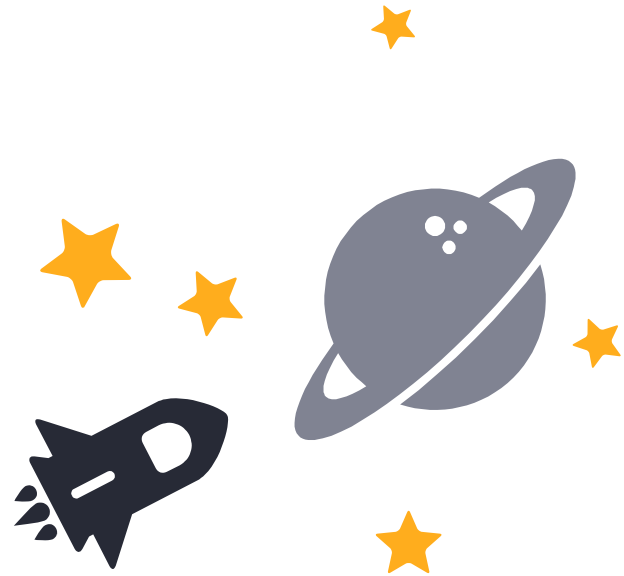# Data Structures

lecture 2
21-9-2022

Unit 1: Basics of Data Structures

Concept of Data

- Data is a useful information stored in the memory of Computer.

- Every computer stores and processes data in form of 0's and 1's (Binary Language)

A Closer look to memory

Primary Memory (RAM)

- Volatile (Temporary) Memory.

- Contains data as long as power supply is provided.

- Data is vanished as soon as computer turns off

Secondary Memory (HDD)

- Non-volatile (Permanent) Memory.

- Contains data even if power supply is off.

- Data will not be deleted until done explicitly

What are Data Structures?

- Way of storing and organizing data in memory

- so that it can be accessed and processed efficiently.

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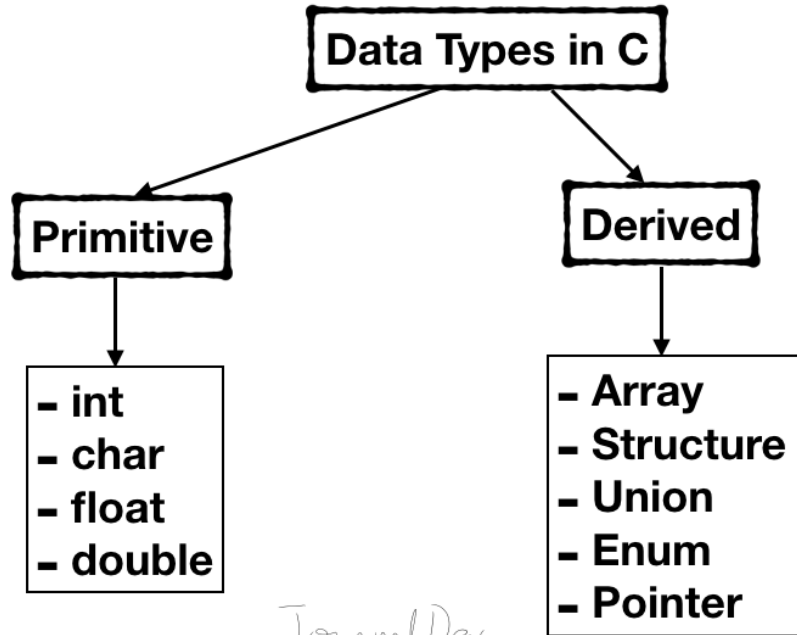There is **no any fixed data structrue which will be efficient always.**

Depending on your requirement and project, **choose the right data structure** for your project.

Data Types

- Most basic and the most common classification of data.

- Tells about
    - type of data is to be stored
    - how much space it requires in the memory.

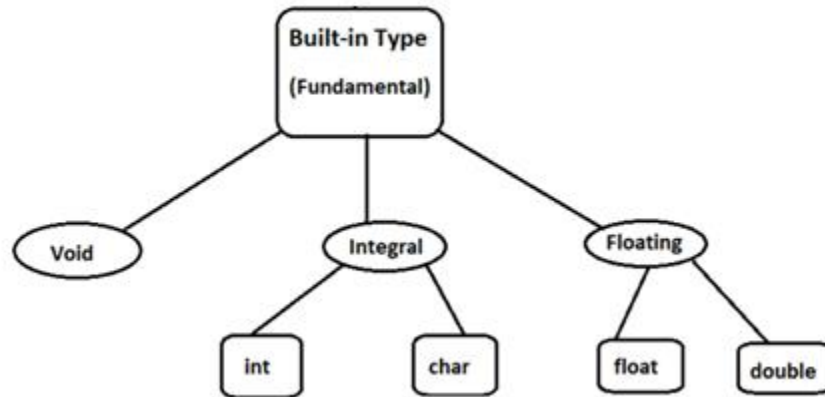- Depending on Programming language supported data types might change.

Data Types in C Programming Language

Primitive Data Types

- Also called as Basic /Built in Data types.

Data Types and Size

Type	Size (bits)	Size (bytes)	Range
char	8	1	-128 to 127
unsigned char	8	1	0 to 255
int	16	2	-2^{15} to $2^{15}-1$
unsigned int	16	2	0 to $2^{16}-1$
short int	8	1	-128 to 127
unsigned short int	8	1	0 to 255
long int	32	4	-2^{31} to $2^{31}-1$
unsigned long int	32	4	0 to $2^{32}-1$
float	32	4	3.4E-38 to 3.4E+38
double	64	8	1.7E-308 to 1.7E+308
long double	80	10	3.4E-4932 to 1.1E+4932