Variables(with DataTypes and space requirements)

UNIT-1

Basics:

In programming, a variable is a container (storage area) to hold data.

To indicate the storage area, each variable should be given a unique name (identifier).

Variable names are just the symbolic representation of a memory location

Example:
```
int playerScore = 95;
```

Rules for Naming Variable

1. A variable name can only have letters (both uppercase and lowercase letters), digits and underscore.
2. The first letter of a variable should be either a letter or an underscore.
3. There is no rule on how long a variable name (identifier) can be. However, you may run into problems in some compilers if the variable name is longer than 31 characters.

Syntax

type variable_list;

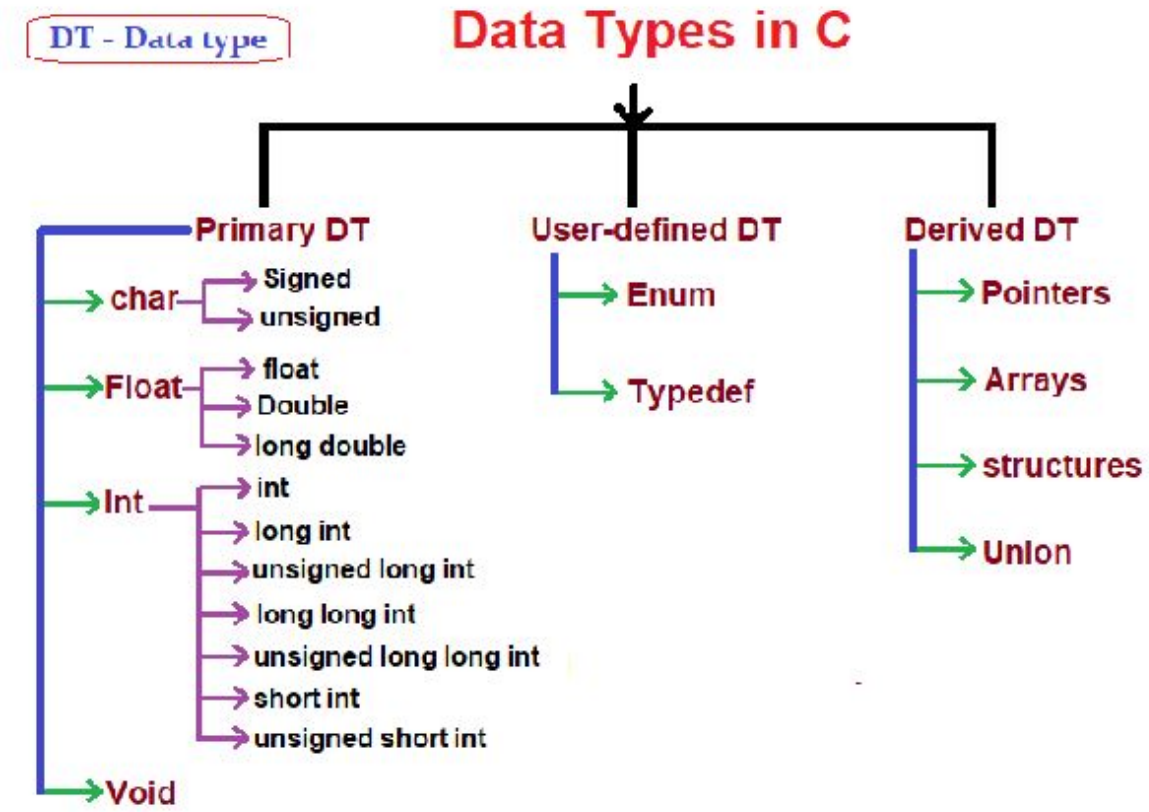
```
int     i, j, k;
char    c, ch;
float   f, salary;
double d;
```

Syntax 2:

type variable_name = value;

```
extern int d = 3, f = 5;     // declaration of d and f.
int d = 3, f = 5; // definition and initializing d and f.
byte z = 22;         // definition and initializes z.
char x = 'x';     // the variable x has the value 'x'.
```

