

Course Notes Set 0:

COMP1200-001

Introduction to Computing for Engineers and Scientists C Programming

Computer Science and Software Engineering
Auburn University



Introduction

- What is programming?
- How will programming benefit you?
- What is C?
- Other programming languages.
- Various programming methods.
- C compilers
- Hello World

What is Programming?

- Programming can refer to several different things. For example, programming your VCR is a type of programming.
- In this class, we will deal with software programming. This type of programming involves using a programming language, such as C, to program a computer to perform tasks.

How will programming benefit you?

- Learning a programming language will provide you with skills that can be useful in business, science, etc.
- C/C++ is one of the most useful languages to know because of the demand for C/C++ programmers.
- C is a fundamental language that can be used as a building block to learning other languages.

What is C?

- The C programming language was developed at AT&T for the purpose of writing the operating system for the PDP-11 series of computers which ultimately became the UNIX operating system.
- C was developed with the primary goal of operating efficiency.
- Bjarne Stroustrup, also of AT&T, developed C++ in order to add object oriented constructs to the C language.

Other programming languages

Some other popular programming languages are:

- C++ - which is an extension of C.
- Basic or Visual Basic by Microsoft.
- Ada
- Pascal
- COBOL
- Java

Various programming methods

Programming methods can be described as one of the following:

- Structural or Procedural
 - Makes use of procedures and usually has a continuous flow.
- Object-Oriented
 - Utilizes classes, methods, and members, which all will be discussed later.
- Agent-Based
 - Extends Object-Oriented Programming by giving objects autonomy, in most cases.

In this class, we will focus on Structural/Procedural programming methods



C Compilers

Below is a list of some of the more popular C compilers:

- CYGWIN
- UNIX C compiler.
- GNU, which is a UNIX based compiler.
- Microsoft Visual C++, which is Windows based.

In this class, you can use CYGWIN or Microsoft

Visual C++. CYGWIN will be used to grade your assignments.

Hello World - 1st C program

```
/* First program in C, helloworld.c */  
  
#include <stdio.h>  
  
int main()  
{  
  
    printf("Hello World\n");  
  
    return 0;  
  
}
```

Hello World - 1st C program

Line By Line Analysis

```
/* First program in C, helloworld.c*/
```

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
    printf("Hello World\n");
```

```
}
```



**Comment line,
comment appears
between /* and */.**

Hello World - 1st C program

Line By Line Analysis

```
/* First program in C, helloworld.c */
```

```
#include <stdio.h>
```

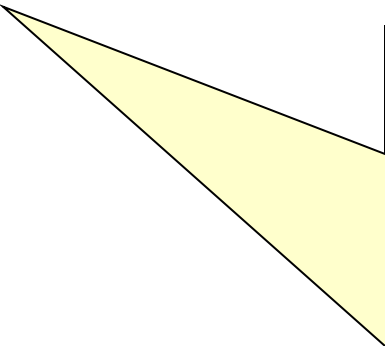
```
int main()
```

```
{
```

```
    printf("Hello World\n");
```

```
    return 0;
```

```
}
```



Lines that are preceded with a pound sign are **preprocessor directives**.

In other words, these lines make the contents of the **stdio.h** header file available for use within the helloworld.c program.

Hello World - 1st C program

Line By Line Analysis

```
/* First program in C, helloworld.c */
```

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    printf("Hello World\n");
```

```
    return 0;
```

```
}
```

This line is part of every C program. The parentheses after **main** indicate that **main** is a function, which will be defined later. The curly bracket, { indicates the beginning of the **main** function. The keyword **int** to the left of **main** indicates that **main** has a return value, we will discuss this in further detail later.

Hello World - 1st C program

Line By Line Analysis

```
/* First program in C, helloworld.c */
```

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    printf("Hello World\n");
```

```
    return 0;
```

```
}
```

This line prints the message **"Hello World"** followed by a newline feed, which is designated by the **\n**. The **printf** function comes from the **stdio.h** header file. **stdio** prints the text to the screen, which is also called **standard output**. Notice that the line is terminated with a semicolon, **;**. Lines of code in C are terminated by a semicolon.

Hello World - 1st C program

Line By Line Analysis

```
/* First program in C, helloworld.c */
```

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    printf("Hello World\n");
```

```
    return 0;
```

```
}
```

The closing curly bracket, **}** designates the end of the **int main()** function. Curly brackets come in pairs. There is always an opening bracket, **{**, later matched by a closing curly bracket, **}**.

Hello World - 1st C program Output

Hello world