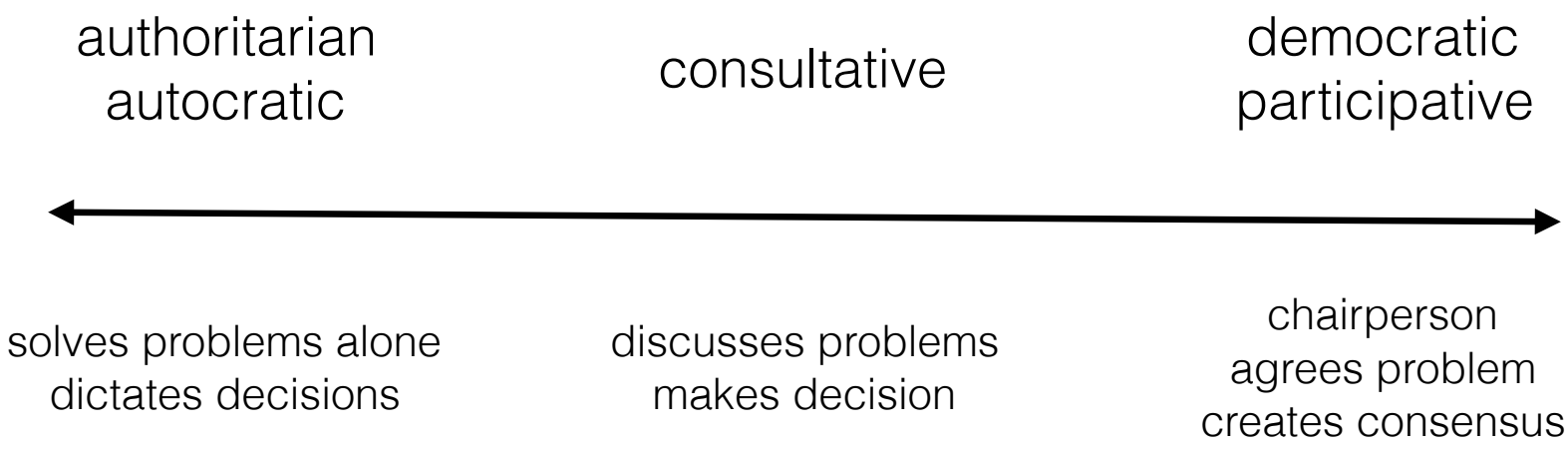
Role of a manager

Directs resources for the achievement of goals

LEADER also provides
- vision
- inspiration
- rises above the usual

No one right way to manage

Management Continuum



Managerial Roles

Henry Mintzberg (1939)

Interpersonal

Figurehead, leader, lisaison

Informational Roles

Monitor, disseminator, spokesperson

Decisional Roles

entrepreneur, resource allocator, disturbance allocator, negotiator

https://en.wikipedia.org/wiki/Henry_Mintzberg

Managerial and Leadership Qualities

Technical / Professional knowledge
Organisational know-how
Ability to grasp situations
Ability to make decisions
Ability to manage change
Creative
Mental flexibility
Learns from experience
Pro-active
Moral courage
Resilience
Social Skills
Self Knowledge