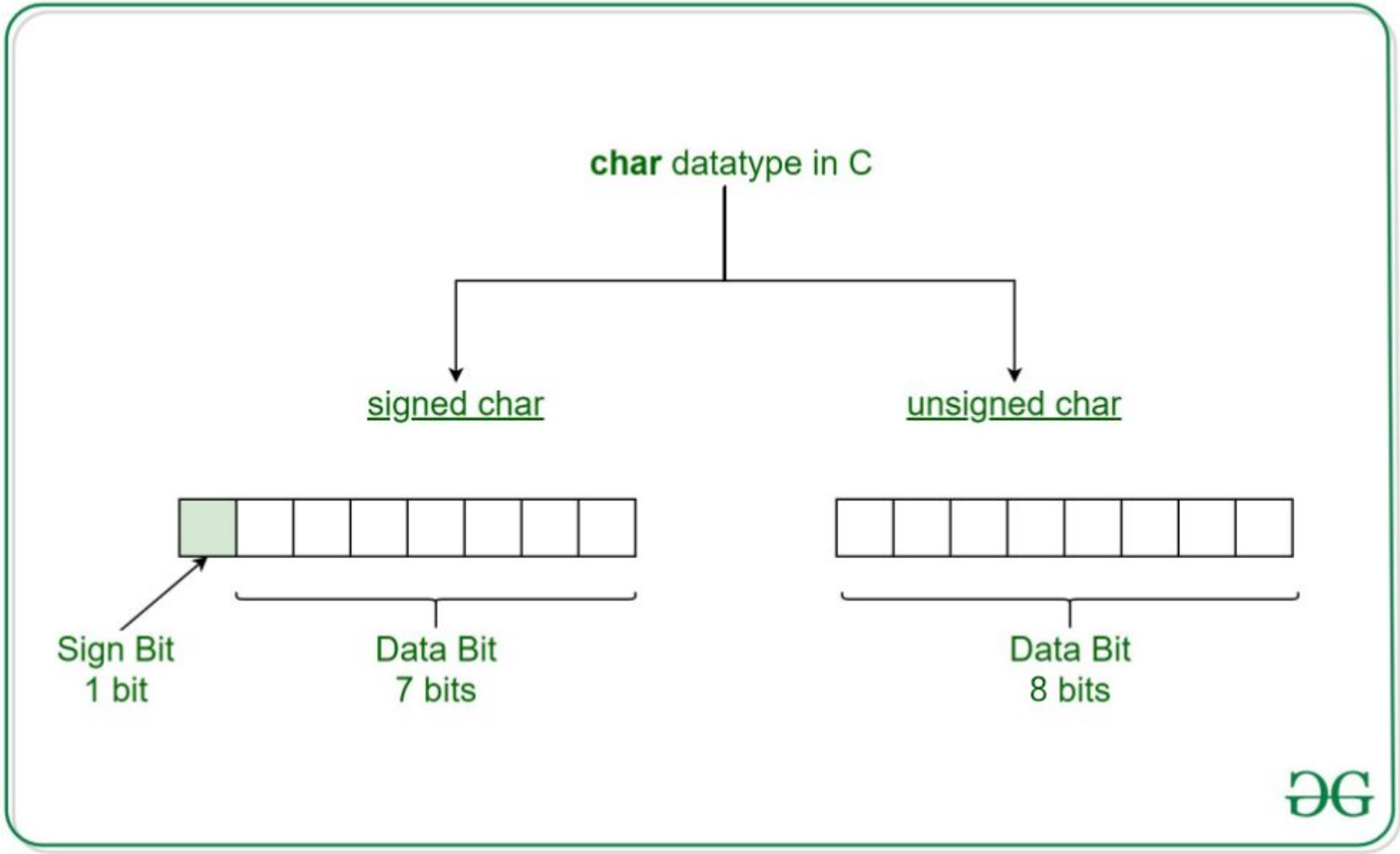
Data Types:


DT - Data type
Data Types in C
Primary DT
User-defined DT
Derived DT
char
Signed
unsigned
Float
float
Double
long double
Int
int
long int
unsigned long int
long long int
unsigned long long int
short int
unsigned short int
Void
Enum
Typedef
Pointers
Arrays
structures
Union

Data Type Sizes and Ranges

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

Note: The sizes and ranges of int, short and long are compiler dependent. Sizes in this figure are for 16-bit compiler.


char datatype in C
signed char
unsigned char
Sign Bit
1 bit
Data Bit
7 bits
Data Bit
8 bits

Enumeration (or enum) is a user defined data type in C. It is mainly used to assign names to integral constants, the names make a program easy to read and maintain.

```
// An example program to demonstrate working

// of enum in C

#include<stdio.h>



enum week{Mon, Tue, Wed, Thur, Fri, Sat, Sun};



int main()

{

    enum week day;
```