## 8 Primitive Data Types

### 1. boolean type

* The boolean data type has two possible values, either true or false.
* Default value: false.
* They are usually used for **true/false** conditions.

### Example 1: Java boolean data type

class Main {

public static void main(String[] args) {

boolean flag = true;

System.out.println(flag); // prints true

}

}

### 2. byte type

* The byte data type can have values from **-128** to **127** (8-bit signed two's complement integer).
* If it's certain that the value of a variable will be within -128 to 127, then it is used instead of int to save memory.
* Default value: 0

### Example 2: Java byte data type

class Main {

public static void main(String[] args) {

byte range;

range = 124;

System.out.println(range); // prints 124

}

}

### 3. short type

* The short data type in Java can have values from **-32768** to **32767** (16-bit signed two's complement integer).
* If it's certain that the value of a variable will be within -32768 and 32767, then it is used instead of other integer data types (int, long).
* Default value: 0

### Example 3: Java short data type

class Main {

public static void main(String[] args) {

short temperature;

temperature = -200;

System.out.println(temperature); // prints -200

}

}

### 4. int type

* The int data type can have values from **-231** to **231-1** (32-bit signed two's complement integer).
* If you are using Java 8 or later, you can use an unsigned 32-bit integer. This will have a minimum value of 0 and a maximum value of 232-1. To learn more, visit [How to use the unsigned integer in java 8?](http://stackoverflow.com/questions/25556017/how-to-use-the-unsigned-integer-in-java-8)
* Default value: 0

### Example 4: Java int data type

class Main {

public static void main(String[] args) {

int range = -4250000;

System.out.println(range); // print -4250000

}

}

### 5. long type

* The long data type can have values from **-263** to **263-1** (64-bit signed two's complement integer).
* If you are using Java 8 or later, you can use an unsigned 64-bit integer with a minimum value of **0** and a maximum value of **264-1**.
* Default value: 0

### Example 5: Java long data type

class LongExample {

public static void main(String[] args) {

long range = -42332200000L;

System.out.println(range); // prints -42332200000

}

}

Notice, the use of L at the end of -42332200000. This represents that it's an integral literal of the long type. You will learn about integral literals later in this article.

### 6. double type

* The double data type is a double-precision 64-bit floating-point.
* It should never be used for precise values such as currency.
* Default value: 0.0 (0.0d)

### Example 6: Java double data type

class Main {

public static void main(String[] args) {

double number = -42.3;

System.out.println(number); // prints -42.3

}

}

### 7. float type

* The float data type is a single-precision 32-bit floating-point.Learn more about [single-precision and double-precision floating-point](http://stackoverflow.com/questions/801117/whats-the-difference-between-a-single-precision-and-double-precision-floating-p) if you are interested.
* It should never be used for precise values such as currency.
* Default value: 0.0 (0.0f)

### Example 7: Java float data type

class Main {

public static void main(String[] args) {

float number = -42.3f;

System.out.println(number); // prints -42.3

}

}

Notice that, we have used -42.3f instead of -42.3in the above program. It's because -42.3 is a double literal.

To tell the compiler to treat -42.3 as float rather than double, you need to use f or F.

If you want to know about single-precision and double-precision, visit [Java single-precision and double-precision floating-point](http://stackoverflow.com/questions/801117/whats-the-difference-between-a-single-precision-and-double-precision-floating-p).

**8. char type**

* It's a 16-bit Unicode character.
* The minimum value of the char data type is '\u0000' (0) and the maximum value of the is '\uffff'.
* Default value: '\u0000'

**Example 8: Java char data type**

class Main {

public static void main(String[] args) {

char letter = '\u0051';

System.out.println(letter); // prints Q

}

}

Here, the Unicode value of Q is **\u0051**. Hence, we get Q as the output.