Project Management Variable

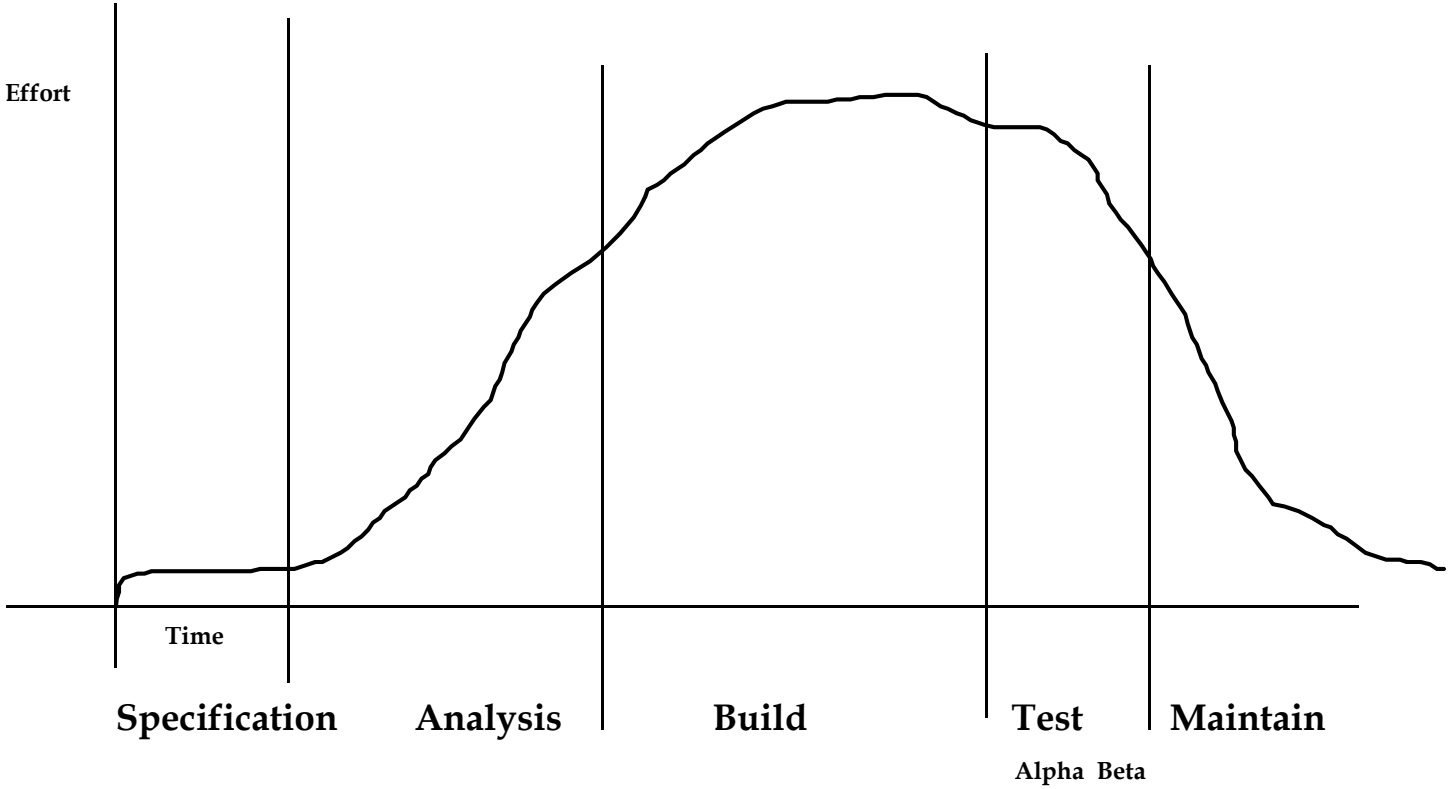
Resource

Time

Function

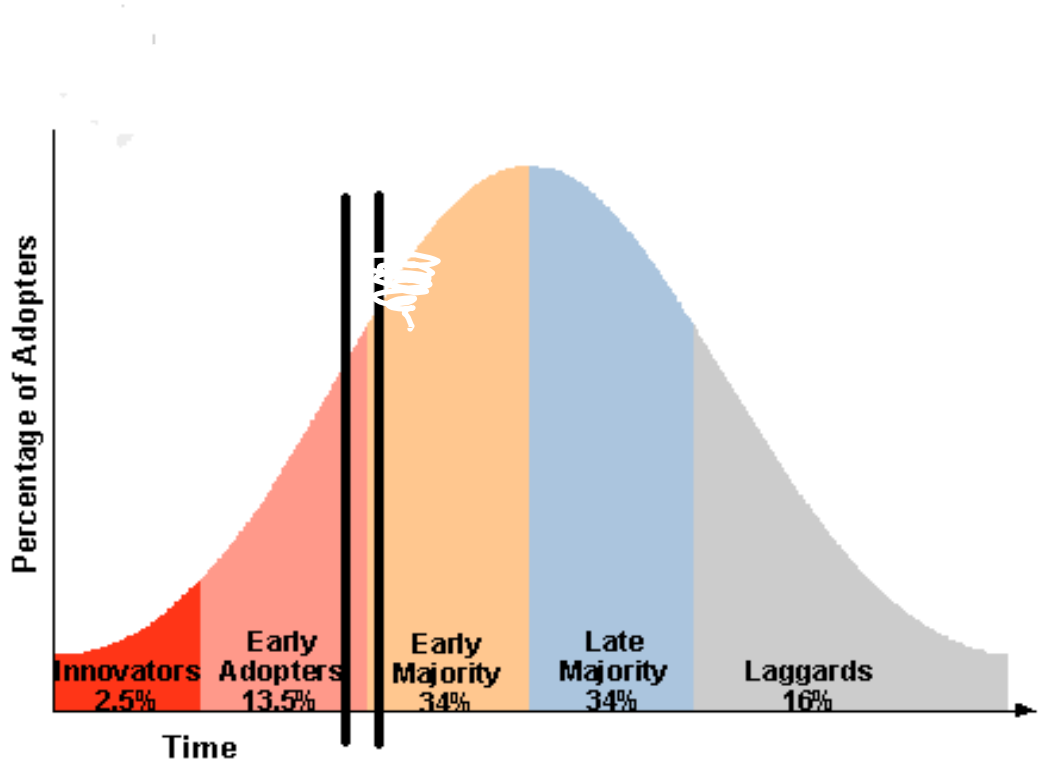
You can have any two of quick, good or cheap, but not all three.

Development cycle:



Crossing the Chasm

- Geoffrey Moore, after Everett Rogers



Approaches and methodologies

Top Down
- waterfall decomposition

Bottom Up
- meta machine

Rapid Prototype
- successive refinement
- agile engineering

Muddle through

In February 2001, 17 software developers met at the Snowbird resort in Utah to discuss lightweight development methods. They published the *Manifesto for Agile Software Development*, in which they said,

Agile explosion

https://en.wikipedia.org/wiki/Agile_software_development

Popular agile software development frameworks include

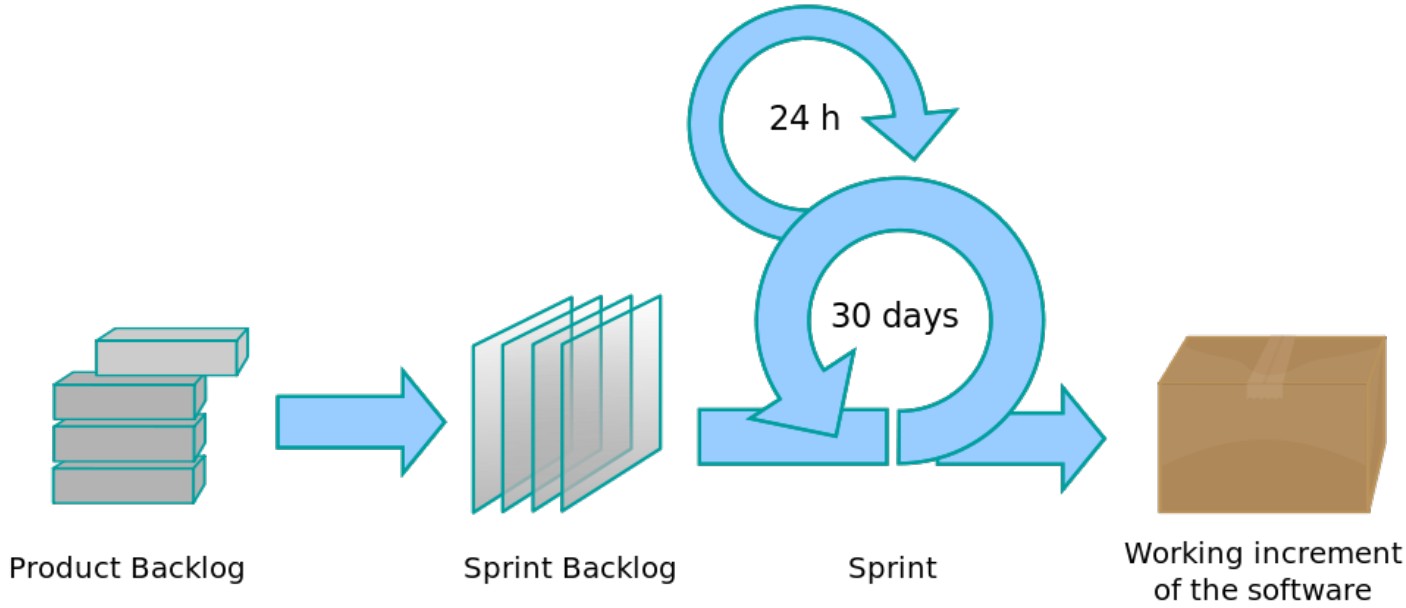
- Adaptive software development (ASD)
- Agile modeling
- Agile Unified Process (AUP)
- Crystal Clear methods
- Disciplined agile delivery
- Dynamic systems development method (DSDM)
- Extreme programming (XP)
- Feature-driven development (FDD)
- Lean software development
- Kanban
- Scrum
- Scrumban

