

## Software Development Life Cycle

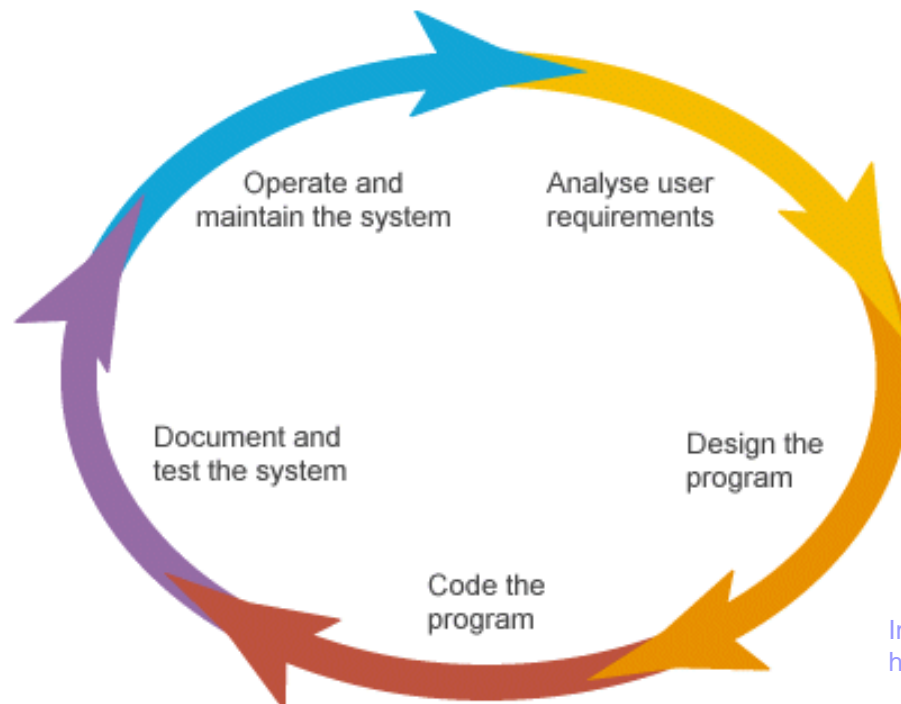


Image Source:  
<http://www.technologyuk.net/>

## Overview

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- Software Development
- Phases of Software Development
- Aspects of Software Quality
- Some Additional Online Resources

## Software Development

- **Software Engineering**: study of the techniques and theory that support the development of high-quality software
- We have an entire course on this ...
- End result: we are looking to meet the needs of the:
  - client (person or organization)
  - user (the people using the software)
- Why is this important for us in UNIV 103

