C++ Introduction

Roll Call

Syllabus

Determine additional days for labs, and lecture

Introduction to Software:

Abstraction as described by Prof. Anant Agarwal

Abstraction From Hardware to Software

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Physical Laws | Lump Abstraction | Digital Gates | Combination  Logic Blocks | Clocked | Instructions | Language Abstraction | Operating System | Programs |
| V = IR | Resistors  Capacitor  Voltage Source | And,  Or,  Not | Adder, Mux, Control | Latch, Flip-Flop,  SRAM | X86  SPARC,  ARM | C++, Java | Windows,  Linux | Word, Chrome,  Games |

In Principle Generation of software programs is tackled through similar abstractions

|  |  |  |  |
| --- | --- | --- | --- |
| Fundamental Instructions | Functions | Objects | Library |
| Branch  Repeat  Data  Operation | Accelerate  Brake  Shift  Steer  Body Shape | Luke's Car  Yugo  Reliant Robin | Unsafe Car Library |

Lecture Contents

Programming like recipe

* Large Problem break it into sub problems
* Step by Step, unambiguous
* Data: Information used by the program (Ingredients)
* Algorithm: The way in which the program processes the data (Method to Cook)

History of C++:

Developed in 1979 by Bell Labs

C developed around 1970 by Dennis Ritchie

Computer programming (often shortened to programming, scripting, or coding) is the process of designing, writing, testing, debugging, and maintaining the source code of computer programs.

Go Through Components of a Computer

* Memory
* Hard drive
* Processor
* Keyboard/Input

Machine Code

* Binary
* Broken into Opcodes
* Introduction to binary to decimal conversion and back

Low-Level Language:

* works directly with the hardware
* platform specific
* example is assembly
* Converted directly into machine language

High-Level Language

* Oriented towards solving problem solving
* Platform independent
* Compiled



C++

Hello World, Sequential-Procedural

High Level Language

Advantage of High Level Language (Ease of Understanding)

Compiler, Linker, Libraries

Programming Flow