CPE 112 – Introduction to Computer Programming

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UAH

Useful URLs

- http://www.ece.uah.edu/cpe112-online
- http://www.ece.uah.ece/courses/cpe112
- http://www.jbpub.com/dale

Overview of Programming

- Programming is telling computers what to do in a language they understand (instructions)
- Writing a program is done in two phases:
  - Problem solving
    - Analysis & specification
    - Algorithm
    - Verification
  - Implementation
    - Program
    - Testing
- An algorithm is a step-by-step procedure for solving a problem in a finite amount of time.

Car Starting Algorithm

1. Insert the key
2. Make sure the transmission is in Park (or Neutral)
3. Depress the gas pedal (and clutch)
4. Turn the key to the start position
5. If the engine starts within six seconds, release the key to the ignition position.
6. If the engine doesn't start in six seconds, release the key, gas pedal (and clutch), wait ten seconds, and repeat steps 3 through 6, but not more than five times.
7. If the car doesn't start, call the garage.

What is Programming?

- Algorithms get translated into computer programs.
- A programming language is a simplified (not necessarily easy to use) form of English that adheres to a strict set of grammatical rules.
- Algorithms may be translated
  - into different languages
  - by different people in different ways (styles)
- Documentation is an important part of the programming process.

Computer Terms & Definitions

- Machine language – sequences of 1s and 0s one computer understands
- Assembly language – low-level language (closer to human understanding) translated to one machine language by an assembler
- High-level language – language close to English (C++ is one of them) which may be translated to many different machine languages by compilers

Control Structures

- Sequential Processing (default)
- Selection (pick one of multiple choices)
- Loop (do things again and again)
- Subprogram (pass control over to another piece of code)

Ethics and Responsibilities in the Computing Profession

- Software Piracy – It is illegal to copy software without the permission of its creator.
- Privacy of Data – A computing professional has a responsibility to avoid taking advantage of special access that he or she may have to confidential data.
- Use of Computer Resources – Computing professionals have an ethical responsibility never to use computer resources without permission.
- Software Engineering – Programmers have a responsibility for developing software that is free from errors.

Helpful UNIX Commands

- Change Directory **cd** <directory name>

e.g. **cd** MYDOC (change to directory MYDOC)
cd (change to the home directory)
cd .. (change to the parent directory)

- List content of current directory **ls**
  e.g. **ls** MYDOC
- Display current working directory **pwd**
- Make a new directory **mkdir** <directory name>
- Delete a directory **rmdir** <directory name>

Helpful UNIX Commands (Continued)

- Rename a file **mv** <source> <destination>
  e.g. **mv** myfile.cpp dinner.cpp
- Delete a file **rm** <filename)
- Copy a file **cp** <source> <destination>
- Compile a file **CC** <source> **-o** <destination>
  e.g. **CC** dinner.cpp **–o** dinner
  (CC is capital and o is lower case)
- Shortcut to repeat a command **!**<first character of previous command>
  e.g. **!C** to repeat the CC compile command

General Information

- Always create a new directory to place all downloaded files, move all files to this directory, and your working directory to it.
- Create new files using the text editor available from the graphical interface.
- To go to the line where there is a compiler error**,** in the editor window click on **options** in menu and select **status line**. To go a line, just type in the line number in the box and **enter**.
- Machines are available for your use in eb246, eb 216, and S122 in Tech Hall.