- Acceptance test-driven development (ATDD)
- Agile modeling
- Backlogs (Product and Sprint)
- Behavior-driven development (BDD)
- Business analyst designer method (BADM)[37]
- Cross-functional team
- Continuous integration (CI)
- Domain-driven design (DDD)
- Information radiators (scrum board, task board, visual management board, burndown chart)
- Iterative and incremental development (IID)
- Pair programming
- Planning poker
- Refactoring
- Scrum events (sprint planning, daily scrum, sprint review and retrospective)
- Test-driven development (TDD)
- Agile testing
- Timeboxing
- User story
- Story-driven modeling
- Retrospective
- Velocity tracking
- User Story Mapping

The Agile Alliance has provided a comprehensive online guide to applying agile these and other practices.

https://www.agilealliance.org

Scrum, Sprints, Timeboxes



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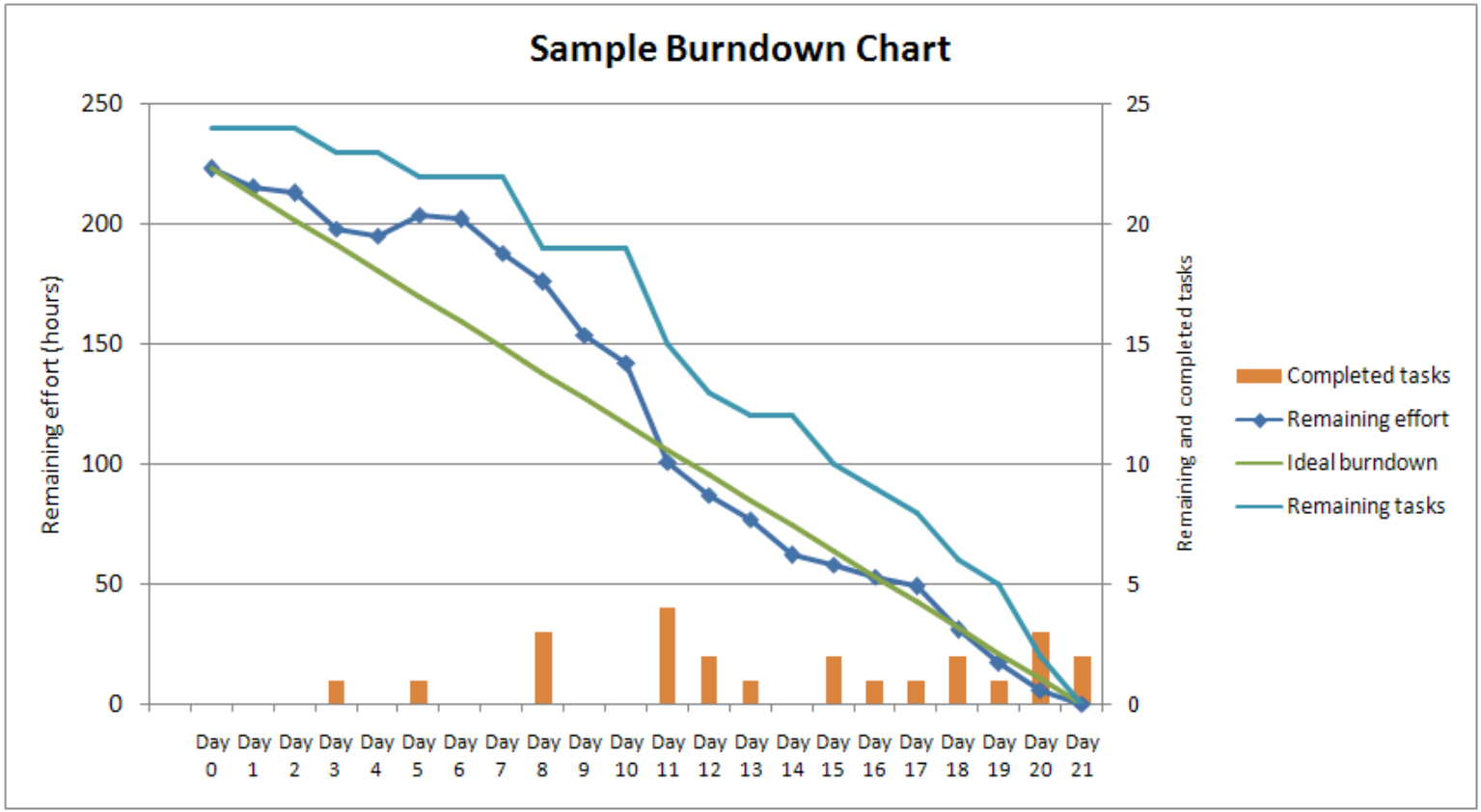
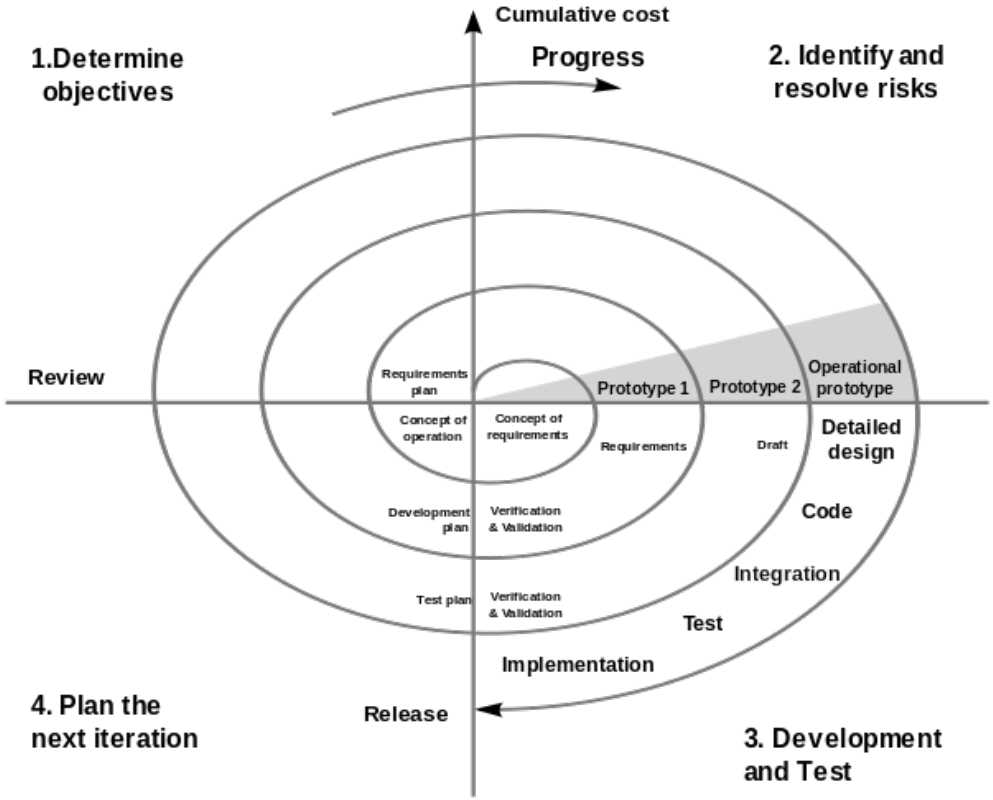

