



Datatypes in java

In Java, **data types** specify the different sizes and types of values that can be stored in a variable. Java's data types can be categorized into two main types:

1. **Primitive Data Types**: These are the basic types of data built into Java and are not objects.
2. **Reference Data Types**: These refer to objects and allow the programmer to access fields and methods from classes.

1. Primitive Data Types:

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Type	Size (in bytes)	Default Value	Range
byte	1	0	-128 to 127
short	2	0	-32,768 to 32,767
int	4	0	-2^{31} to $2^{31}-1$
long	8	0L	-2^{63} to $2^{63}-1$
float	4	0.0f	approximately $\pm 3.40282347E+38F$
double	8	0.0d	approximately $\pm 1.79769313486231570E+308$
char	2	'\u0000'	0 to 65,535 (unsigned)
boolean	1 (but JVM optimized)	false	true or false

2. Reference Data Types:

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Reference types store addresses (or references) to objects in memory. They include **classes**, **interfaces**, **arrays**, and **enumerations**.

10 Examples of Data Types in Java:

1. ****Integer (`int`)**:**

```
```java
```

```
int age = 25;
```

```
```
```

Stores whole numbers from -2^{31} to $2^{31}-1$.

2. ****Floating-point (`float`)**:**

```
```java
```

```
float price = 19.99f;
```

```
```
```

Stores fractional numbers with single precision (requires `f` suffix).

3. ****Double (`double`)**:**

```
```java
```

```
double pi = 3.1415926535;
```

```
```
```

Stores larger floating-point numbers with double precision.

4. ****Character (`char`)**:**

```
```java
```

```
char initial = 'A';
```

```
```
```

Stores a single 16-bit Unicode character.

5. ****Boolean (`boolean`)**:**

```
```java
```

```
boolean isStudent = true;
```

```
```
```

Stores true or false values.

6. ****Byte (`byte`)**:**

```
```java
byte level = 100;
...`
```

Stores small integers from -128 to 127.

7. **\*\*Short (`short`)\*\*:**

```
```java
short year = 2024;
...`
```

Stores whole numbers from -32,768 to 32,767.

8. ****Long (`long`)**:**

```
```java
long distance = 9876543210L;
...`
```

Stores large integers from  $-2^{63}$  to  $2^{63}-1$  (requires `L` suffix).

9. **\*\*String (`String`)\*\* (Reference Type):**

```
```java
String name = "Alice";
...`
```

A reference type that stores a sequence of characters.

10. ****Array (Reference Type)**:**

```
```java
int[] numbers = {1, 2, 3, 4, 5};
...`
```

...

Stores multiple values of the same type in a single variable.

These data types allow Java to handle a wide range of operations efficiently.