Basic Structure Of C Programming:

```c
/*Write a program to print Hello World!*/
#include<stdio.h> //header file
int main()//main function
{
    printf("Hello world!");//print statement
}
```

Line-1: It is the multi-line comment statement.

Line-2: #include<stdio.h> is the header file

This is the common and most important header file we use in C programming. In a header file there are multiple predefine functions are available and using those predefine function we can give some specific task to the system for operation.

#include<stdio.h> in here stdio.h define standard input and output. # - preprocessor

stdio.h – standard input output with (.h) extension. (.h) is extension of header file. for printf and scanf we use this header file. and those 2 functions are defined in that header file.

#include<conio.h> is for the console input output. if you use getch() function in program. it is basically to hold the screen output. #include<string.h> for string operation.

#define pi 3.14 this is a macro definition section where you define a value. if you define this in starting of the program then you can use pi in anywhere of the source code.

Line-3: main function() in a program there is only one main function. Here we use int main() it means the main() returns a integer data at the end of the execution. sometime we use void main() which will not return any type of value at the end of the execution.

Line-5: printf() is for print a line in output section.

Line-4, 6: { } these brackets are for opening and closing of the source code.

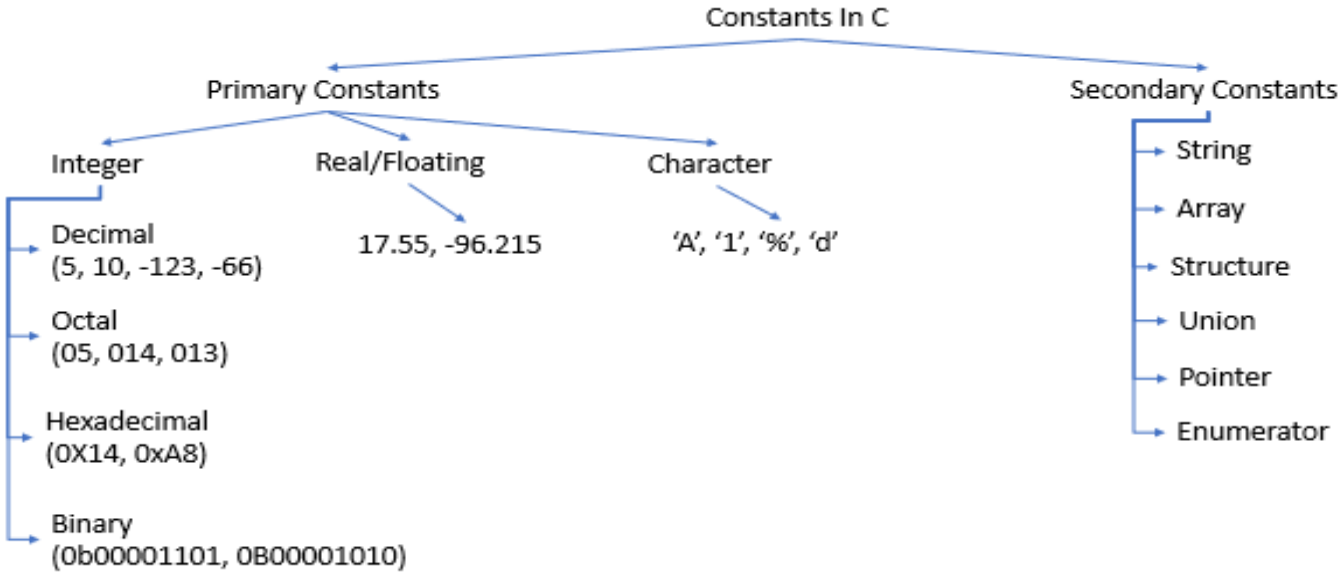
Token In C Programming:

Token is the smallest building block of the program. in token these are some of the elements which plays an important role in programming. Example: Constants, Variables, Keywords, Operators, Functions, Identifier, Special Character, etc.

There are two types of statements are there in programming languages "Declaration Statement" & "Action Statement."

Constant In C Programming:

In C programming language constants are having fixed value, the values of constants are not going to be changed during the execution of program. The hierarchy of Constants in C is as follows:



Keywords In C Programming:

Keywords are the predefine words or the reserve words. A set of words those are the predefined within the header-file/package, and those can be used to perform some specific task, are called as keyword. There are 44 keywords are there in C language.

auto	double	int	struct	_Bool
break	else	long	switch	_Complex
case	enum	register	typedef	_Imaginary
char	extern	return	union	inline
const	float	short	unsigned	restrict
continue	for	signed	void	_Alignas
default	goto	sizeof	volatile	_Alignof
do	if	static	while	_Atomic
_generic		_Static_assert		_Thread_local

ASCII stands for American Standard Code for Information Interchange.