Here is another example:

class Main {

public static void main(String[] args) {

char letter1 = '9';

System.out.println(letter1); // prints 9

char letter2 = 65;

System.out.println(letter2); // prints A

}

}

Here, we have assigned 9 as a character (specified by single quotes) to the letter1 variable. However, the letter2 variable is assigned 65 as an integer number (no single quotes).

Hence, A is printed to the output. It is because Java treats characters as integral types and the ASCII value of A is 65. To learn more about ASCII, visit [What is ASCII Code?](https://www.ascii-code.com/).

**String type**

Java also provides support for character strings via java.lang.String class. Strings in Java are not primitive types. Instead, they are objects. For example,

String myString = "Java Programming";

Here, myString is an object of the String class.

**MCQ’s**

**1) What does a Data Type in Java refers to?**

A) The place where data is stored

B) The technique how data is retreived

C) The type or variety of data being handled for reading and writing

D) None of the above

Answer [=]

**C**

**Explanation:**

**Integers, Real numbers, Boolean, Characters etc**

**2) Choose the wrong statement about Java programming?**

A) Java supports unsigned integers

B) Java supports signed integers

C) Java supports signed char

D) None of the above

Answer [=]

**A**

**Explanation:**

**Only C language supports unsigned integers. Java does not support.**

**3) Which data type among the following is an implementation of Objects or OOPs?**

A) byte

B) int

C) char

D) None of the above

Answer [=]

**D**

**Explanation:**

**All primitive data types are implemented in a Non-Object Oriented way.**

**4) What is a Primitive Data Type in Java?**

A) Data type, which is implemented in an Object-oriented way.

B) Data Type which is implemented in a machine-dependent way

C) Data Type which is implemented in a non-object oriented way.

D) None of the above

Answer [=]

**C**

**5) which among the following is not a Data Type in Java?**

A) short

B) int

C) long double

D) double

Answer [=]

**C**

**Explanation:**

**"long double" is present only in C language.**

**6) Which among the following is not a valid Data Type in Java?**

A) long

B) bool

C) double

D) float

Answer [=]

**B**

**Explanation:**

**It is "boolean" not "bool".**

**7) Which is the data type used mostly to handle streams and buffers in Java language?**

A) short

B) int

C) byte

D) float

Answer [=]

**C**

**8) Which is the data type that is not recommended for numeric applications in Java?**

A) byte

B) float

C) int

D) long

Answer [=]

**A**

**Explanation:**

**Size of a byte is only 8 bits. Also, any arithmetic operation produces output in int, float or double. It cannot handle more data.**

**9) Choose the number range for byte data type in Java?**

A) -127 to +128

B) -128 to +127

C) 0 to 256

D) 0 to 255

Answer [=]

**B**

**10) What is the size of a SHORT integer in Java?**

A) 1 byte

B) 2 bytes

C) 4 bytes

D) 8 bytes

Answer [=]

**11) What is the size of an INT integer in Java?**

A) 2 bytes

B) 4 bytes

C) 6 bytes

D) 8 bytes

Answer [=]

**B**

**Explanation:**

**Number range is -2147483648 and 2147483647.**

**12) What is the size of a LONG integer in Java?**

A) 2 bytes

B) 4 bytes

C) 8 bytes

D) 16 bytes

Answer [=]

**C**

**Explanation:**

**Range: -9223372036854775808 and 9223372036854775807.**

**13) What is the size of a FLOAT floating point number in Java?**

A) 2 bytes

B) 4 bytes

C) 6 bytes

D) 8 bytes

Answer [=]

**B**

**Explanation:**

**Number range is ±3.40282347E+38F**

**14) What is the size of a DOUBLE floating point number in Java?**

A) 4 bytes

B) 6 bytes

C) 8 bytes

D) 16 bytes

Answer [=]

**C**

**Explanation:**

**Number range is ±1.79769313486231570E+308.**

**15) What is the size of a CHAR data type constant in Java?**

A) 1 byte

B) 2 bytes

C) 4 bytes

D) 6 bytes

Answer [=]

**B**