

Core Java Cheatsheet

Primitive Data Types

Let's start off by learning the primitive *data types* that Java offers:

| Data Type | Size | Range |
|----------------|------|---|
| <i>byte</i> | 8 | -128..127 |
| <i>short</i> | 16 | -32,768..32,767 |
| <i>int</i> | 32 | -2,147,483,648.. 2,147,483,647 |
| <i>long</i> | 64 | -9,223,372,036,854,775,808.. 9,223,372,036,854,775,807 |
| <i>float</i> | 32 | 3.4e-0.38.. 3.4e+0.38 |
| <i>double</i> | 64 | 1.7e-308.. 1.7e+308 |
| <i>char</i> | 16 | Complete Unicode Character Set |
| <i>Boolean</i> | 1 | True, False |

Java Operators

There are mainly 8 different types of *operators* available in Java:

| Operator Type | Operators |
|---------------|---|
| Arithmetic | +, -, *, /, %, ++, -- |
| Assignment | =, +=, -=, *=, /=, %=, &=, ^=, =, <<=, >>=, >>>= |
| Bitwise | ~, &, |
| Logical | &&, |
| Relational | <, >, <=, >=, ==, != |
| Shift | <<, >>, >>> |
| Ternary | ?: |
| Unary | ++x, --x, x++, x--, +x, -x, !, ~ |

Java Variables

Variables in Java refers to the name of the reserved memory area. You need variables to store any value for the computational or reference purpose.

There are 3 types of variable in Java:

1. Local Variables
2. Instance Variables
3. Static Variables

```
{public | private} [static] type name [= expression | value];
```

Java Methods

A method is a set of code that is grouped together to perform a specific operation. A method is completed in two steps:

1. Method Initialization
2. Method Invocation

A method can be invoked either by calling it by reference or by value.

```
{public | private} [static] {type | void} name(arg1, ..., argN ){statements}
```

Data Conversion

The process of changing a value from one data type to another type is known as data type conversion. Data Type conversion is of two types:

1. Widening: The lower size datatype is converted into a higher size data type without loss of information.
2. Narrowing: The higher size datatype is converted into a lower size data type with a loss of information.

```
// Widening (byte<short<int<long<float<double)  
int i = 10; //int--> long  
long l = i; //automatic type conversion// Narrowing
```

```
double d = 10.02;  
long l = (long)d; //explicit type casting// Numeric values to String  
String str = String.valueOf(value);// String to Numeric values  
int i = Integer.parseInt(str);  
double d = Double.parseDouble(str);
```

User Input

Java provides three ways to take an input from the user/ console:

1. *Using BufferedReader class*

2. *Using Scanner class*

3. *Using Console class*

```
// Using BufferedReader  
BufferedReader reader = new BufferedReader(new  
InputStreamReader(System.in));  
String name = reader.readLine();  
// Using Scanner  
Scanner in = new Scanner(System.in);  
String s = in.nextLine();  
int a = in.nextInt();  
// Using Console  
String name = System.console().readLine();
```

Basic Java Program

A basic program in Java will consist of at least the following components:

1. *Classes & Objects*

2. *Methods*

3. Variables

```
public class Demo{  
    public static void main(String[] args)  
{ System.out.println("Hello from edureka!");}  
}
```

Compile a Java Program

You need to save your Java Program by the name of the class containing main() method along with .java extension.

`className.java`

Call the compiler using javac command.

`javac className`

Finally, execute the program using below code:

`java className`

Flow Of Control

Iterative Statements

Iterative statements are used when you need to repeat a set of statements until the condition for termination is not met.

```
// for loop
for (condition) {expression} // for each loop
for (int i: someArray) {} // while loop
while (condition) {expression} // do while loop
do {expression} while(condition)
```

Generating a Fibonacci series.

```
for (i = 1; i <= n; ++i){System.out.print(t1 + " + ");
int sum = t1 + t2;t1 = t2;t2 = sum;}
```

Creating a pyramid pattern.

```
k = 2*n - 2;
for(i=0; i<n; i++)
{ for(j=0; j<k; j++){System.out.print(" ");}
k = k - 1;
for(j=0; j<=i; j++ ){System.out.print("* ");}
System.out.println(); }
```

Decisive Statements

Selection statements used when you need to choose between alternative actions during execution of the program.

```
//if statement
if (condition) {expression} //if-else statement
if (condition) {expression} else {expression} //switch statement
switch (var)
{ case 1: expression; break; default: expression; break; }
```