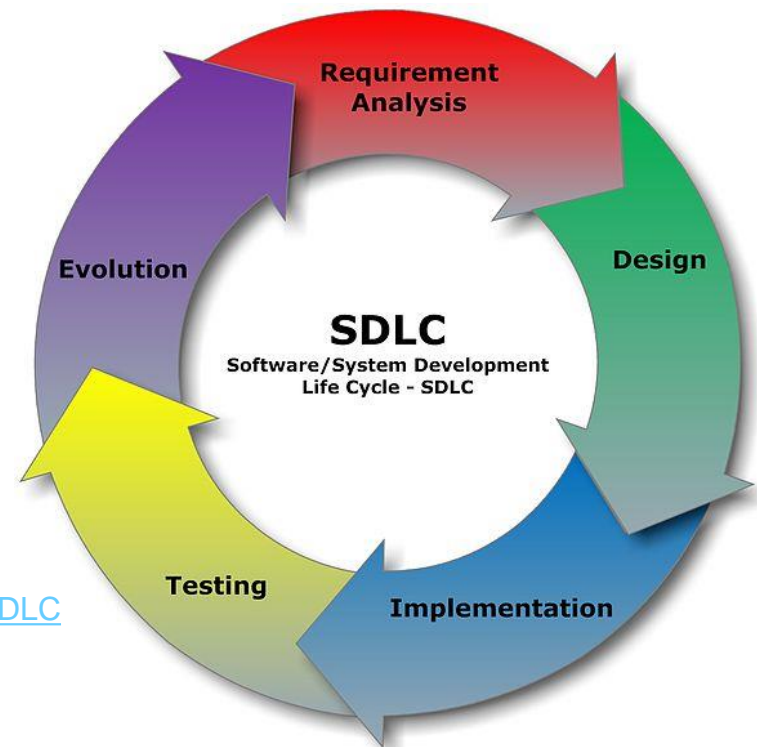
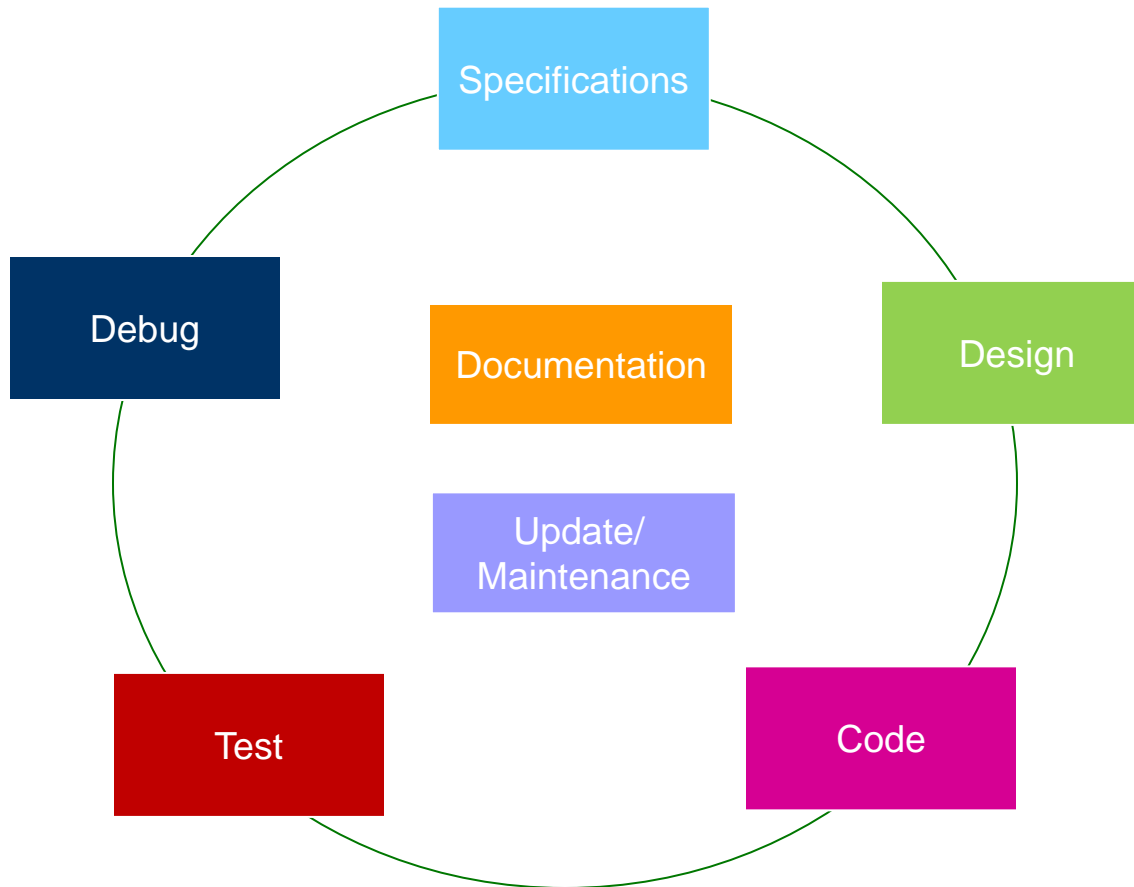


Image source: <http://en.wikipedia.org/wiki/File:SDLC>

## Phases of Software / Systems Development Life Cycle (SDLC)

- Here is a typical list of what you are responsible for as a software developer: at some point you will be involved in some or all aspects of this development ...
- Specification of the task – it doesn't help if you are solving the wrong problem
- Design of a solution
- Implementation of the solution i.e. the code
- Testing and Analysis of the solution
  - A **unit test** checks to see if a method works as expected all by itself.
  - An **integration test** checks to see if a method works in combination with other methods – and test for any undesirable side effects
- Debugging
- Maintenance and evolution of the system

## SDLC – arrows ....



## Phases of Software Development: Design

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*“You’ve got to be very careful if you don’t know where you’re going, because you might not get there.” ~ Yogi Berra*

- There are different techniques to design methods/ solutions for new software, e.g
  - top-down
  - bottom-up
- Common tools for computer scientists and engineers include:
  - flowcharts,
  - pseudocode
- Objects are chosen from
  - libraries or
  - methods for new objects must be implemented.

