**ASSIGNMENT-2**

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**1)Give me some idea on what is a Data type. What are Primitive Data types and Non-Primitive Data types. Explain with some examples.**

What is a Data Type?

A **data type** is a classification that specifies which type of value a variable can hold in a programming language. It defines the size, type of operations, and memory storage required for a variable. Data types ensure that the correct type of data is assigned to variables, preventing type-related errors in a program.

**Primitive data types** are the basic building blocks of data manipulation in programming. They represent single values and are generally predefined by the programming language.

**Examples of primitive data types:**

| **Data Type** | **Description** | **Example (Java/Python)** |
| --- | --- | --- |
| **Integer (int)** | Stores whole numbers | int x = 10; (Java)  x = 10 (Python) |
| **Floating Point (float, double)** | Stores decimal numbers | float pi = 3.14f; (Java)  pi = 3.14 (Python) |
| **Character (char)** | Stores a single character | char letter = 'A'; (Java)  letter = 'A' (Python uses str for characters) |
| **Boolean (boolean)** | Stores true or false values | boolean flag = true; (Java)  flag = True (Python) |

**Non-Primitive Data Types**

**Non-primitive data types** (also called **reference types**) are more complex than primitive types. They refer to objects and can store multiple values or a combination of different data types.

**Examples of Non-Primitive Data Types:**

| **Data Type** | **Description** | | **Example (Java/Python)** |
| --- | --- | --- | --- |
| **String** | Stores a sequence of characters | | String name = "John"; (Java)  name = "John" (Python) |
| **Array** | Stores multiple values of the same data type | | int[] arr = {1, 2, 3}; (Java)  arr = [1, 2, 3] (Python uses lists) |
| **Class** | A blueprint for creating objects | | class Car {} (Java)  class Car: (Python) |
|  | |
| **Interface** (Java) | Defines methods that a class must implement | | interface Vehicle {} |
| **List** | Dynamic array-like structure | | List<Integer> nums = new ArrayList<>(); (Java)  nums = [1, 2, 3] (Python) |
| **Dictionary (Map in Java)** | Stores key-value pairs | | Map<String, Integer> map = new HashMap<>(); (Java)  map = {"name": "John", "age": 30} (Python) |

**Key Differences:**

| **Feature** | **Primitive Data Type** | **Non-Primitive Data Type** |
| --- | --- | --- |
| **Storage** | Stores single values | Stores multiple values or objects |
| **Size** | Fixed | Can grow dynamically |
| **Operations** | Simple operations (arithmetic, comparison) | Advanced operations (methods, iteration) |
| **Examples** | int, float, char, boolean | String, Array, List, Dictionary, Class |