Data Types

The term Data type defines as the type of value that a variable can store. We find two types of data types and they are
1) simple or fundamental data type
2) complex or derived data type
The simple data type include int, float, char, double and void it is used to represent integer, floating point, long floating point and character
Derived data types are constructed by using simple data types. They are further classified as linear and non linear data structure.
In linear data structure data elements are arranged in sequential manner. The C++ contain arrays, structures, union, pointer, linked list
In non linear the data elements are arranged in non-sequential manner. It contain user defined data types
Simple or fundamental data type
int: The data type int are whole number without any fractional value with the range of value lies between -32768 to 32767. The **int** data type requires 2 bytes of memory location to store the value**. Ex: 6,8**
float :These are numbers with fractional part. The real number ranges from -3.4e-38 to 3.4e38 where e represent exponent. It requires 4 bytes of memory location **Ex: 2.6, -9.7**
char: This is used to store the single letter. The character value is always represented within side of single quote. To occupy this value we require one byte of memory
Ex: 'A' , 'd'
double: This is float with double precision The range of we can store from -1.7e-308 to 1.7e308. To store this type of value we require eight byte of memory location.
Ex: 3.142e10
Modifiers: Modifiers are used to alter the meaning of the basic data types
short int represents small integer value and it requires two byte of memory location to store the value. It can store the value ranging from -32768 to 32767
The **long int** represent longer than int. long int requires 4 bytes of memory to store the value.
The **unsigned int** unsigned integer are always represent positive number ranging from 0 to 65535. Two store these value we require two byte
Derived data type: These data types are constructed using simple data types. It includes arrays, functions, pointers and references
User defined data types: These data types are also constructed using simple data types
Enumerated data types
This is user defined data type we can use this when we know in advance the finite number of values a variable can take in a program. To declare this type of data type we require the key word enum. These data types are internally related as integers. The first member will get the value 0 and next 1 and so on. The changes can be done by assigning the values to member at the declaration time.
Example:

```
#include<iostream.h>
enum days { sun, mon, tue, wed, thu ,fry, sat};
```

```
void main()
{
cout<<" The value of Sunday is ="<<sun;
}
```

we get the output as

The value of Sunday is =0

Variables: A variable is an object or element and it is allowed change during the execution of the program. It represent the name of the memory location

Declaration of a variable: In the declaration section we have to declare the variable in generally the variable is declared before its use with following syntax

Data-type variablename1, variablename2;

Example: int m, n;

The declaration does the 2 significant task like it tells the compiler about the name of the variable and specifies the type of the data that a variable can store

Initializing a variable

Data-type variablename1=value;

Ex: float pi=3.142;

NOTE

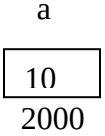
1) There are two values are associated with a variable known as lvalue and rvalue

2) The lvalue is the location value. It holds the memory address location at which the data value is stored.

3) rvalue is the data value. It holds the assigned to the variable by the programmer

Example: a=10;

Then it store in the memory as follows



Name of the variable a, rvalue is 10 and lvalue is 2000