***Chapter 1: Variables, Constants, and Keywords:***

**Variables**

A variable is a container that stores a ‘value.’ In the kitchen, we have containers storing rice, dal, sugar, etc. Similar to that variable in c stores the value of a constant. Example:

|  |  |
| --- | --- |
| a = 3 | a is assigned “3” |
| b = 4.7 | b is assigned “4.7” |
| c = 'A' | c is assigned “A” |

**Rules for naming variables in c:**

1. The first character must be an alphabet or underscore(\_).

2. No commas or blanks are allowed.

3. No special symbol other than underscore is allowed

4. Variable names are case sensitive

**Constants**

An entity whose value doesn’t change is called a constant.

**Types of constant**

Primarily there are 3 types of constant:

|  |  |
| --- | --- |
| 1. Integer Constant | -1,6,7,9 |
| 2. Real Constant | -322.1,2.5,7.0 |
| 3. Character Constant | ‘a’,’$’,’@’(must be enclosed within single inverted commas) |

**Keywords**

These are reserved words whose meaning is already known to the compiler. There are 32 keywords available in c:

|  |  |  |  |
| --- | --- | --- | --- |
| auto | double | int | struct |
| break | long | else | switch |
| case | return | enum | typedef |
| char | register | extern | union |
| const | short | float | unsigned |
| continue | signed | for | void |
| default | sizeof | goto | volatile |
| do | static | if | while |

**Our first C program**

#include<stdio.h>

int main() {

printf(“Hello, I am learning C with Harry”);

return 0;

}

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***File :  first.c***

**The basic structure of a C program**

All c programs have to follow a basic structure. A c program starts with the main function and executes instructions presents inside it. Each instruction terminated with a semicolon (;)

There are some basic rules which are applicable to all the c programs:

1. Every program's execution starts from the main function.
2. All the statements are terminated with a semi-colon.
3. Instructions are case-sensitive.
4. Instructions are executed in the same order in which they are written.

**Comments**

Comments are used to clarify something about the program in plain language. It is a way for us to add notes to our program. There are two types of comments in c:

1. Single line comment: //This is a comment.
2. Multi-line comment : /\*This is multi-line comment\*/

Comments in a C program are not executed and ignored.

**Compilation and execution**



A compiler is a computer program that converts a c program into machine language so that it can be easily understood by the computer.

A program is written in plain text. This plain text is a combination of instructions in a particular sequence. The compiler performs some basic checks and finally converts the program into an executable.

**Library functions**

C language has a lot of valuable library functions which is used to carry out a certain task; for instance, printf function is used to print values on the screen.

printf(“This is %d”,i);

// %d for integers

// %f for real values

// %c for characters

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**Types of variables**

|  |  |
| --- | --- |
| Integer variables | int a=3; |
| Real variables | int a=7.7 (wrong as 7.7 is real) ; float a=7.7; |
| Character variables | char a=’B’; |

**Receiving input from the user**

In order to take input from the user and assign it to a variable, we use scanf function.

The syntax for using scanf:

scanf(“%d”,&i); // [This & is important]

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& is the “address of” operator, and it means that the supplied value should be copied to the address which is indicated by variable i.

Chapter 1: Practice Set:

**Q1**. Write a c program to calculate the area of a rectangle:

a) using hardcoded inputs &

b) using inputs supplied by the user

**Q2.**Calculate the area of a circle and modify the same program to calculate the volume of a cylinder given its radius and height.

**Q3.**Write a program to convert Celsius (Centigrade degrees temperature to Fahrenheit)

**Q4.**Write a program to calculate simple interest for a set of values representing principle, no of years, and rate of interest.