Methods in Java:

The action we perform to execute the logic is done by methods. Methods are of two types:

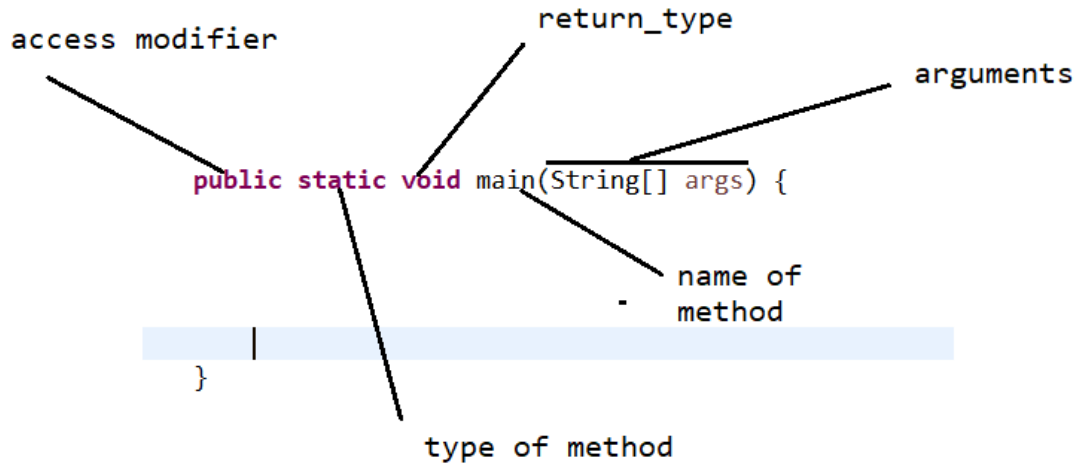
Syntax to define a method:

```
//      Syntax:
//      accessmodifier type_of_method return_type name_of_method (arguments)
//      {
//
//      }
```

a. Main method

b. Regular method

a. main method: This is a method which is responsible to decide the actual sequence of execution of java program.



b. Regular method:

There are two types of regular method:

i. static method:

ii. non static method

i. Static method:

syntax:

```
//      Syntax:
//      accessmodifier type_of_method return_type name_of_method (arguments)
//      {
//
//      }
```

- To call static method we have to call it directly by name of method or class name.method name if it is in the same class.
- To call the static method which is in the **other class** we have to call it by classname.method name.

Example:

```
public static void methodOne()
        {

                System.out.println("executing method one");


        }

public static void methodTwo()
        {

                System.out.println("executing method two");
                System.out.println("Static method");


        }


        public static void main(String[] args) {

                methodOne();

                methodTwo();

        }
```

Example: Calling of static method from different class:

```
public class StaticMethods {

        public static void methodOne()
        {
```

```
		System.out.println("executing method one");


	}

	public static void methodTwo()
	{

		System.out.println("executing method two");
		System.out.println("Static method");


	}


	public static void main(String[] args) {

		methodTwo();
		methodOne();
		Test.m1();
		methodOne();
		StaticMethods.methodTwo();

	}



}
public class Test {

	public static void m1()
	{
		System.out.println("m1 method from Test class");
	}

}
```

ii. non static method: In this method we don't use any keyword to define the type of method.

```
//	syntax:
//	access_modifier return_type name_of_method ()
//	{
//
//	}
```

- Non static method can be called only after creation of object then call that method by reference name.methodname() whether it is in the same class or different class.

```
public void m1()
	{
		System.out.println("non static m1 method");
	}

	public void m2()
	{
		System.out.println("non static m2 method");
	}




	public static void main(String[] args) {

//		object syntax:
//		classname variablename = new classname();

		NonStaticMethod p = new NonStaticMethod();

		p.m1();


		p.m2();

		NonStaticMethod varname = new NonStaticMethod();

		varname.m2();
		varname.m1();


		Test2 t2 = new Test2();

		t2.addition();
```

Execution process of java program:

- JVM start

- Locate the .class file
- Load the .class file– memory allocation to static content
- Execute the main method–memory allocation and de-allocation to the non static content
- Unload the .class file – memory de-allocation to the static content.
- JVM shutdown.

Java is nearly 100% object oriented programming language because some content can be static.

Sr. no	Static method	Non static method
1	Static keyword is used to define the static method.	No keyword is used to define the method.
2	No need of object to call the method.	Compulsorily we have to call non static method by the help of object.
3	Memory allocation gets done at the time of class loading.	Memory allocation gets done at the time of execution.
4.	It is not preferred because it doesn't follow some of the oops principles e.g. overriding in polymorphism.	It is highly preferred as it follows oops principle.
5	Performance wise we don't prefer it.	It is preferred with respect to performance.

