

## Assignment No:- 24

Q) What are the data types in java

→ In java data types specify the type of values that variables can store. Java has two main categories of data type

① Primitive Data Types - Stores simple values

② Non- Primitive Data Types - Stores objects.

### Primitive Data Types

datatype	size	Default value	example	Description
byte	1 byte	0	byte a = 100;	small integer
short	2 bytes	0	short s = 3000;	Medium integer
int	4 bytes	0	int x = 100000;	Default integer
long	8 bytes	0L	long l = 1000000L	Large integer
float	4 bytes	0.0f	float f = 10.5f;	decimal values
double	8 bytes	0.0d	double d = 99.99f	More precise decimal
char	2 bytes	'U0000'	char c = 'A';	Single character
boolean	1bit	false	boolean flag = true;	true or false values

### Non Primitive Data Types

string	String name = "Java";	Sequence of character
Array	int [] arr = {1,2,3};	collection of similar data
class	class MyClass {}	User-defined blueprint for object.
interface	interface MyInterface {}	Abstract blueprint for classes.

Q.2) Why the size of all data types in java is same on all platforms and all architecture is same?

→ Unlike languages like c/c++, where data type size depend on the architecture and os.

## • Reasons

- Reasons
    - 1) Java is platform-independent ("write once, run anywhere")
    - 2) Java uses virtual machine
    - 3) Avoids portability issues.
    - 4) Memory management by JVM.

Q3] What is the use of UNICODE system as compared to ASCII?

ASCII

## UNICODE

Q4) What is meant by managed memory?

- Managed memory refers to a memory management system where the programming language or runtime environment automatically handles memory allocation and deallocation instead of relying on the programmer. This prevents issues like memory leaks, dangling pointers and buffer overflow.

#### • Managed Memory in Java

Java manages memory through the Java Virtual Machine which provides:

##### 1) Automatic Garbage Collection

The JVM automatically removes unused objects, preventing memory leaks.

No need for free() or delete() like in C/C++.

##### 2) Heap and Stack Management

Heap stores objects and dynamically allocated memory.

Stack stores local variables and method call information.

##### 3) Memory Safety

No dangling pointers (Java does not allow direct memory access like C++).

No buffer overflows (Java checks array bounds).

Q5) What are different types of characteristics and behaviours in java?

- In java, characteristics and behavior refer to the properties (attributes) and actions (methods) of objects in object-oriented programming.

##### 1) Characteristics (Attributes/Properties)

Characteristics define the state of an object. They are represented as fields (variables) in a java class.

• Instance variable - Unique to each object of the class

- class variables (static variables) - shared among all instances of the class.
- final variables - constants that cannot be changed after initialization.

## ② Behavior (Methods)

Behavior represents actions an object can perform. It is implemented using method in java.

- Instance Methods - operate on instance variables.
- Static Methods - operate at the class level.
- Constructors - Special methods used to initialize objects.
- Abstract Methods - Declared without implementation.
- Final Methods - Cannot be overridden by subclasses.

## Q6] Explain the prototype of main function in Java.

→ In java, the main() function serves as the entry point for a java application. Its prototype follows a special structure.

• `public static void main(Staing [] args)`

• public - The method must be accessible from anywhere because the JVM needs to call it from outside the class.

Static - Allows the method to be executed without creating an instance of the class.

Void - The method does not return any value.

main - The predefined name recognized by the JVM as the program's entry point.

Staing [] args - An array of command-line arguments passed to be the program.

- Q7) What are the types of loops in Java.  
→ Java provides four types of loops to execute a block of code repeatedly based on the condition.

### 1) for loop -

Used when the number of iterations is known in advance.

Syntax:-

```
for (condition initialization; condition; increment/de) {  
    // Code }
```

ex -

```
for (int i = 1; i ≤ 5; i++) {  
    System.out.println("Iteration: " + i); }
```

### 2) while loop -

Used when the number of iterations is not known in advance. The loop executes as long as the condition is true.

Syntax -

```
while (condition) {  
    // Code }
```

ex -

```
int i = 1;  
while (i ≤ 5) {  
    System.out.println("Iteration: " + i);  
    i++; }
```

### 3) do-while loop -

Similar to while, but executes at least once even if the condition is false.

Syntax-

do { // code }

} while (condition);

ex -

int i = 1;

do { System.out.println("Iteration :" + i);  
i++;

} while (i &lt;= 5);

Q8]

How to create object in java?

→ As java is dynamic we have to create object using new keyword.

The new keyword in java used to create memory dynamically

The memory allocated in heap and every object is in heap memory.

Syntax

classname objectName = new className();

example

class Car {

String brand;

void display() {

System.out.println("Car brand :" + brand);

}

public class Main {

public static void main(String[] args) {

Car myCar = new Car(); // Object creation

myCar.brand = "Toyota";

myCar.display();

}

}

Q3] What are types of arrays in Java?

→ In java arrays are used to store multiple values of the same data type.

There are three main types of arrays.

### 1) Single-Dimensional Array

A one-dimensional array stores elements in a linear sequence.

ex-

```
public class
```

```
int [] arr = new int [5]; // declare and allocate memory
```

```
arr[0] = 10; // assign values
```

```
arr[1] = 20;
```

```
arr[2] = 30;
```

```
int [] arr2 = {10, 20, 30, 40, 50}; // direct initialization
```

### 2) Multi-Dimensional Array

A multi-dimensional array is an array of arrays.

```
int [][] matrix = {
```

```
    {1, 2, 3},
```

```
    {4, 5, 6},
```

```
    {7, 8, 9}
```

```
};
```

### 3) Jagged Array

Jagged array is a multi-dimensional array where each row can have a different of columns.

ex-

```
public class array3 {
```

```
    public static void main (String [] args) {
```

```
        int Arr [] [] = {
```

{ 10, 20, 30 },  
{ 40, 50 },  
{ 60, 70, 80, 90 },  
{ 100, 110, 120, 130, 140 },  
{ 150 }.  
};  
}

Q. 10] what is mean by object reference in java.

→ An object reference in java is a variable that stores the memory address of an object rather than the object itself.

It acts as a pointer to access the object's data and methods.

- Object reference - Stores memory address of an object.

- Multiple reference - Different variables can refer to the same object.

- Null reference

A reference without an assigned object.

- Method calls -

Objects are passed by reference value in methods.