Sample Burndown Chart
Remaining effort (hours)
250
200
150
100
50
0
25
20
15
10
5
0
Remaining and completed tasks
Completed tasks
Remaining effort
Ideal burndown
Remaining tasks
Day 0
Day 1
Day 2
Day 3
Day 4
Day 5
Day 6
Day 7
Day 8
Day 9
Day 10
Day 11
Day 12
Day 13
Day 14
Day 15
Day 16
Day 17
Day 18
Day 19
Day 20
Day 21

Spiral Methodology



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Microsoft Solutions Framework 4.0

adapted from http://slideplayer.com/slide/6868969/

	Deliverables	Goals
Envision	Vision / scope document Project structure document Initial risk assessment document	Develop a clear understanding of what is needed within context of project constraints Assemble necessary team to envision solution with options and approaches to meet needs given constraints
Plan	Functional specifications Master project plan Master project schedule	Evolve conceptual solution into tangivle designs and plans so it can be built in the build phase
Build	Completed solution Training materials Documentation Marketing materials Updated master plan, schedule and risk documentt	Build various aspects of the solution in accordance with plan track deliverables
Test	Proactive - leads build effort Supportive - follows build effort	Expose issues, uncover design flaws and identify unexpected behaviour
Stabilise	Pilot review Release-ready versions of solutions and accompanying collateral Testing and bug reports Project documents	Improve solution quality to meet release criteria for deployment to production Validate solution meets stakeholder needs Validate solution usability
Deploy	Operations and support information systems Revised processes and procedures Repository of all solution collateral	Place solution into production at designated environments Facilitate smooth transfer of solution from project team to operations team as soon as possible

Scrum Meetings

Daily Scrum

Scrum of scrums

Sprint Planning Meetings

Sprint Review Meetings

Sprint Retrospective

Pert and Gantt Charts

Visual representation of project

Microsoft Project

Example: Getting up in the morning

Task	Duration (mins)
1 Alarm rings	0
2. Wake Up	3
3. Get out of bed	5
4. Wash	5
5. Get dressed	5
6. Put kettle on	2
7 Wait for kettle to boil	5
8 Put toast on	2
9 Wait for Toast	3
10 Make coffee	3
11 Butter Toast	2
12 Eat Breakfast	10
13 Leave for Lectures	0

Pert Chart


Get out of bed
8:56am 8:56am
8:56am 8:56am
Wash
8:56am 9:01am
8:56am 9:01am
Get dressed
9:01am 9:06am
9:01am 9:06am
Put Kettle on
9:06am 9:09am
9:09am 9:12am
Wait for kettle to boil
9:09am 9:14am
9:12am 9:17am
Make Coffee
9:14am 9:17am
9:17am 9:20am
Eat Breakfast
9:20am 9:30am
9:20am 9:30am
Put toast on
9:06am 9:11am
9:06am 9:11am
Wait for Toast
9:11am 9:16am
9:11am 9:16am
Butter Toast
9:16am 9:20am
9:16am 9:20am
Leave for Lectures
9:30am 9:30am
9:30am 9:30am

Critical Path Analysis

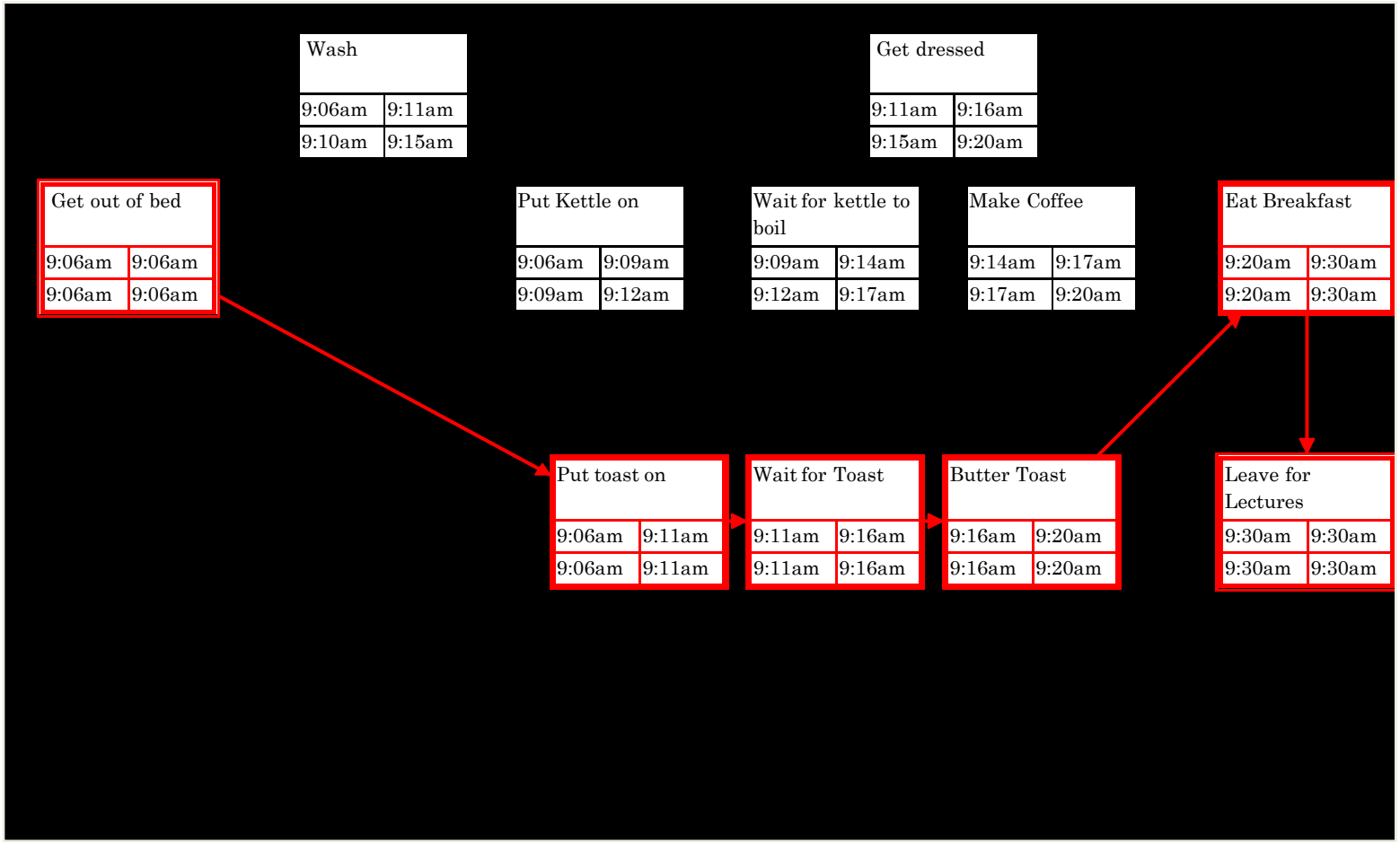
Compute earliest and latest start / finish for each task

