C-PROGRAMMING NOTES

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Variables and data types

Variables :

- Variables are used to store the value during the execution of a program.
- The name itself means, the value of variable can be changed. But the data type associated with the variable cannot be changed.
- The variables are stored in Main Memory i.e. RAM
- In C-programming, we always have to declare variable before using them.

Data Types :

- C supports several different types of data , each of which may be represented differently within computer's memory.

- The basic data types are listed below:

DATA TYPES	DESCRIPTION
Int	- Integer quantity - %d
Char	- Single character - %c
Float	- Floating point number(i.e.,number containing a decimal point and/or an exponent) - %f,%e
Double	- Double-precision floationg point number(i.e.,more significant figures,and an exponent which may be larger in magnitude)

Variable Decleration :

- A decleration associates a group of variables with a specific data type.All variables must be declared before they can appear in executable statements.

- A decleration consists of a data type,followed by one or more variable names,ending with a semicolon.
- EXAMPLE: int a,b,c;
  Float root1,root2,root3;
- Initial values can be assigned to variables within a type decleration.Example: int c=12;

Constant :

There are four basic types of constants in C :

1. Integer constant,
2. Floating-point constant,
3. Character constant,
4. String constant.

Operators :

- The data items that operators act upon are called operands.

- There are five arithmetic operators in C. They are:

Operators	Purpose
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulus

ELEMENTARY PROGRAMMING :

Printf function :

- Printf function is defined in <stdio.h> header file.
- Syntax: print(“message prompt”;data type);
- Use : It writes the arguments which are written in the double inverted quotes.

Newline Character :

- It is use to represent the end of a line of text and the beginning of a new line.
- It is represented as “\n”.

Use of semicolon :

- It is a statement terminator that helps the parser figure out where statements ends and it is must after completion of every statement.

Use of Curly Brackets :

- Curly brackets are used to start and end every block of program.
- All the instruction written within these curly brackets are part of main and are executed one by one from top to bottom.

Use of comments in a program :

- Comments provide clarity to the C source code allowing others to better understand what the code was intended to accomplish and greatly helping in debugging the code.
- Examples :
  Multi-line comment : /*……..*/
  Single line comment : //……..

Rules for naming a variable :

1. The 1st letter should be alphabet.
2. Varaibles can be combination of alphabets and digits.
3. Underscore (_) is the only special character allowed.
4. Variables can be written in both uppercase and lowercase or combination of both.
5. Variables are case-sensative.
6. No space allowed between characters.
7. Variable name should not make use to the C Reserved Keywords.
8. Variable names should not start with a number.

Assignment statement :

- Syntax :
  Variable=constant/variable/expression;
- The function of the statement is to assign the values or value in variables on right hand side of an expression to variables on the left hand side.

Truncation effect on integer dividion :

- Truncation means limiting the number of digits right of the decimal point.

- In C,when two integers are divided,the result is truncated.That is,when the computer calculate 23/4 instead of getting 5.75,it gets 5.This is called truncation of integer division.

Modulo Operator :

- Because of the complexity created by truncation effect of integer division,the language provides in-built nechanism called the **Modulus Operator.**
- It is represented by %.
- It computes the remainder that results from performing integer division.

Unary Operator :

- C includes a class of operators that act upon a single operand to produce a new value.Such operators are known as unary operators.

- I=i+1 is similar to i++.

Scientific Notation :

- e=10^ i.e., 10^5=e5

Floating Point Number :

- Conversion specifier are %f and %e
- It has two parts:fractional part(mantisa) and exponent part.
- Floating point operations are slower and occupy more memory than integer operation.
- Floating point operations are not exact.

Double Type :

- It has better accuracy than float.
- Usually,float variables have seven digits,but double has 16 or 17 digits.
- It is the default type for fractional numbers.