



- **Subject Name:-** Computer science
- **Topic Name:-** Data type in c lang
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DATA TYPES

- Data types are used to define a variable before it can be used in a program.
- C data types are defined as the data storage format that a variable can store a data to perform a specific operation.

Data

Types

- Data Types is further divided into 3 parts.
 1. Primitive
 2. Derived
 3. User Defined

Data types

Primitive

char

int

float

double

void

Derived

Array

pointer

function

User defined

enum

structure

union

Ranges of Data Types

Data Type	Range	Bytes	Format
signed char	-128 to +127	1	%c
unsigned char	0 to 255	1	%c
short signed int	-32768 to +32767	2	%d
short unsigned int	0 to 65535	2	%u
signed int	-32768 to +32767	2	%d
unsigned int	0 to 65535	2	%u
long signed int	-2147483648 to +2147483647	4	%ld
long unsigned int	0 to 4294967295	4	%lu
float	-3.4e38 to +3.4e38	4	%f
double	-1.7e308 to +1.7e308	8	%lf
long double	-1.7e4932 to +1.7e4932	10	%Lf

Integer Data

Type

- Integer data type allows a variable to store numeric values.
- “int” keyword is used to refer integer data type.
- The storage size of int data type is 2 bytes.
- int (2 byte) can store values from -32,768 to +32,767
- If you want to use the integer value that crosses the above limit, you can go for “long int” for which the limits are very high.

General Syntax to declare int

```
void main()  
{  
int a,b; // Here we have declared 2 integers  
}
```

Each 'a' and 'b' will take 2 bytes each so 4 bytes will be stored in the memory

Character

- ❑ Character data type allows a variable to store only one character.
- ❑ Storage size of character data type is 1. We can store only one character using character data type.
- ❑ “char” keyword is used to refer character data type. Character takes only 1 byte and has a range from -128 to 127.
- ❑ For example, ‘A’ can be stored using char datatype. You can’t store more than one character using char data type.

General Syntax to declare Character

```
void main()
{
char a,b; // Here we have declared 2
          characters
}
```

Each 'a' and 'b' will take 1 byte each so 2 bytes will be stored in the memory

Float Data

Type

- Float data type allows a variable to store decimal values.
- Storage size of float data type is 4.
- We can use up-to 6 digits after decimal using float data type.
- For example, 10.456789 can be stored in a variable using float data type.
- Range of Float is $-3.4e38$ to $+3.4e38$

General Syntax to declare Float

```
void main()
{
float a,b;    // Here we have declared 2 float
              variables
}
```

Each 'a' and 'b' will take 4 bytes each so 8 bytes will be stored in the memory

Double Data type

- Double data type is also same as float data type which allows up-to 10 digits after decimal.
- The range for double datatype is from $1E-37$ to $1E+37$.
- It takes double the memory space as float. It takes 8 bytes.

General Syntax to declare Float

```
void main()  
{  
double a,b; // Here we have declared 2 double  
            variables  
}
```

Each 'a' and 'b' will take 8 bytes each so 16 bytes will be stored in the memory

Void Data

Type

- Void is an empty data type that has no value.
- This can be used in functions and pointers.