The difference is the slack

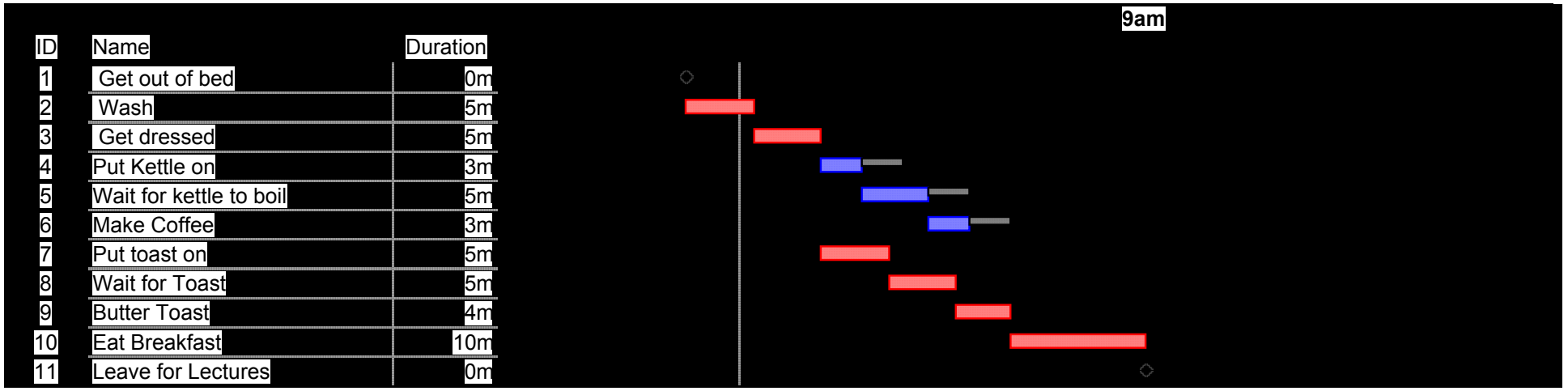
The Critical Path joins the tasks for which there is no slack

Any delay in tasks on the Critical Path affects the whole project

Pert Chart

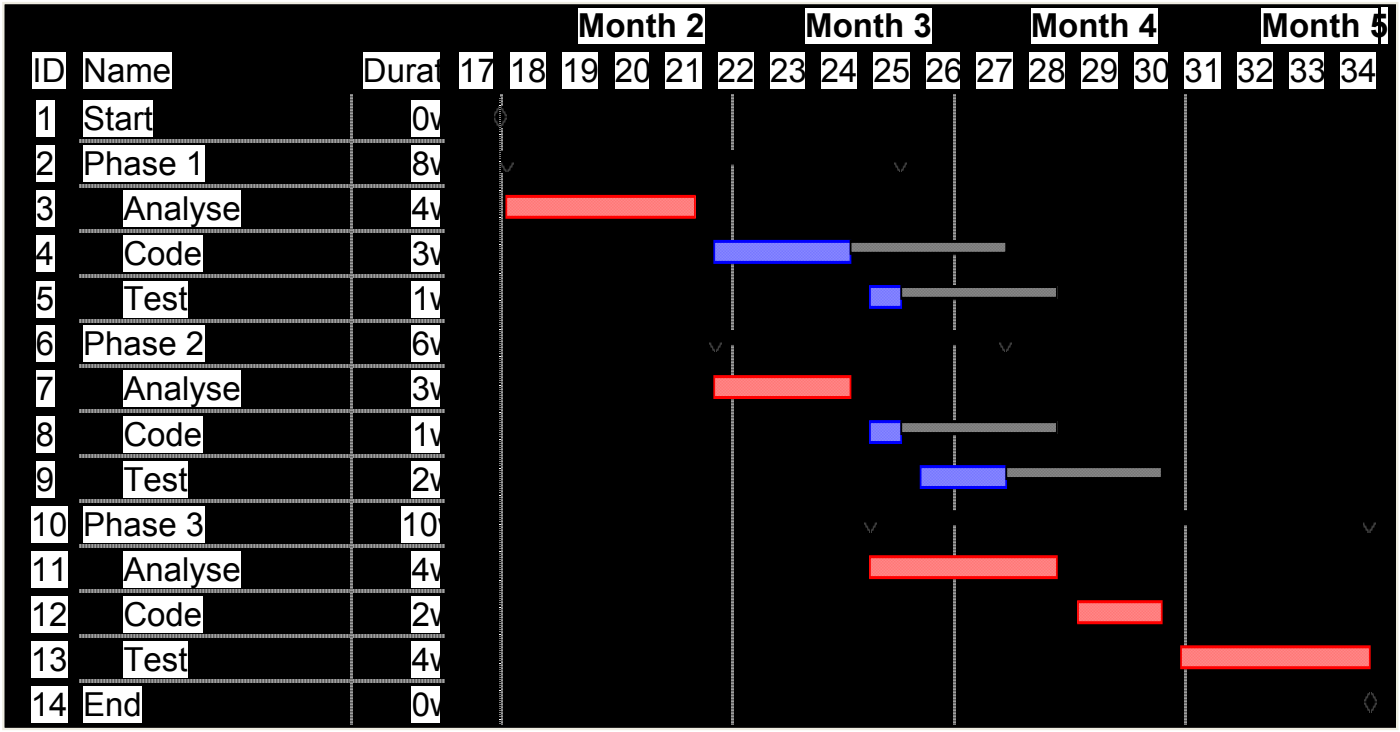

Wash
9:06am 9:11am
9:10am 9:15am
Get dressed
9:11am 9:16am
9:15am 9:20am
Get out of bed
9:06am 9:06am
9:06am 9:06am
Put Kettle on
9:06am 9:09am
9:09am 9:12am
Wait for kettle to boil
9:09am 9:14am
9:12am 9:17am
Make Coffee
9:14am 9:17am
9:17am 9:20am
Eat Breakfast
9:20am 9:30am
9:20am 9:30am
Put toast on
9:06am 9:11am
9:06am 9:11am
Wait for Toast
9:11am 9:16am
9:11am 9:16am
Butter Toast
9:16am 9:20am
9:16am 9:20am
Leave for Lectures
9:30am 9:30am
9:30am 9:30am

