C Programming I

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Outline

Introduction

What is the C Language?

- A general-purpose, procedural, imperative computer programming language.
- Developed in 1972 by Dennis M. Ritchie at the Bell Telephone Laboratories to develop the UNIX operating system.
- The UNIX operating system, the C compiler, and essentially all UNIX applications programs have been written in C.
- C is the most widely used computer language.
  - Easy to learn
  - Structured language
  - Produces efficient programs
  - Handles low-level activities
  - Can be compiled on a variety of computer plaforms
- Most of the state-of-the-art softwares have been implemented using C.
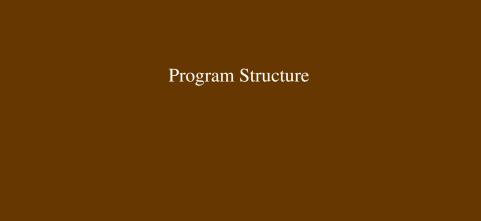- Today's most popular Linux OS and RBDMS MySQL have been written in C.

What do you need to learn C?

1. **C Compiler**
   - What is a Compiler?
     - A compiler is a computer program (or set of programs) that transforms source code written in a programming language (the source language) into another computer language (the target language, often having a binary form known as object code).
   - How does a compiler do?
     - Translate C source code into a binary executable
   - List of Common Compilers:
     - GCC GNU Project (Free, available on most *NIX systems)
     - Intel Compiler
     - Portland Group (PGI) Compiler
     - Microsoft Visual Studio
     - IBM XL Compiler

2. **Text Editor**
   - Emacs
   - VI/VIM
   - Notepad++ (avoid Notepad if you will eventually use a *NIX system)
   - Integrated Development Environment: Eclipse, XCode, Visual Studio, etc

Program Structure

Program Structure

A C Program consists of the following parts

- Preprocessor Commands
- Functions
- Variables
- Statements & Expressions
- Comments

A Simple Hello World Code

```c
#include <stdio.h>

int main ()
{
  /* My First C Code */
  printf("Hello World!\n");
  return 0;
}
```

Compile and execute the code

```
dyn100077:Exercise apacheco$ gcc hello.c
dyn100077:Exercise apacheco$ ./a.out
Hello World!
```

My First C Code

```c
#include <stdio.h>

int main ()
{
  /* My First C Code */
  printf("Hello World!\n");
  return 0;
}
```

- **#include** <stdio.h> is a preprocessor command.

  It tells a C compiler to include stdio.h file before going to actual compilation.
- **int** main() is the main function where program execution begins.
- /* ... */ is a comment and ignored by the compiler.
- printf(...) is function that prints Hello World! to the screen.
- **return** 0; terminates main() function and returns the value 0.

Title

Basic Syntax

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Data Types, Variables and Constants

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Control Structures: for, if & switch

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