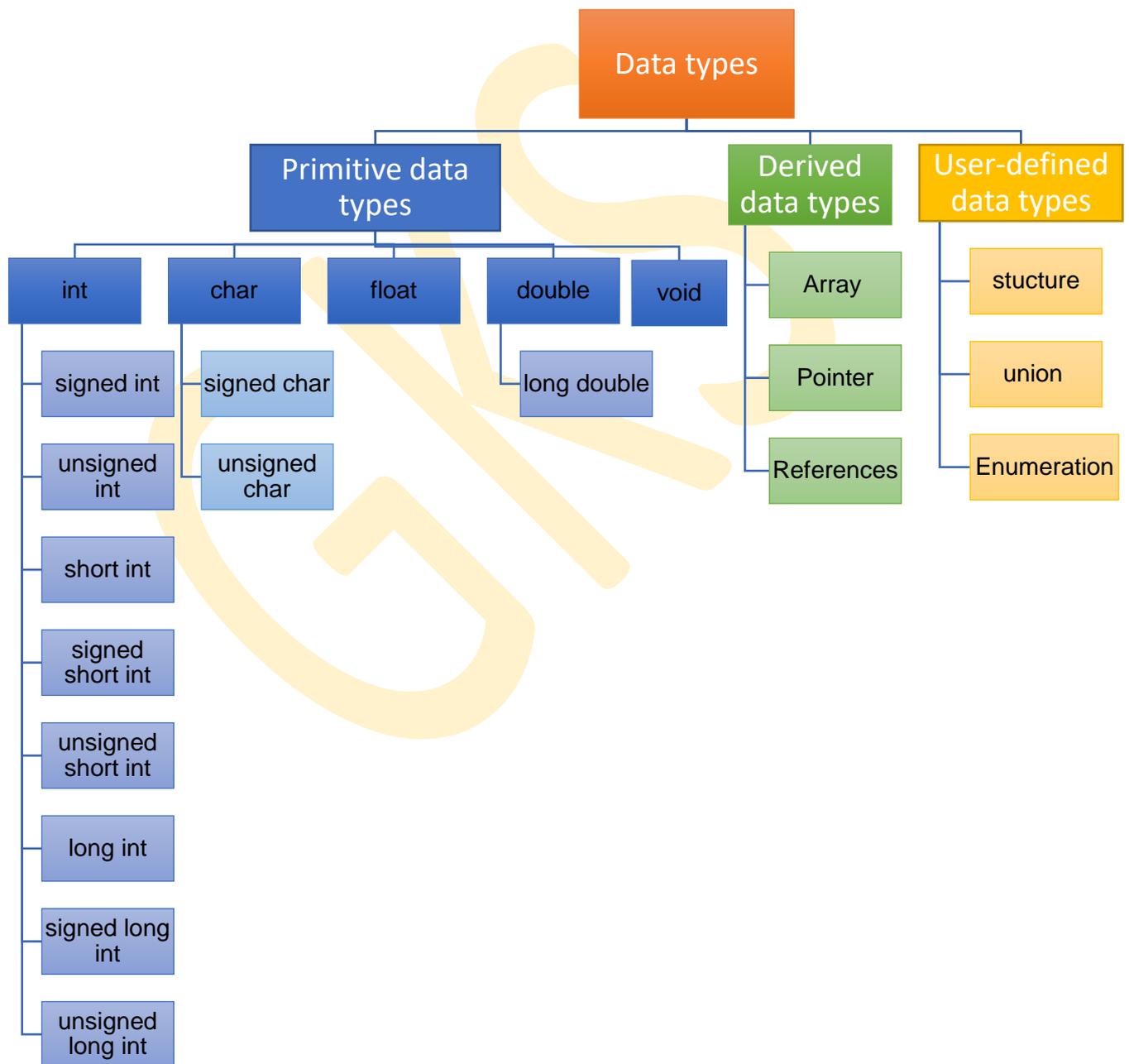# Data type in C

Data Type in C

A data type specifies the type of data that a variable can store such as integer, floating, character, etc.

Data types specify how we enter data into our programs and what type of data we enter. C language has some predefined set of data types to handle various kinds of data that we can use in our program. These datatypes have different storage capacities.

Primitive data types

Integer type (int)

Integers are used to store whole numbers.

Size and range of Integer type on 16-bit machine:

Type	Size(bytes)	Range
int or signed int	2	-32,768 to 32767
unsigned int	2	0 to 65535
short int or signed short int	1	-128 to 127
unsigned short int	1	0 to 255
long int or signed long int	4	-2,147,483,648 to 2,147,483,647
unsigned long int	4	0 to 4,294,967,295

Floating point type

Floating types are used to store real numbers.

Size and range of Integer type on 16-bit machine

Type	Size(bytes)	Range
Float	4	3.4E-38 to 3.4E+38
double	8	1.7E-308 to 1.7E+308

Type	Size(bytes)	Range
long double	10	3.4E-4932 to 1.1E+4932

Character type

Character types are used to store characters value.

Size and range of Integer type on 16-bit machine

Type	Size(bytes)	Range
char or signed char	1	-128 to 127
unsigned char	1	0 to 255

void type

void type means no value. This is usually used to specify the type of functions which returns nothing. We will get acquainted to this datatype as we start learning more advanced topics in C language, like functions, pointers etc.

Derived data types

Array

Arrays are sequences of data items having homogeneous values. They have adjacent memory locations to store. Array in C stores multiple values of the same data type. That means we can have an array of integers, chars, floats, doubles etc…

Pointers

Pointers are considered by many to be complex in C, but that is not the case. Simply put, a pointer is just a variable that stores the address of another variable. A pointer can store the address of variables of any data types.

User-defined data types

Structs

Struct is a composite structure that can contain variables of different data types. For example, all the student data that we declared earlier in basic data types can be put under one structure. Instead of having the information scattered, when we give it a structure, it is easier to store information about more students.

Union

With union, you can store different data types in the same memory location. Union can have many members, but only one member can have a value at one time. Union, is thus, a special kind of data type in C.

Enumeration

Enumeration data types enhance the readability of the code. If you have integer constants in the code that can be reused or clubbed together, we can use enums to define the constants.