Installing IDE/COMPILER/EDITOR FOR C/C++

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Introduction

- C - powerful language yet small!!

Today we are going to learn:

- Some basics of programming
- How to install necessary tools to enable us run and learn the C language.

Programming: what is it?

- How do computers communicate?
- How can we communicate to computers?

Programming: what is it?

- The **<u>process</u>** of taking an **<u>algorithm</u>** and encoding it into a notation, so that it can be **<u>understood</u>** by a computer.

Programming: the how

- To translate the algorithm to a format understandable by the computer, programming languages provide:
  - Data types.
    - To represent data
  - Control constructs
    - How to use the data to acquire a solution

Programming: pseudocode?

A step by step set of instructions in your own language on what you want to do

Think about it as a simplified program that anyone can understand

Programming: pseudocode?

Think of an Example:

A program to input students grade after a test?

Programming: Communicating with a computer

Coding (or writing) the program ▶ **Compiling** ▶ **Linking** ▶ **Executing**

Programming: coding

- Involves writing a computer program with words and symbols that are understandable to human beings.
  - Or rather trained persons in the art!
- Involves typing the program directly into a window on the screen and save the resulting text as a separate file.
- The custom is that the text of a C program is stored in a file with the extension .c for C programming language
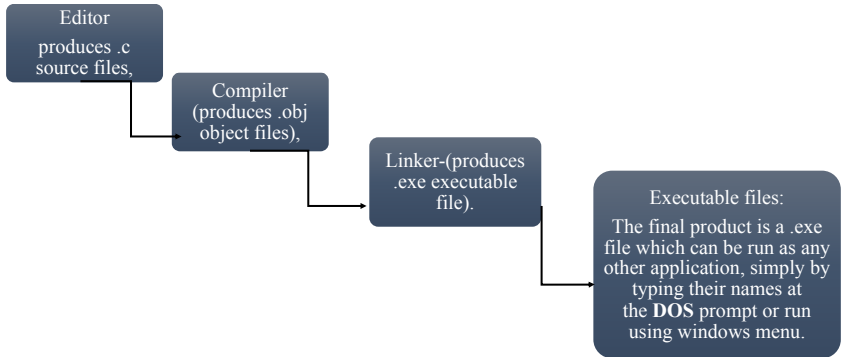 - .java for Java langugae
  - .py for python
  - .cpp for C++ etc

Programming: compiling

- The computer wont understand the source file!!
  - A process for translating this to a language understandable to computer is needed.
- To run on any computer system, the source file ;
  - MUST be translated into binary numbers understandable to the computer's Central Processing Unit (for example, the x86, x64 microprocessors etc).
  - This process produces an intermediate object file - with the extension .obj,
    - the .obj stands for Object.

Programming: Linking

- Many compiled languages come with library routines which can be added to your program.
  - Routines (programmed elements of code that carry out a specific task)
- Theses routines are written by the manufacturer of the compiler to perform a variety of tasks, from input/output to complicated mathematical functions.
- In the case of C the standard input and output functions are contained in a library (stdio.h) so even the most basic program will require a library function.
- After linking the file extension is .exe which are executable files.

Programming: Executable

Editor produces .c source files,

Compiler (produces .obj object files),

Linker-(produces .exe executable file).

Executable files:

The final product is a .exe file which can be run as any other application, simply by typing their names at the **DOS** prompt or run using windows menu.

The Roux Institute
at Northeastern University

Programming: What do we need?

- What do we need to program
  - Editor running in an OS
    - Such as Visual Studio, Emacs, notepad etc
  - A compiler
    - E.g. Visual studio has a Visual C++ compiler running on it.