CHAPTER 1 : Variables, Constants & Keywords

(*) **Variables :-**

A Variable is a container which stores a 'value'. In Kitchen we have containers storing Rice, Dal, Sugar etc. Similar to that, Variable in C stores 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 a Variable in C

(1) First character must be an alphabet or underscore (_)
(3) No Special Symbol other than (_) allowed
(2) No Commas, blanks are allowed
(4) Variable names are Case Sensitive
(mohit and Mohit is different)

(*) we must create meaningful variables names in the programs. This Enhance readability of our programs.

Constants

An Entity whose value does not change is called a Constant
A Variable is an Entity whose value can be changed.

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Types of Constants

Primarily, there are three types of Constants:-

(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 quotes)

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("Hellooo, I am learning C with Mohit");
return 0;
}
```

Basic Structure of a C program

All C programs have to follow a basic structure
A C program starts with a main function and
Executes instructions present inside it.
Each instruction is terminated with a
Semicolon (;)

There are some rules which are applicable
to all the C programs:

(1) Every program's Execution starts from main()
function.
(2) All the statements are terminated with a
Semicolon
(3) Instructions are Case-Sensitive
(4) Instructions are executed in the same order
in which they are written

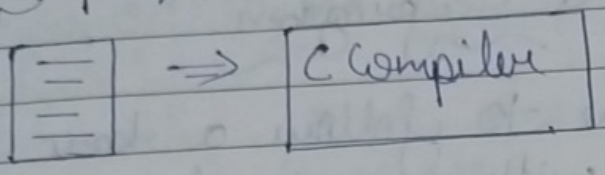
Comments

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 a multi line
Comment */

Comments in a C program are not Executed
and are ignored.

Compilation and Execution



A Compiler is a computer program which converts a C program into machine language so that it can be easily understood by the computer.

A C program is written in plain text. this plain text is 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 certain tasks for instance print function is used to print values on the screen

```
printf("This is %d", i);
```

%d for integers
%f for real values
%c for character

Types of Variables

(1) Integer Variables → int a = 3;
(2) Real variables → float a = 7.7;
(3) 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

(*) Syntax for Using Scanf:

```
Scanf ("%d", &i);
```

↳ This & is important!

& 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 area of a rectangle :- (Take inputs from user)

⇒

```
#include <stdio.h>

int main() {
    int length;
    printf("Enter the value of length");
    Scanf("%f", &length);

    int breadth
    printf("Enter the value of breadth");
    Scanf("%f", &breadth);

printf("The area of the rectangle is %f", length*breadth);
return 0;
}
```

Q2) Calculate the area of a Circle and Modify the same program to calculate the volume of a Cylinder given its radius and height;

⇒ 1st for Circle

```
#include <stdio.h>

int main(){
int radius;
printf("Enter the value of radius")
Scanf("%f", &radius);

printf("The area of the Circle of radius %f is
        %f", radius, 3.14*radius*radius)
return 0; }
```

2nd for the Cylinder

we have to add one more variable named as height we can ask values from the user or we can give hard inputs like int height = 5; and in the printf we have to change the statement and values accordingly.

Q3) Write a program to convert Celcius (Centigrade degrees temperature to Farenheit)

```
#include <stdio.h>
int main() {
    int celcius;
    printf("Enter temperature in Celsius: ");
    scanf("%d", &celcius);

    printf("Temperature in Fahrenheit: %.2f\n",
                    ((celcius * 9.0/5.0) + 32));
    return 0;
}
```

Q4⇒ Write a program to calculate simple intrest for a set of values representing principal no of years and rate of intrest;

```
#include <stdio.h>
int main() {
    float principal;
    float rate;
    float time;

printf("Enter the principal amount: ");
scanf("%f", &principal);

printf("Enter the rate: ")
scanf("%f", &rate);

printf("Enter the time in years: ")
scanf("%f", &time);

printf("The Simple intrest is: %f\n", (Principal*
    return 0;                          rate*time
```