□ General Syntax

```
void main()
```

```
{
```

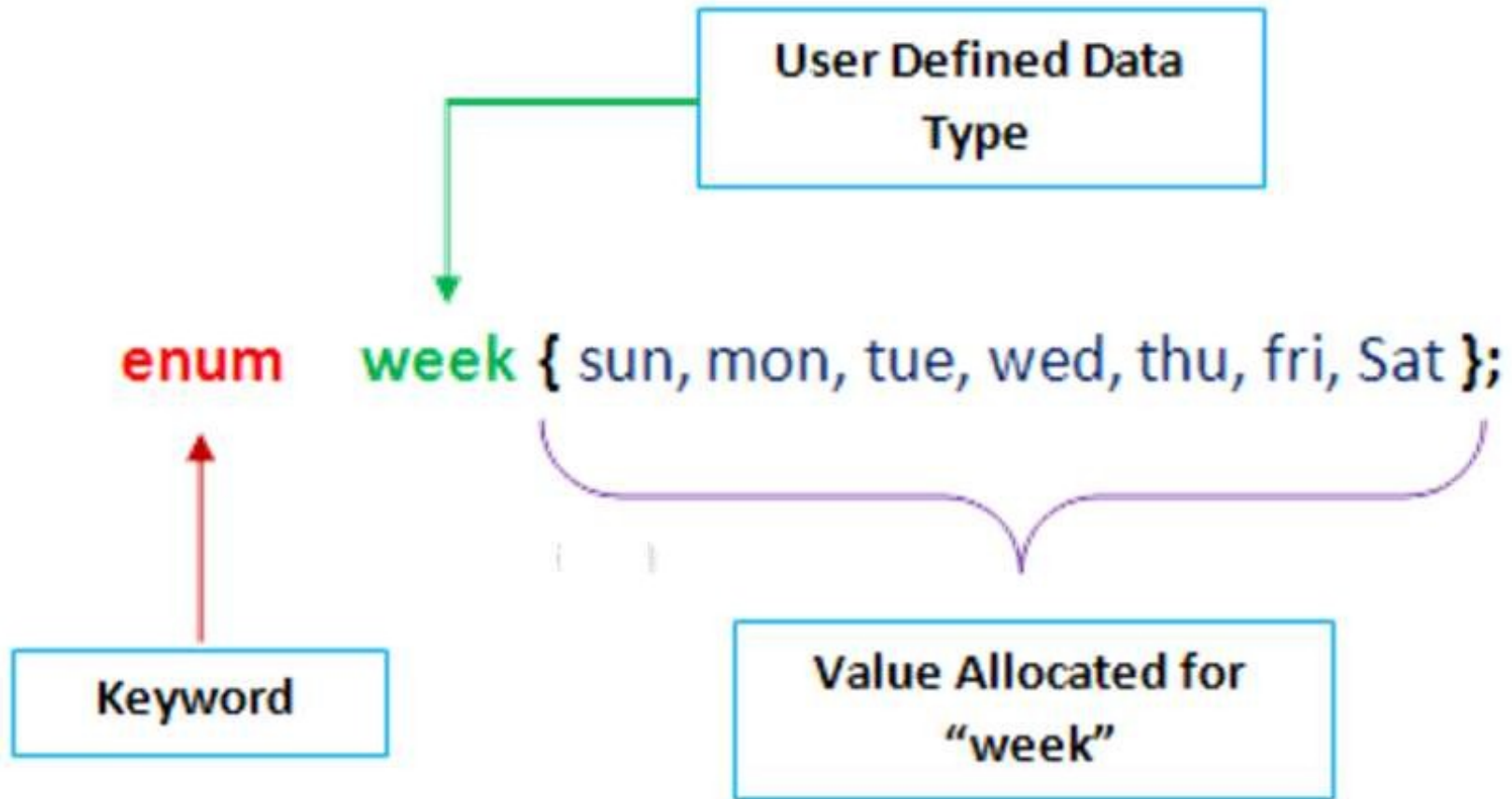
```
}
```

Enum

- An **enum** is a keyword, it is an user defined data type. All properties of integer are applied on Enumeration data type so size of the enumerator data type is 2 byte. It work like the Integer.
- It is used for creating an user defined data type of integer. Using enum we can create sequence of integer constant value.

Syntax of enum

- **enum** tagname {value1, value2, value3,.....};
- In above syntax **enum** is a keyword. It is a user defined data type.
- In above syntax tagname is our own variable. tagname is any variable name.
- value1, value2, value3,..... are create set of enum values.



It is start with 0 (zero) by default and value is incremented by 1 for the sequential identifiers in the list. If constant one value is not initialized then by default sequence will be start from zero and next to generated value should be previous constant value one.

Program of Enum

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a;
    enum ABC
    {x,y,z}; clrscr();
    a=x+y+z;
    printf("Sum: %d",a);
    getch();
}
```

Enum

```
#include <stdio.h>
#include <conio.h>
void main()
{

    int today;
    enum week{ sun,mon,tue,wed,thu,fri,sat};
    clrscr();
    today = wed;
    printf("Day %d",today+1);
getch();
}
```