Calling of method inside another method:

a. Calling of static method inside another static method:

example:

```
public static void m1()
	{
		System.out.println("m1 method");
	}

	public static void m2()
	{
		m1();// calling of static method inside another static method
		System.out.println("m2 method");
	}

	public static void main(String[] args) {

		m2();

		}
```

b. Calling of static method inside another non-static method:

example:

```
public static void m2()
	{
		m1();// calling of static method inside another static method
		System.out.println("m2 method");
	}


	public void m3()
	{
		System.out.println("m3 non static method");
		m2();// calling of static method inside non static method

		}
```

c. Calling of non-static method inside static method:

example:

```
public void m1()
	{
		System.out.println("m1 method");
	}

	public static void m2()
	{
		CallingOfNonStaticMethod refname = new CallingOfNonStaticMethod();
		refname.m1();// Calling of non static method inside static method
```

```
}

public static void main(String[] args) {

        CallingOfNonStaticMethod var = new CallingOfNonStaticMethod();
        var.m1();

}
```

d. Calling of non-static method inside another non-static method:

- If both methods are in the same class: We don't need to create an object in the method in which are going to call the another one. We can call it directly by method name.
- If both methods are not in the same class: We have to create an object to call the method which is available in other class.

  Example:

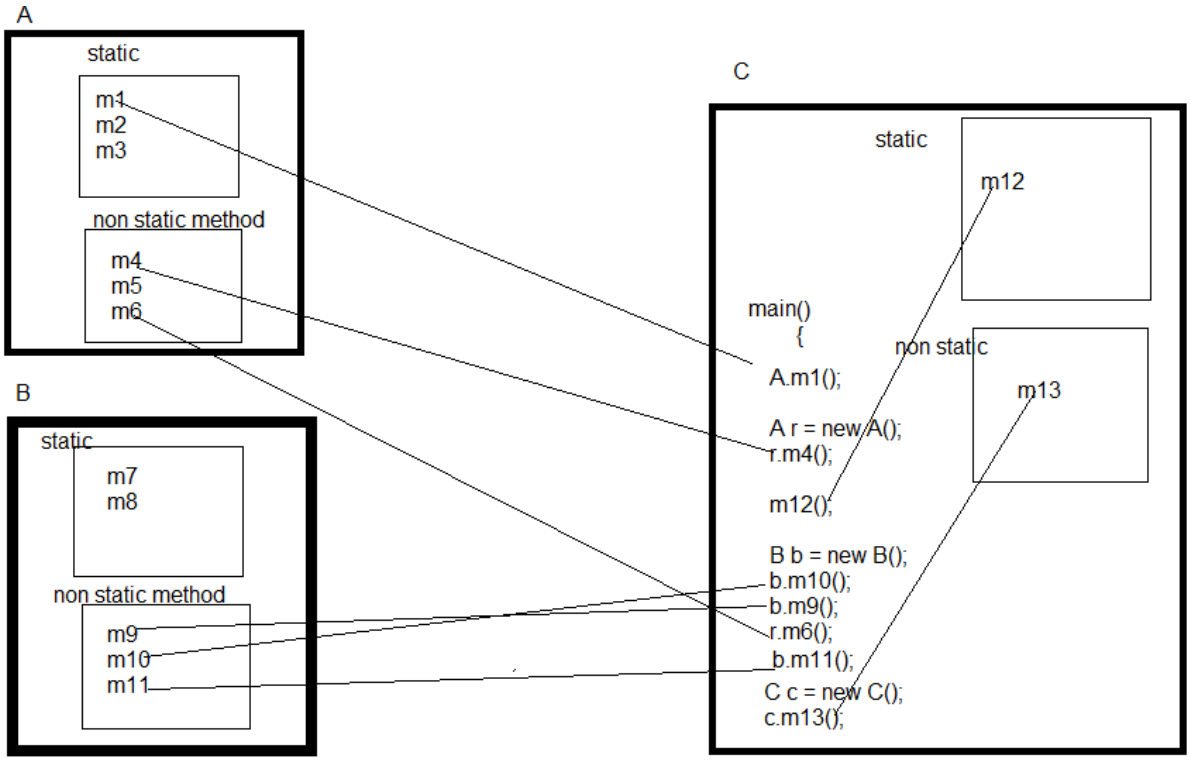
```
public class CallingOfStaticMethod {


        public void m4()
        {
                System.out.println("m4 method");
                        }


                public class CallingOfNonStaticMethod {

public void m3()
        {
                m1();// calling of non static method which is in the same class
                CallingOfStaticMethod cosm = new CallingOfStaticMethod();
                cosm.m4();// calling of non static method which is in another class

                        }
```