Checking the given number is prime or not.

```
if (n < 2) { return false; } for (int i=2; i <= n/i; i++) {if (n%i == 0) return false;}return true;
```

Finding the factorial using recursion function.

```
int factorial(int n)
```

```
{    if (n == 0)
    {return 1;}    else
    {return(n * factorial(n-1));} }
```

Java Arrays

Single Dimensional (1-D)

Single Dimensional or 1-D array is a type of linear array in which elements are stored in a continuous row.

```
// Initializing type[] varName= new type[size];  
// Declaring type[] varName= new type[]{values1, value2,...};
```

Creating an array with random values.

```
double[] arr = new double[n];  
for (int i=0; i<n; i++)  
{a[i] = Math.random();}
```

Searching the max value in the array.

```
double max = 0;  
for(int i=0; i<arr.length(); i++)  
{ if(a[i] > max) max = a[i]; }
```

Reversing an array.

```
for(int i=0; i<(arr.length())/2; i++)  
{ double temp = a[i];  
  a[i] = a[n-1-i];  
  a[n-1-i] = temp;  
}
```

Multi Dimensional (2-D)

Two Dimensional or 2-D array is an array of an array where elements are stored in rows and columns.

```
// Initializing datatype[][] varName = new dataType[row][col];  
// Declaring datatype[][] varName = {{value1,  
value2....},{value1, value2....}..};
```

Transposing a matrix.

```
for(i = 0; i < row; i++){ for(j = 0; j < column; j++)  
{ System.out.print(array[i][j]+" "); } System.out.println(" ");}
```

Multiplying two matrices.

```
for (i = 0; i < row1; i++)
```

```
{ for (j = 0; j < col2; j++)  
  { for (k = 0; k < row2; k++)  
    { sum = sum + first[i][k]*second[k][j]; }  
    multiply[i][j] = sum;  
    sum = 0;  
  }  
}
```


Java Strings

Creating a String

String in Java is an object that represents a sequence of char values. A String can be created in two ways:

1. Using a literal
2. Using 'new' keyword

```
String str1 = "Welcome"; // Using literal
```

```
String str2 = new String("Eduureka"); // Using new keyword
```

The `java.lang.String` class implements `Serializable`, `Comparable` and `CharSequence` interfaces. Since the String object is immutable in nature Java provides two utility classes:

1. *StringBuffer*: It is a mutable class that is thread-safe and synchronized.
2. *StringBuilder*: It is a mutable class that is not thread-safe but is faster and is used in a single threaded environment.

String Methods

Few of the most important and frequently used String methods are listed below:

```
str1==str2 //compares address;
```

```
String newStr = str1.equals(str2); //compares the values
```

```
String newStr = str1.equalsIgnoreCase() //compares the values ignoring
```

```
the case
```

```
newStr = str1.length() //calculates length
```

```
newStr = str1.charAt(i) //extract i'th character
```

```
newStr = str1.toUpperCase() //returns string in ALL CAPS
```

```
newStr = str1.toLowerCase() //returns string in ALL
```

```
LOWERCASE
```

```
newStr = str1.replace(oldVal, newVal) //search and
```

```
replace
```

```
newStr = str1.trim() //trims surrounding whitespace
```

```
newStr = str1.contains("value"); //check for the values
```

```
newStr = str1.toCharArray(); // convert String to character type
```

```
array
```

```
newStr = str1.isEmpty(); //Check for empty String
```

```
newStr = str1.endsWith(); //Checks if string ends with the given  
suffix
```

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Java Programming

Java is a high level, general purpose programming language that produces software for multiple platforms. It was developed by James Gosling in 1991 and released by Sun Microsystems in 1996 and is currently owned by Oracle.

Primitive Data Types

| Type | Size | Range |
|---------|------|--|
| byte | 8 | -128..127 |
| short | 16 | -32,768..32,767 |
| int | 32 | -2,147,483,648..2,147,483,647 |
| long | 64 | 9,223,372,036,854,775,808..9,223,372,036,854,775,807 |
| float | 32 | 3.4e-038..3.4e+038 |
| double | 64 | 1.7e-308..1.7e+308 |
| char | 16 | Complete Unicode Character Set |
| Boolean | 1 | True, False |

