

Java Notes (Sample)

1. Introduction to Java

- Java is an object-oriented, class-based, high-level programming language.
- It was developed by James Gosling at Sun Microsystems in 1995.
- Java is platform-independent because of the JVM (Java Virtual Machine).

2. Features of Java

- Simple: Easy to learn and use.
- Object-Oriented: Everything in Java is treated as an object.
- Platform Independent: "Write once, run anywhere".
- Robust: Strong memory management and exception handling.
- Secure: Provides a secure runtime environment.
- Multithreaded: Can perform multiple tasks simultaneously.

3. Java Basics

Every Java program must have a main method:

```
```java
public class Hello {
 public static void main(String[] args) {
 System.out.println("Hello, World!");
 }
}
```
```

Data Types:

- Primitive: int, float, char, boolean, etc.
- Non-Primitive: String, Array, Class, etc.

4. OOP Principles

1. Encapsulation – Binding data and methods together (using classes).
2. Inheritance – Acquiring properties of another class using extends.
3. Polymorphism – Ability to take many forms (method overloading/overriding).
4. Abstraction – Hiding implementation details using abstract classes and interfaces.

5. Control Statements

- If-Else
- Switch Case
- Loops: for, while, do-while, and enhanced for loop.

Example:

```
```java
for(int i = 1; i <= 5; i++) {
 System.out.println("Count: " + i);
}
```
```

6. Exception Handling

Used to handle runtime errors.

Keywords: try, catch, finally, throw, throws.

Example:

```
```java
try {
 int x = 10 / 0;
} catch (ArithmeticException e) {
 System.out.println("Error: Division by zero!");
}
```
```

7. Java Collections Framework

Provides data structures like:

- List (ArrayList, LinkedList)
- Set (HashSet, TreeSet)
- Map (HashMap, TreeMap)