Variable In C Programming:

Rules For Variable Declaration:

1 Variable must be any combination of Alphabet, Numeric Digit & Underscore(_).

2 No other symbols are allowed in variable declaration

3 Valid variable name can't start with Numeric digits.

4 In Variable declaration keywords are not use as a variable name.

5 Variable are case sensitive it means A & a both are different.

6 The identifier should not contain any blank space.

7 The max length of an identifier can be 37.

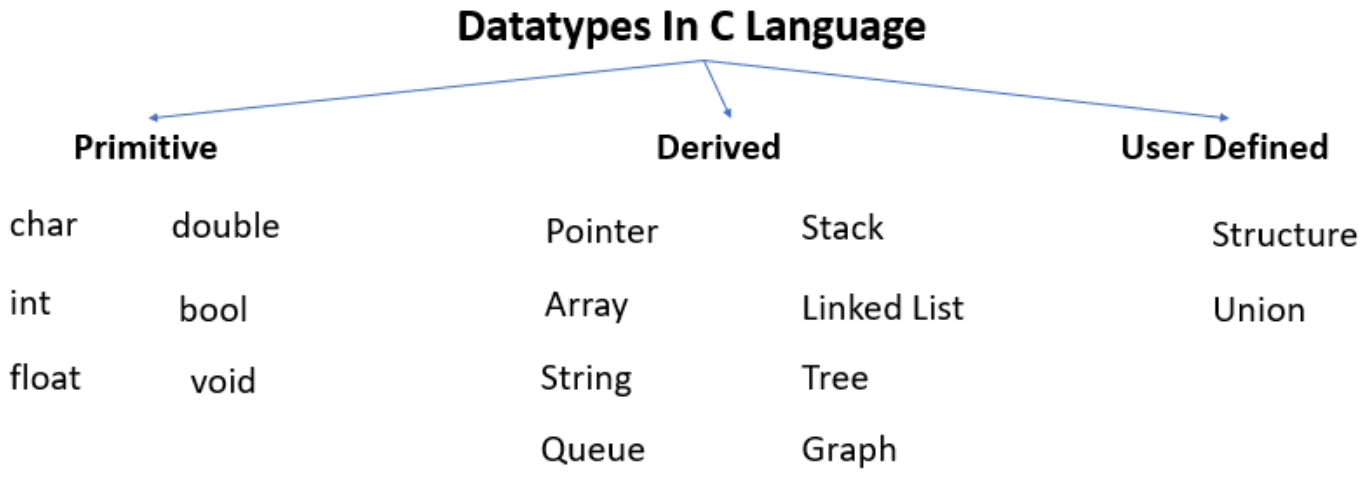
Datatypes & Variable Declaration In C Programming:

Data types defines categorization of data as per the real life problem solving requirements. It indicates type of value to be stored and memory requirement of the variable. We categorize data by analyzing 3 perspectives

1. Memory size required to store data. 2. internal binary representation

3. kind of operations.

Datatypes Hierarchy In C Programming:



Primitive Datatypes:

In this type of datatype the variable can hold only one value.

Derived Datatypes:

In this type of datatype the variable can hold multiple value but values are must be homogeneous type.

User Define datatypes:

in this type of datatype the variable can hold multiple value but values are must be heterogeneous type.

Variable Declaration In C Programming:

```
int A = 10;
```

"int" = datatype
"A" = Variable Name
"=" -> Assignment Operator
10 = Value stored in variable "A"
; = it means the end of the statement in programming language

Garbage Value In C Programming:

It defines if you create a variable and you don't assign any value to that specific variable then in that variable a random value will assigned by the programming language and that value is known as garbage value.

Block Structure In C Programming:

1. C programming language is a block structure programming language.

2. A block is a group of instructions.

3. Outer blocks are usually functions.

4. Function is a block of statements which has some name for identification.

5. In C programming language there have any number of blocks.

6. Even in the smallest C program there is at least one function and that is main() function.

7. If there is only one function in the program then its name must be main() function.

8. You can write declaration statement outside the function body but action statement must be written inside the function body.

Datatype Table In C Programming:

Datatype	Memory In bytes	Range	Format Specifier
short	2	-32,768 – to – 32,767	%hd
unsigned short int	2	0 – to – 65,535	%hu
Int	4	-2,147,483,648 – to – 2,147,483,647	%d
unsigned int	4	0 – to – 4,294,967,295	%u
long int	4	-2,147,483,648 – to – 2,147,483,647	%ld
unsigned long int	4	0 – to - 4,294,967,295	%lu
long long int	8	-(2^63) – to – (2^63)-1	%lld
unsigned long long int	8	0 – to – 18,446,744,073,709,551,615	%llu
Signed char	1	-128 – to - 127	%c
Unsigned char	1	0 – to - 255	%c
float	4	1.2E-38 – to – 3.4E+38	%f
double	8	1.7E-308 – to – 1.7E+308	%lf
long double	16	3.4E-4932 – to – 1.1E+4932	%Lf

The main differences between float and double are

"float has single precision and has precision of 6 decimal places. float takes 4 bytes. double has the double precision or you can say two times more precision than float and has precision of 15 decimal places. double takes 8 bytes."

Output & Input Statement In C Programming:

printf() is used for print any statement in console. It also used for showing the output of any kind of operation. printf() is a predefined function which is used to print value of a variable or an expression.

Input statement means taking input from keyboard. getch() and scanf() are both are used as for taking input statement from keyboard. But there is a difference between getch() and scanf().

In getch() we can able take only one input from keyboard but in other side in scanf() we can take multiple input from keyboard. It means scanf() can take data as a sequence of characters and uses space, tab and new line character as a data separator. it can data into desired type and it can store data in specified variable.