Gantt Chart

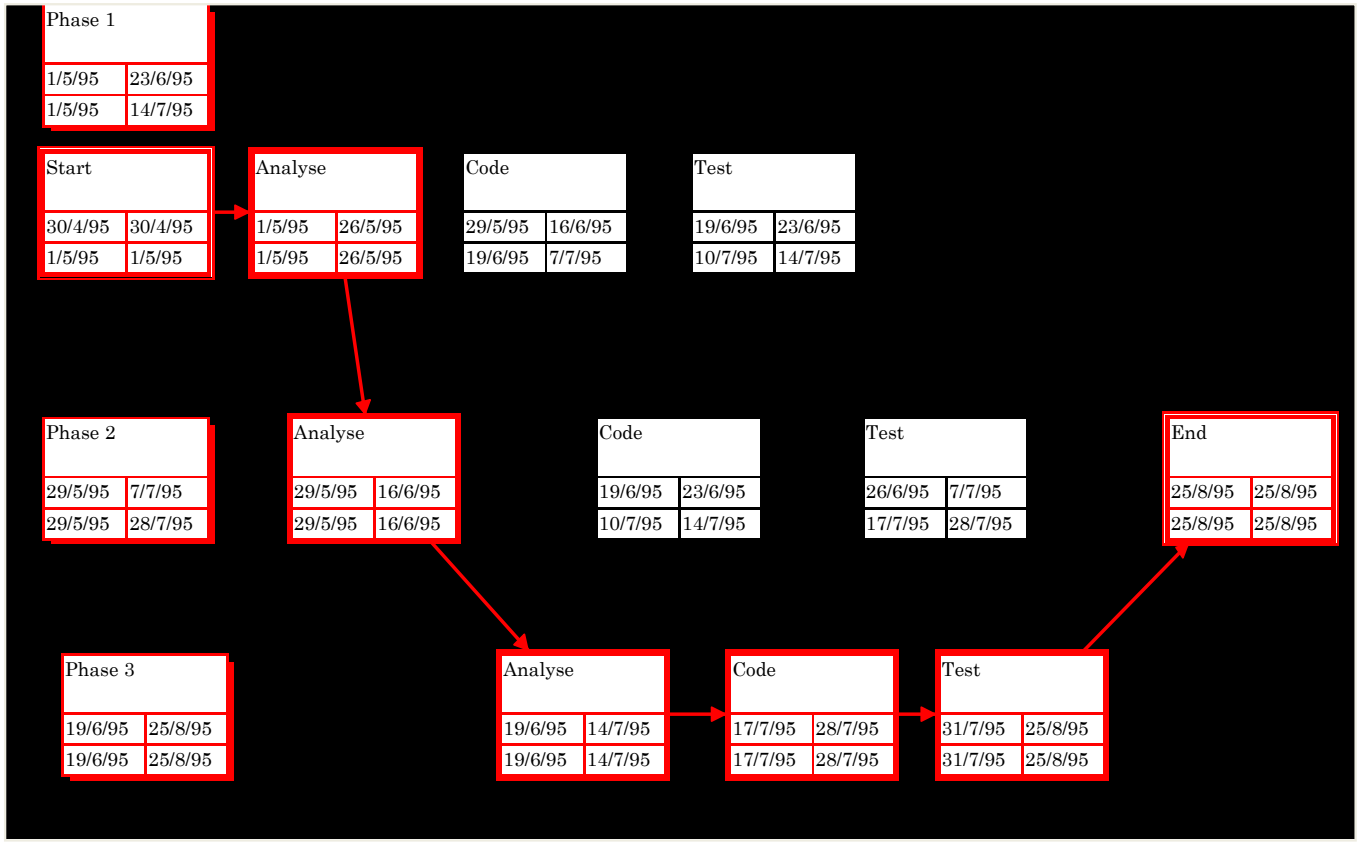


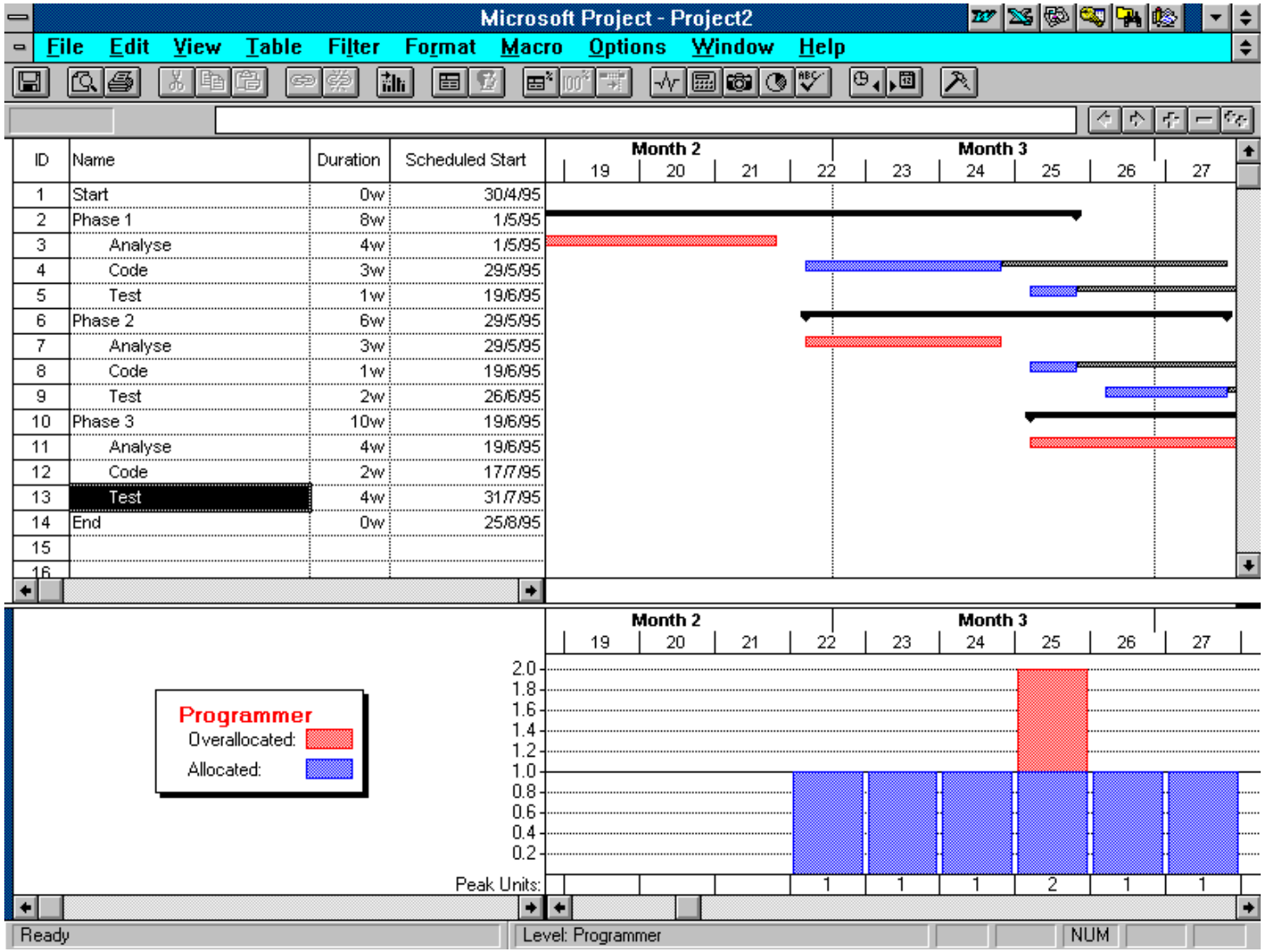
ID	Name	Duration
1	Get out of bed	0m
2	Wash	5m
3	Get dressed	5m
4	Put Kettle on	3m
5	Wait for kettle to boil	5m
6	Make Coffee	3m
7	Put toast on	5m
8	Wait for Toast	5m
9	Butter Toast	4m
10	Eat Breakfast	10m
11	Leave for Lectures	0m

