# The Software Process

Software development is broken into phases (here we only consider object-oriented software development):

- Requirements Gathering
- Object-Oriented Analysis
- Object-Oriented Design
- Implementation
- Integration
- Maintenance
- Retirement

Notes:

- No testing phase – testing happens at each phase.
- No documentation phase – documentation is generated at each phase throughout the development.

## *Requirements Gathering*

Assumption – the software being considered is economically justifiable – the job of the customer. During requirements gathering determine what the client *needs*, not what the client wants – concept exploration

Testing – rapid prototyping.

Documentation

- Rapid prototype
- Requirements document

## *Object-Oriented Analysis*

Analysis

- Determine *what* the product is supposed to do – use cases, scenarios
- Extract high-level objects
- Extract formal specification of system behavior

Testing – requirements traceability, review

Documentation – high-level design document.

## *Object-Oriented Design*

Analysis – what
Design – how

Many different aspects:

- Detailed class diagrams
- Sequence diagrams
- Collaborative diagrams

Testing – requirements traceability, review

Documentation – design documentation

## *Implementation*

Implement detailed design in code

Testing – review, test cases (formal and informal)

Documentation – source code, test cases (with expected outcome)

## *Integration*

Combine objects/modules and check product as a whole.

Testing

- Product testing
- Acceptance testing (special test cases stipulated by customer)

Documentation

- Commented source code
- Test cases for product as a whole

## *Maintenance*

- Maintenance is any change to the software system once the client has accepted the software.
- Most money and effort is devoted to this phase
    - Most expensive phase to change code and fix problems

Testing – regression testing

Documentation

- Record of all changes made and why
- Regression test cases

## ***Retirement***

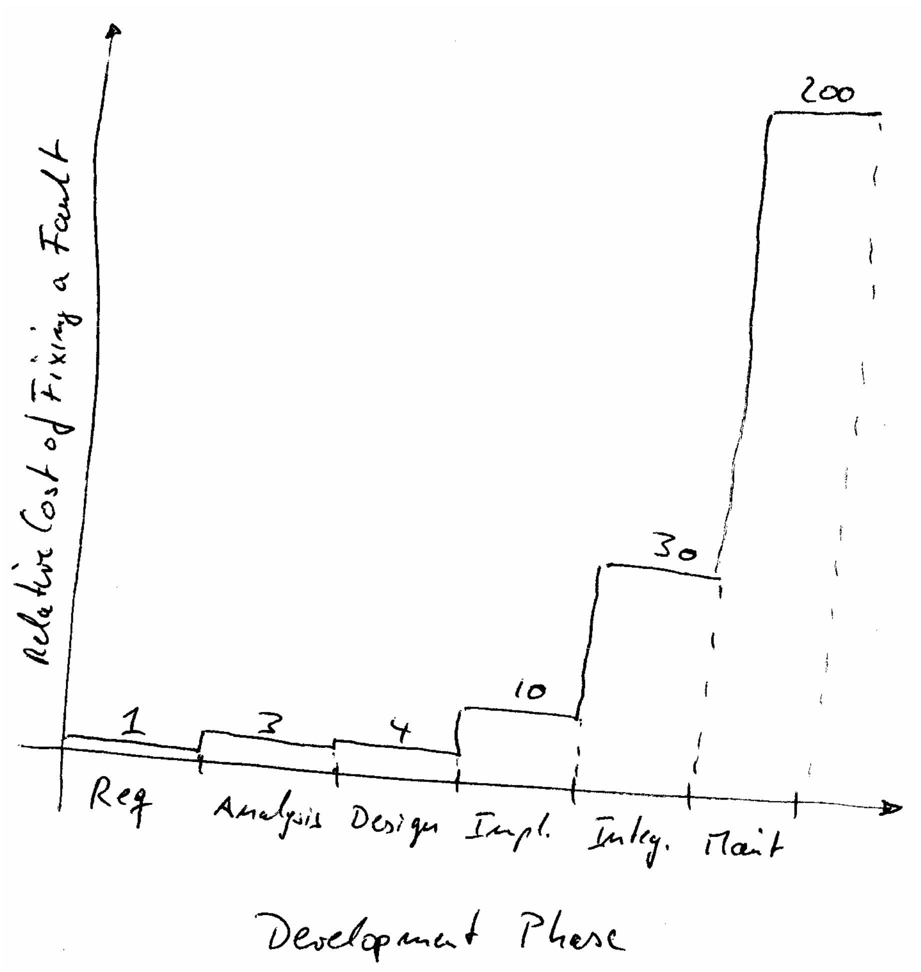
Good software is maintained,
But software becomes unmaintainable because:

- A drastic change in design has occurred
- The product has to be implemented on a totally new hardware platform/operating system
- Documentation is missing or inaccurate

Note: true retirement is rare.

## The Cost of Fixing a Software Problem

There is an interesting relationship between development phase and fault repair cost.



Therefore, there is a real (as in monetary) motivation to find and fix as many issues/problems as early in the development process as possible.