Categories of methods:

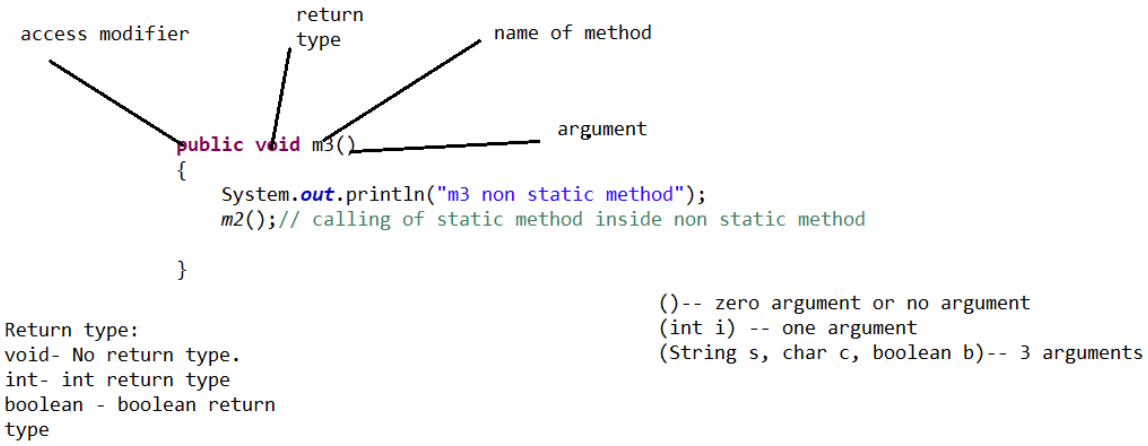
Categories are defined for a method irrespective of their type(main, static, non static). There are 4 categories of method.

a. method with no return type and no argument.

b. method with no return type and with argument.

c. method with return type and no argument.

d. Method with return type and with argument.



a. method with no return and no argument:

```
// a method with no return and no argument

public static void m1()
{
	System.out.println("method with no return and no argument");
}

public void m2()
{
	System.out.println("method with no return and no argument");
	}
```

b. method with no return and with argument: A method can have any number of arguments in it. But those arguments should have data type and their variables.

Example

```
//	b method with no return and with argument

public static void m3(int a, int b)
{
	System.out.println(a);
```

```
        System.out.println(b);
    }

    public static void add(int i, int j)
    {
        int k= i+j;

        System.out.println(k);
        System.out.println("now executing m3 method");
        m3(50, 80);
    }



    public static void main(String[] args) {

        m3(50, 10);

        m3(80, 20);
        add(10, 20);

        add(10, 10);
    }
```

Output:

```
50
10
80
20
30
now executing m3 method
50
80
20
now executing m3 method
50
```

c. // c. method with return type and no argument

```
	public static int m4()
	{
		System.out.println("method with return type and with argument");

		return 100;

	}

	public String m5()
	{
		String s1 = "corporate";

		System.out.println(s1);

		return "Velocity";
	}

public static void main(String[] args) {

		int k = m4();

		System.out.println(k);

		int l= k+2;

		System.out.println(l);


		CategoriesOfMethods com = new CategoriesOfMethods();
		String h = com.m5();
		System.out.println(h);

	}
```

Output:

```
method with return type and with argument
100
102
corporate
        Velocity
```

d. method with return and with argument:

d. method with return and with argument

```
        public static int m6(String s1, int i)
        {

                s1 = s1+"city";

                System.out.println("value of s1 is "+s1);

                i  = i+2;

                System.out.println("Value of i is "+i);

                return i;


                }
        public static void main(String[] args) {
System.out.println(m6("pune", 50));


                int w = m6("Bengaluru", 100);


                        System.out.println(w);
```

```
}
```

Output:

```
value of s1 is punecity
Value of i is 52
52
value of s1 is Bengalurucity
Value of i is 102
102
```

Usage of categories of method:

Whenever we have to the output of a method in future execution then we should go for method with return type.

Whenever we have to execute the logic with different set of values then we have to go for method with arguments.