Java Operators

| Type | Operators |
|------------|--|
| Arithmetic | +, -, *, /, %, ++, -- |
| Assignment | =, +=, -=, *=, /=, %=, &=, ^=, =, <<=, >>=, >>= |
| Bitwise | &, &, , ^, ~, ~, ~ |
| Logical | &&, , ! |
| Relational | <, >, <=, >=, ==, != |
| Shift | <<, >>, >>> |
| Ternary | ?: |
| Unary | ++, --, ++, --, ++, --, ++, -- |

Iterative Statements

// for loop
for (condition) {expression}

// for each loop
for (int i: someArray) {}

// while loop
while (condition) {expression}

// do while loop
do {expression} while(condition)

Fibonacci series

for (i = 1; i <= n; ++i)
{
 System.out.print(t1 + " ");
 int sum = t1 + t2; t1 = t2;
 t2 = sum;
}

Pyramid Pattern

k = 2*n - 2;
for(i=0; i<n; i++)
{
 for(j=0; j<k; j++){System.out.print(" ");}
 k = k - 1;
 for(j=0; j<i; j++){System.out.print("* ");}
 System.out.println();
}

Arrays In Java

1 - Dimensional

// Initializing
type[] varName= new type[size];

// Declaring
type[] varName= new type[]{value1, value2,...};

Array with Random Variables

double[] arr = new double[n];
for (int i=0; i<n; i++)
{a[i] = Math.random();}

Maximum value in an Array

double max = 0;
for (int i=0; i<arr.length(); i++)
{ if(a[i] > max) max = a[i]; }

Reversing an Array

for(int i=0; i<(arr.length())/2; i++)
{ double temp = a[i];
 a[i] = a[n-1-i];
 a[n-1-i] = temp; }

Multi - Dimensional Arrays

// Initializing
datatype[][] varName = new datatype[row][col];
// Declaring
datatype[][] varName = {{value1, value2,...},{value1, value2,...}};

Java Variables

{public|private} [static] type name [= expression|value];

Java Methods

{public|private} [static] {type | void} name(arg1, ..., argN){statements}

Data Type Conversion

// Widening (byte<short<int<long<float<double)
int i = 10; //int--> long
long l = i; //automatic type conversion
// Narrowing
double d = 10.02;
long l = (long)d; //explicit type casting
// Numeric values to String
String str = String.valueOf(value);
// String to Numeric values
int i = Integer.parseInt(str);
double d = Double.parseDouble(str);

User Input

// Using BufferedReader
BufferedReader reader = new BufferedReader(new
InputStreamReader(System.in));
String name = reader.readLine();
// Using Scanner
Scanner in = new Scanner(System.in);
String s = in.nextLine();
int a = in.nextInt();
// Using Console
String name = System.console().readLine();

Basic Java Program

public class Demo
{
 public static void main(String[] args)
 {
 System.out.println("Hello from edureka!");
 }
}

Save

className.java

Compile

javac className

Execute

java className

Decisive Statements

//if statement
if (condition) {expression}

//if-else statement
if (condition) {expression} else {expression}

//switch statement
switch (var) { case 1: expression; break;
default: expression; break; }

Prime Number

if (n < 2)
{
 return false;
}
for (int i=2; i <= n/i; i++)
{
 if (n%i == 0) return false;
}
return true;

Factorial of a Number

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

Transposing A Matrix

for(i = 0; i < row; i++)
{ for(j = 0; j < col; j++)
 { System.out.print(array[i][j]+ " "); }
 System.out.println(" ");
}

Multiplying two Matrices

for (i = 0; i < row1; i++)
{ for (j = 0; j < col2; j++)
 { for (k = 0; k < row2; k++)
 { sum = sum + first[i][k]*second[k][j]; }
 multiply[i][j] = sum;
 sum = 0; } }

Java Strings

// Creating String using literal
String str1 = "Welcome";

// Creating String using new keyword
String str2 = new String("Edureka");

String Methods

str1==str2 //compare the address;
String newStr = str1.equals(str2); //compares the values
String newStr = str1.equalsIgnoreCase() //
newStr = str1.length() //calculates length
newStr = str1.charAt(1) //extract 1'th character
newStr = str1.toUpperCase() //returns string in ALL CAPS
newStr = str1.toLowerCase() //returns string in ALL LOWERCASE
newStr = str1.replace(oldVal, newVal) //search and replace
newStr = str1.trim() //trims surrounding whitespace
newStr = str1.contains("value"); //Check for the values
newStr = str1.toCharArray(); //Convert into character array
newStr = str1.isEmpty(); //Check for empty String
newStr = str1.endsWith(); //Checks if string ends with the given suffix