In Java, constants and variables are used to store and manipulate data.

They represent named memory locations that hold values of different types.

Here’s a brief explanation of constants and variables in Java:

1. Constants:

- Constants are identifiers whose values cannot be changed once they are assigned.
- In Java, constants are typically declared using the final keyword, which makes them unmodifiable.
- Constants are commonly used to represent fixed values, such as mathematical constants, configuration settings, or any value that should remain constant throughout the program.
- Constants can be of primitive types (e.g., int, double, char) or reference types (e.g., String, Object).

Example:

```
final int MAX_VALUE = 100;
final double PI = 3.14159;
final String MESSAGE = "Welcome!";
```

2. Variables:

- Variables are identifiers that hold data that can be modified during the program’s execution.

- Variables are declared by specifying the data type followed by the variable name.
- Variables can store values of primitive types or references to objects.
- The value of a variable can be assigned, updated, and used in various operations.

Example:

```
int age = 25;
double salary = 5000.0;
String name = "John Doe";
```

3. Variable Naming Rules:

- Variable names in Java should follow certain rules:
- They must start with a letter (a-z or A-Z), underscore (_), or dollar sign ($).
- After the first character, they can include letters, digits (0-9), underscores, or dollar signs.
- Variable names are case-sensitive.
- It’s recommended to use meaningful names that reflect the purpose of the variable.
- Reserved words (keywords) cannot be used as variable names.

4. Variable Initialization:

- Variables should be initialized with a value before they are used.
- Uninitialized variables have a default value depending on their data type (e.g., 0 for numeric types, false for boolean, null for reference types).

Example:

```
int x; // Uninitialized variable
x = 10; // Variable initialization

int y = 20; // Declaration and initialization in a single statement
```

Difference between Contants and Variables in Java :

	Constants	Variables
Definition	Named memory locations with unchangeable values	Named memory locations with changeable values
Declaration	Declared using the final keyword	Declared without the final keyword
Value	Value cannot be modified once assigned	Value can be modified during program execution
Naming	Typically named using uppercase letters and underscores	Typically named using lowercase letters and camel case
Usage	Used to represent fixed values that remain constant throughout the program	Used to store and manipulate data during program execution
Data Type	Can be of primitive types or reference types	Can be of primitive types or reference types
Initialization	Must be initialized at the time of declaration or in a constructor/block	Must be initialized before use or assigned a value during runtime
Example	final int MAX_VALUE = 100;	int count = 0;

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