

Java Cheatsheet

Basics

Boilerplate

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

- `public` → Access modifier (needed for JVM to call `main`).
 - `static` → Allows JVM to call without creating an object.
 - `void` → Method returns nothing.
 - `String[] args` → Command-line arguments.
-

Showing Output

```
System.out.print("Hello");    // prints without newline  
System.out.println(" World"); // prints with newline  
System.out.printf("Age: %d", 20); // formatted output
```

Taking Input (Scanner)

```
import java.util.Scanner;  
  
class InputExample {
```

```

public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);

    String name = sc.nextLine();    // String
    int age = sc.nextInt();         // int
    float f = sc.nextFloat();       // float
    double d = sc.nextDouble();     // double
    boolean b = sc.nextBoolean();   // boolean
    char c = sc.next().charAt(0);   // char (first char of input)

    System.out.println("Name: " + name);
}
}

```

Primitive Types

Eight primitives: `byte` , `short` , `int` , `long` , `float` , `double` , `boolean` , `char` .

- `byte` (8-bit, -128 to 127)
- `short` (16-bit, -32,768 to 32,767)
- `int` (32-bit, default for integers)
- `long` (64-bit, append `L` for literals)
- `float` (32-bit, append `f`)
- `double` (64-bit, default for decimals)
- `boolean` (`true` or `false`)
- `char` (16-bit Unicode)

Comments

```

// Single line
/* Multi-line */
/** Javadoc comment */

```

Constants

```
final double PI = 3.14159;  
static final int MAX = 100;
```

Arithmetic Operators

+ - * / % ++ --

- Division between integers truncates result.
- % gives remainder.

Assignment Operators

=, +=, -=, *=, /=, %=

Comparison Operators

==, !=, >, <, >=, <=

Logical Operators

&& (AND), || (OR), ! (NOT)

Escape Sequences

- `\n` → newline
- `\t` → tab
- `\\` → backslash
- `\'` → single quote
- `\"` → double quote
- `\r` → carriage return
- `\b` → backspace

(`\?` is not valid in Java; use `"?"` literally.)

Type Casting

Widening (automatic)

```
int x = 45;
double y = x; // OK
```

Narrowing (manual)

```
double d = 45.9;
int n = (int) d; // truncates decimal
```

Control Flow

if / else if / else

```
if (x > 0) { ... }  
else if (x == 0) { ... }  
else { ... }
```

Ternary

```
String result = (x > 0) ? "Positive" : "Negative";
```

switch (Java 7+ supports Strings)

```
switch(day) {  
    case 1: System.out.println("Mon"); break;  
    ...  
    default: System.out.println("Invalid");  
}
```

Loops

while

```
while (i < 5) {  
    i++;  
}
```

do-while

```
do {  
    i++;  
} while (i < 5);
```

for

```
for (int i = 0; i < 5; i++) { ... }
```

for-each

```
for (int n : arr) { ... }
```

break / continue

- `break` → exits loop
 - `continue` → skips iteration
-

Arrays

```
int[] nums = new int[5];  
String[] names = {"Harry", "Rohan"};  
System.out.println(names.length);
```

Multi-dimensional

```
int[][] matrix = {  
    {1, 2, 3},  
    {4, 5, 6}  
};  
System.out.println(matrix[1][2]); // 6
```

Methods

```
static int add(int a, int b) {  
    return a + b;  
}  
  
public static void main(String[] args) {  
    System.out.println(add(5, 10));  
}
```

Method Overloading

```
void sum(int a, int b) { ... }  
void sum(double a, double b) { ... }
```

Recursion

```
int fact(int n) {  
    if (n == 0) return 1;  
    return n * fact(n - 1);  
}
```

Strings

Strings are objects of `java.lang.String`.

```
String s = "Hello";  
int len = s.length();  
s.toUpperCase();  
s.toLowerCase();  
s.indexOf("l");  
s.contains("He");
```

```
s.equals("Hello");  
s.equalsIgnoreCase("hello");  
s.substring(0, 3); // "Hel"  
s.replace("H", "J");
```

Math Class

```
Math.max(5, 10);  
Math.min(5, 10);  
Math.sqrt(16);  
Math.pow(2, 3);  
Math.abs(-10);  
Math.random(); // [0.0, 1.0)
```