/

Datatypes

The datatypes represent the type of data that we store into the memory. The datatypes in java language are classified into three types**:**

1) **Primitive data type:** The primitive datatypes are predefined and designed to store a single value.
   Example: int, char etc.
2) **Derived data type:** The derived datatypes are predefined and designed to store multiple values.
   Example: array
3) **User defined data type:** If a datatype is created by the user or the programmer, then it is called as user defined datatype. Using the user defined datatype we can store any number of values and any type of values, according to the application requirement.
   Example: class

Primitive data types: The primitive data types are designed to store a single value and they are used to store the basic inputs required for a program. The primitive data types are also called as fundamental data types.

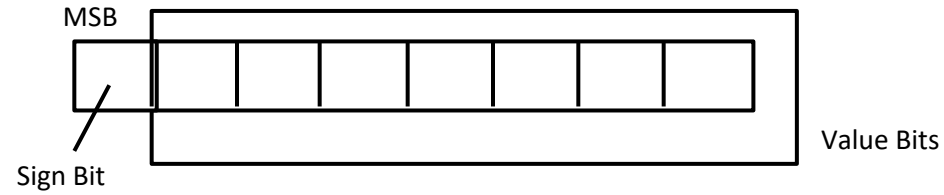
The java language provides 8 primitive data types and they are classified into 4 categories**:**

1) Integer Category
2) Floating-Point Category
3) Character Category
4) Boolean Category

1) **Integer Category:** This category can be used for storing numbers, either positive or negative without a decimal point. Under the integer category we have 4 primitive data types and they are**:**
   1. byte
   2. short
   3. int
   4. long

   All the 4 primitive data types are used for storing same kind of data, but their sizes and ranges are different so that the memory can be utilized efficiently without any wastage.

Datatype	Size	Range
byte	1	-128 to 127
short	2	-32768 to 32767
int	4	-2147483648 to 2147483647
long	8	-9223372036854775808 to 9223372036854775807



2) **Floating-Point Category:** This category used for storing numbers either positive or negative with decimal point. Under the floating point category we have two primitive data types and they are**:**
   1. float
   2. double

   Both the primitive data types under floating-point category are used for storing same kind of data, but their sizes and ranges are different so that the memory can be utilized efficiency without wastage.

Datatype	Size	Range	Number of decimal digits
float	4	1.4E-45 to 3.4E38	7
double	8	4.9E-324 to 1.79E308	15

3) **Character Category:** This category can be used for storing a single character. A character can be represented by either one alphabet or one digit or one special symbol. Under the character category there is only on primitive data type and it is char.

Datatype	Size	Range
char	2	0 to 65535

Q) Why is the size of char 1 byte in C language and 2 bytes in Java?
A) When an application is developed in C language, it uses the characters of only english language. To store the English language characters 1 byte of memory is sufficient. The C language uses ASCII Character Set (0-255).

When an application is developed in Java language, it uses the characters of all the foreign languages. To store the characters of all languages 1 byte of memory is not sufficient, therefore the size is increased to 2 bytes in Java language. The Java language uses UNICODE Character Set (0-65535).

4) **Boolean Category:** This category is used for storing either true or false. Under the boolean category we have only one primitive type i.e. boolean.

Datatype	Size	Range
boolean	JVM Dependent	true false