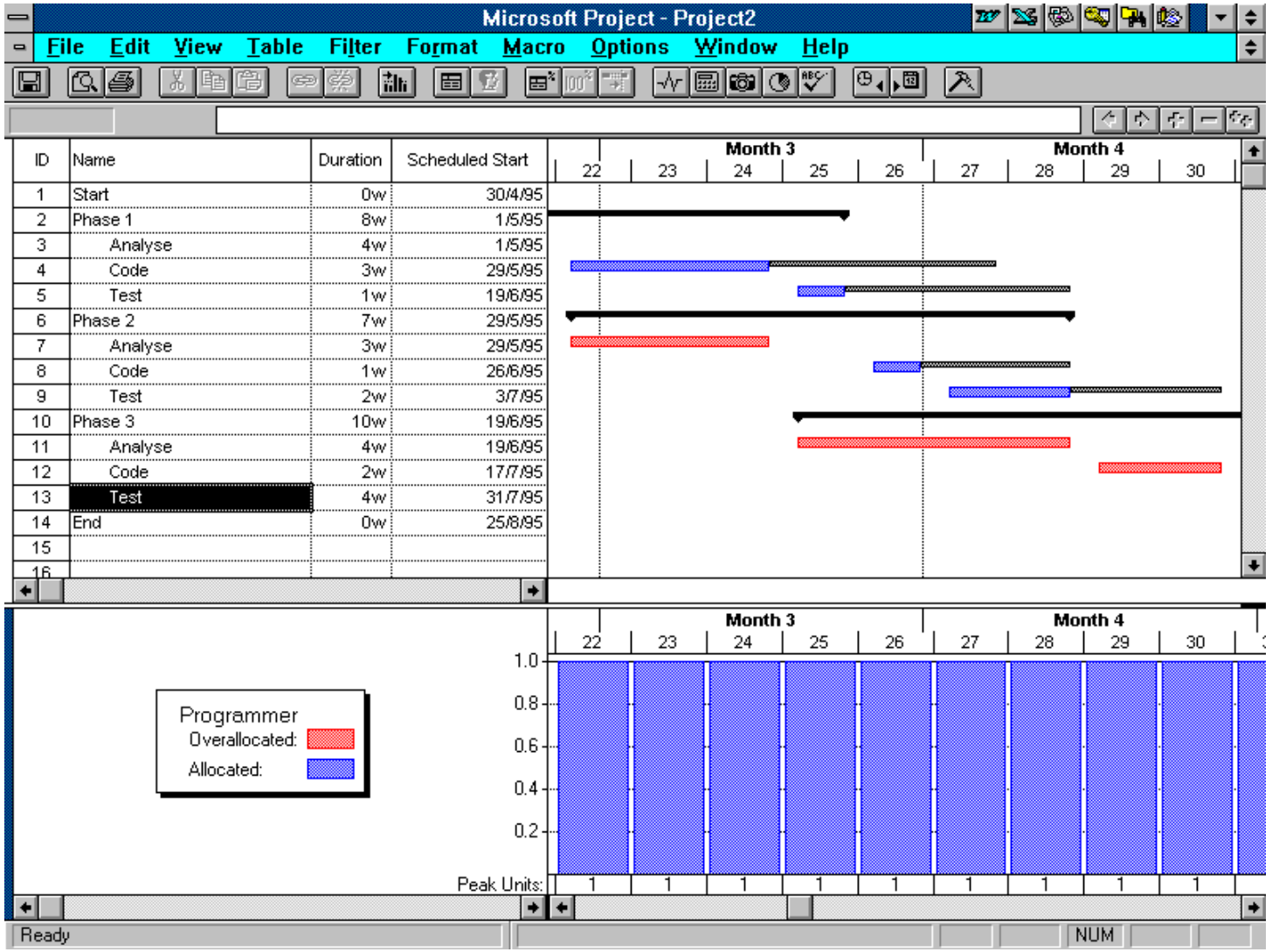
Example


Month 2
Month 3
Month 4
Month 5
ID
Name
Durat
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
1 Start 0v
2 Phase 1 8v
3 Analyse 4v
4 Code 3v
5 Test 1v
6 Phase 2 6v
7 Analyse 3v
8 Code 1v
9 Test 2v
10 Phase 3 10v
11 Analyse 4v
12 Code 2v
13 Test 4v
14 End 0v