## Phases of Software Development: Code

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- ... and only then do you begin to code

### Lifelong Resources

- Best practices you are learning in all your classes
- Always be on the lookout for additional resources e.g.
  - established forums (specific forums for specific aspects of CS)
  - reference books (look through reviews)
    - [The Mythical Man-Month: Essays on Software Engineering](#)
  - free online books/ white papers
  - ACM
  - IEEE
- The clearer your understanding of the problem or specification/ the better your design will be/ and the better your coding will be ... the better the ...

## ***Phases of Software Development: Documentation***

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- Throughout the entire process ...



## *Aspects of Software Quality: endgame is a quality product*

Quality Characteristic	Description
Correctness	The degree to which software adheres to its specific requirements.
Reliability	The frequency and criticality of software failure.
Robustness	The degree to which erroneous situations are handled gracefully.
Usability	The ease with which users can learn and execute tasks within the software.
Maintainability	The ease with which changes can be made to the software.
Reusability	The ease with which software components can be reused in the development of other software systems.
Portability	The ease with which software components can be used in multiple computer environments.
Efficiency	The degree to which the software fulfills its purpose without wasting resources.

**FIGURE 1.1** Aspects of software quality



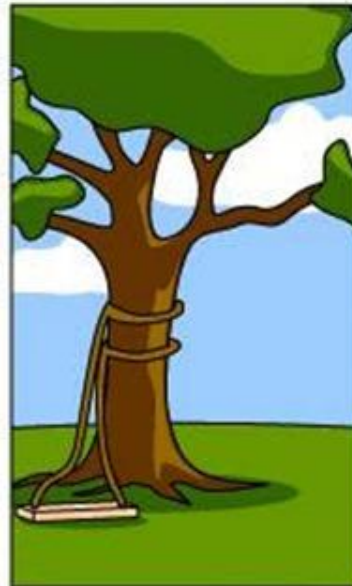
How the customer explained it



How the Project Leader understood it



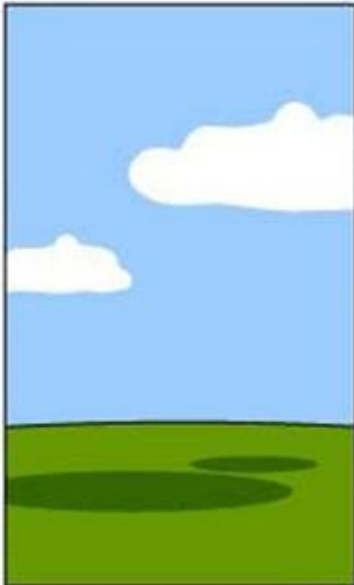
How the Analyst designed it



How the Programmer wrote it



How the Business Consultant described it



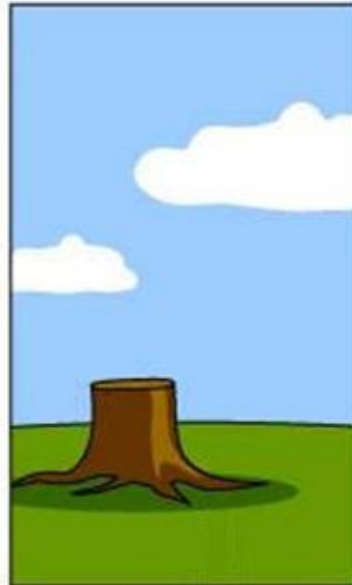
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

## ***Some (of the many) Additional Online Resources***

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- <http://www.amazon.com/Mythical-Man-Month-Software-Engineering-Anniversary/dp/0201835959>
- <http://www.craigarman.com/wiki/downloads/misc/history-of-iterative-larman-and-basili-ieee-computer.pdf>
- <http://softwaretesting-qaqc.blogspot.com/2012/12/sdlc-models.html>
- <http://www.engiblogger.com/software/software-development-life-cycle-sdlc-models/>
- <http://softwaremethodologies.blogspot.com/2009/04/advantages-disadvantages-of-various.html>
- [www.youtube.com/watch?v=ga-byyTWhPg](http://www.youtube.com/watch?v=ga-byyTWhPg)
- <http://codebetter.com/raymondlewallen/2005/07/13/software-development-life-cycle-models/>
- <http://www.onestopqa.com/resources/SDLC%20Models.pdf>