**COSC Chapter 1 Notes**

A **computer** is an electronic device, operating under the control of instructions stored in its own memory

**Information Processing Cycle**

The **compiler** is a system program used to translate source code into machine codes. Compiler is also called the language translator.

Computer Software

Software, also called a program, are instructions that tell the computer what tasks to perform and how to perform them

* System software – serves as the interface between the user, the application software, and the computer’s hardware
  + Operating system
  + Utility program
* Application software – consists of programs designed to make users more productive and/or assist with personal tasks
  + Business
  + Graphics and Multimedia
  + Home/Personal/Educational
  + Communications

Coding is created using high level languages and computers read low level languages such as binary (1s and 0s)

The Programmer’s Job

* Programmers help solve computer problems
* Employee or freelance
* Typical steps involved
  + Meet with user to determine

Software Developer Traits

* Analytical
* Communication skills
* Creativity
* Customer-service skills
* Detail oriented

Employment Opportunites

History of Programming Languages

Programming Languages for this Chapter:

* Machine Languages
* Assembly Languages

Programming Languages

Control Structures

* All computer programs are written using one or more of these basic control structures: **sequence**, **repetition**, and **selection**. Another term used for control structures are **logic** **structures**, because they control the logic flow of the program.

Sequence Structure

* The **sequence structure** directs the computer to process the program instructions, one after another, in the order in which they are listed in the program
* An **algorithm** is a FINITE number of step-by-step instructions that accomplish a task

Selection Structure

* The selection structure directs the computer to make a decision (evaluate a condition ), and then take an appropriate action based upon that decision
* The selection structure allows the programmer to evaluate data, therefore properly controlling the logic flow of the program
* Another name for the selection structure is the **decision structure**
* Example: stopping or going at a signal light

Repetition Structure

* The repetition structure, commonly called iteration or looping, directs the computer to repeat one or more program instructions until some condition is met
* This condition may be checked at the beginning or end of the set instructions to be processed dependent upon the language being used
* The repetition structure allows the programmer to repeatedly process a set of instructions, while only typing them in once

IPO Chart

* A chart used to basically describe the algorithm of the code before coding by using the Inputs, Processing, and Outputs
* Inputs – The information given by the problem that is the start of the algorithm
* Processing – The steps that transform the inputs into the outputs or final answer
* Outputs – The final answer created from the Inputs and Processing steps

Vocabulary

Algorithms – step-by-step procedures

Compiler – translator that converts high level language into low level language or “computer language” (binary (1s and 0s))

Logic Error – An error in the planning phase that does not prevent the code from being executed but prevents the code from producing the correct answer.

Programs – Directions and instructions given to a computer from humans

Programmers – The people who create these directions

Programming Languages – Special languages used by programmers to communicate directions to a computer

Syntax Error – An incorrect character or string misplaced or failed to be placed that prevents the code from being executed

Valid data – Data that the algorithm is expecting the user to enter

Invalid data – Data that the algorithm is not expecting the user to enter