

Computer Programming

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Session: Introduction to Software Engineering

Overview



- Programs written to make computers work for us, are collectively referred to as Software
- As the size of software becomes large, we need special techniques to manage software development, usage, and maintenance
- In this and the following session, we will discuss concepts of Software Engineering, to handle such large systems
- In this session, we will introduce some basic terms

Categories of Software



- System Software
- Application Software
- Embedded software
- Web applications

System Software



- Operating System
- Compilers for Programming Languages (3GL)
- 4GL (SQL used in Data Bases)
- Rapid Application Development (RAD) Tools
 - IDE (Integrated Development Environment)
- Scripting languages
 - HTML, JavaScript, XML, ...

Tools To Build Software Keep Evolving

Application Software



- Software written to solve practical problems
 - Determines functionality needed by people
- Accounting, Payroll, Inventory Control
- Software for operations of Banks (Core banking)
- Railway and Airlines reservation system
- Simulators, Equation solvers, genome sequencing

Software is characterized by large size, has complex functions, is used by a large number of people, and requires significant time and efforts

- Packaged Software, customized to local requirements
- Bespoke Development

Embedded Systems



Software inside any gadget or appliance

- Washing machine, TV set, watch, camera, lift, car, aircraft, ...
- Equipment in manufacturing Plant
- Medical instruments and equipment
- Some special characteristics of Embedded Software
 - Code size has to be 'compact'
 - Changes in versions are difficult
 - Development cycle is longer

Web Applications



- Application software, where
 - End-user has a web (browser) based interface
 - Connects to one or more back-end systems through network
- Distributed applications
 - Go to airlines reservation site to book a ticket
 - Guided to a payment system gateway
 - Further guided to your bank or credit card system
 - May be guided to other sites such as hotel booking
- Applications have to interface and interact with each other

Summary



- We have studied categories of software
- We understand that large coordinated efforts are required to build, operate and maintain software