Example Pert




Microsoft Project - Project2
File Edit View Table Filter Format Macro Options Window Help
ID Name Duration Scheduled Start
1 Start 0w 30/4/95
2 Phase 1 8w 1/5/95
3 Analyse 4w 1/5/95
4 Code 3w 29/5/95
5 Test 1w 19/6/95
6 Phase 2 6w 29/5/95
7 Analyse 3w 29/5/95
8 Code 1w 19/6/95
9 Test 2w 26/6/95
10 Phase 3 10w 19/6/95
11 Analyse 4w 19/6/95
12 Code 2w 17/7/95
13 Test 4w 31/7/95
14 End 0w 25/8/95
Month 2
Month 3
19 20 21 22 23 24 25 26 27
Programmer
Overallocated:
Allocated:
2.0 1.8 1.6 1.4 1.2 1.0 0.8 0.6 0.4 0.2
Peak Units:
1 1 1 2 1 1
Ready
Level: Programmer
NUM


Microsoft Project - Project2
File Edit View Table Filter Format Macro Options Window Help
ID Name Duration Scheduled Start
1 Start 0w 30/4/95
2 Phase 1 8w 1/5/95
3 Analyse 4w 1/5/95
4 Code 3w 29/5/95
5 Test 1w 19/6/95
6 Phase 2 7w 29/5/95
7 Analyse 3w 29/5/95
8 Code 1w 26/6/95
9 Test 2w 3/7/95
10 Phase 3 10w 19/6/95
11 Analyse 4w 19/6/95
12 Code 2w 17/7/95
13 Test 4w 31/7/95
14 End 0w 25/8/95
15
16
Month 3
Month 4
22 23 24 25 26 27 28 29 30
Programmer
Overallocated:
Allocated:
1.0
0.8
0.6
0.4
0.2
Peak Units:
1 1 1 1 1 1 1 1 1
Ready
NUM

Levelling

Adjust tasks to match resources available

Automatic system available, but does not always give an optimum result

Tasks may be delayed within slack without affecting project dates

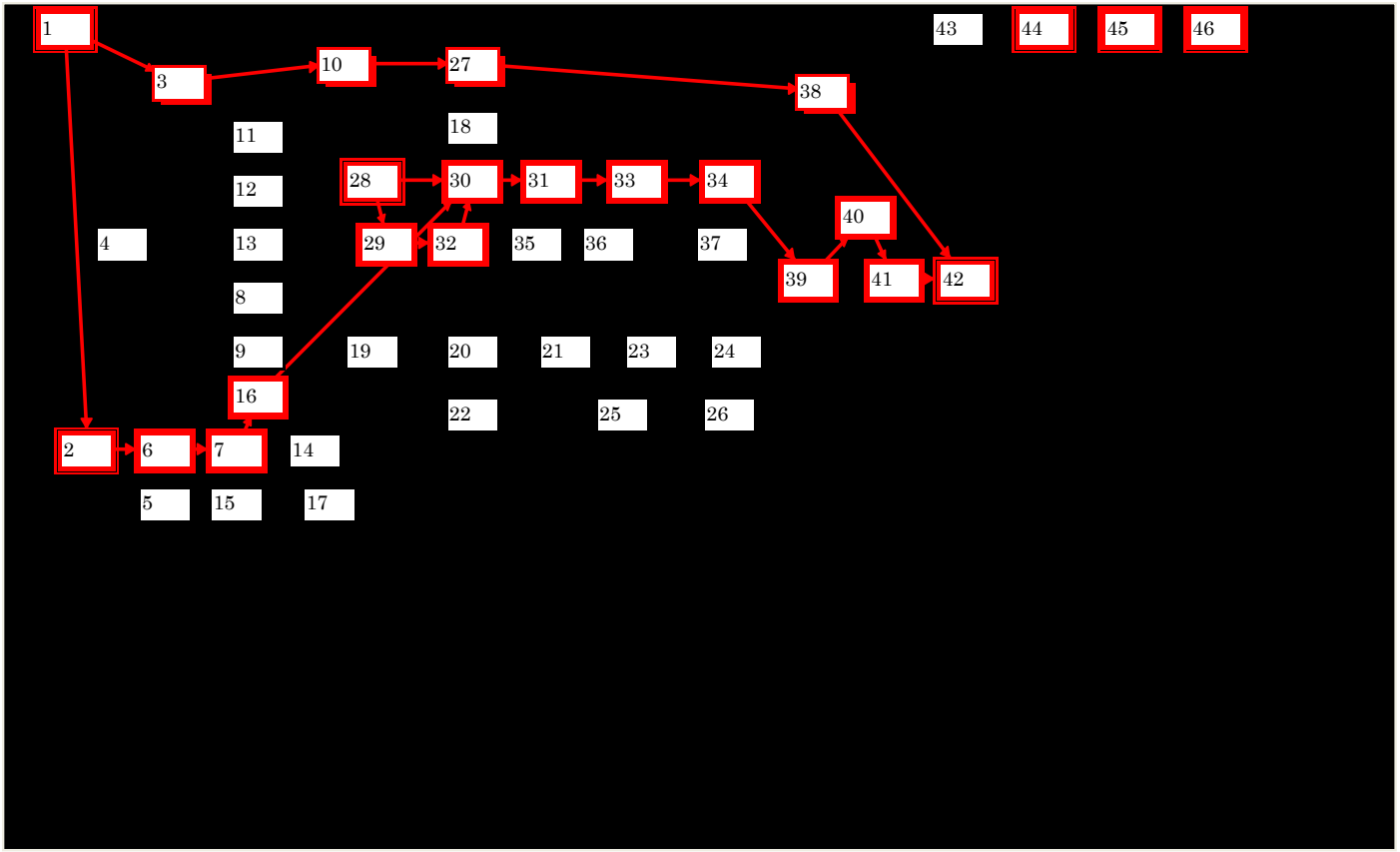
Otherwise consider extending project, or using more resource

Adding resource to a late project may cause RECURSIVE COLLAPSE

- consider carefully whether the benefits outweigh the additional learning delays and overheads

Derive costings

Larger example



Estimation Techniques

Experience

Comparison with similar tasks

- 20 lines of code / day
- can vary by 2 orders of magnitude

Decomposition

Plan to throw one away

20 working days per month BUT 200 per year

Rules of Thumb

Software projects

estimate 10 x cost and 3 x time

1/3/10 rule

1 cost of prototype

3 cost of creating a product

10 cost of sales and marketing

Hartree's Law

The time to completion of any project, as estimated by the project leader, is a constant (Hartree's constant) regardless of the state of the project

A project is 90% complete 90% of the time

80% rule

Don't plan to use more than 80% of available resource

Cynic's Project Stages

Enthusiasm

Disillusionment

Panic

Persecution of the innocent

Praise of the bystander