



C Programming I

Alexander B. Pacheco
LTS Research Computing
April 28, 2015

Outline

- 1 Introduction
- 2 Basic Syntax
- 3 Program Structure
- 4 Data Types, Variables and Constants
- 5 Control Structures: for, if & switch

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 platforms
- Most of the state-of-the-art softwares have been implemented using C.
- Today's most popular Linux OS and RDBMS 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/Borland Compiler
 - IBM XL Compiler

2 Text Editor

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

My First C Code

- Simple Hello World Code

```
#include <stdio.h>

int main ()
{
    printf("Hello World!\n");
    return 0;
}
```

- Compile using GCC compiler or any other compiler that you prefer

```
dyn100077:Exercise apacheco$ gcc hello.c
```

- Run the compiled binary, a.out

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

Basic Syntax

Program Structure

Data Types, Variables and Constants

Control Structures: for, if & switch