Methods

There are four different types of methods

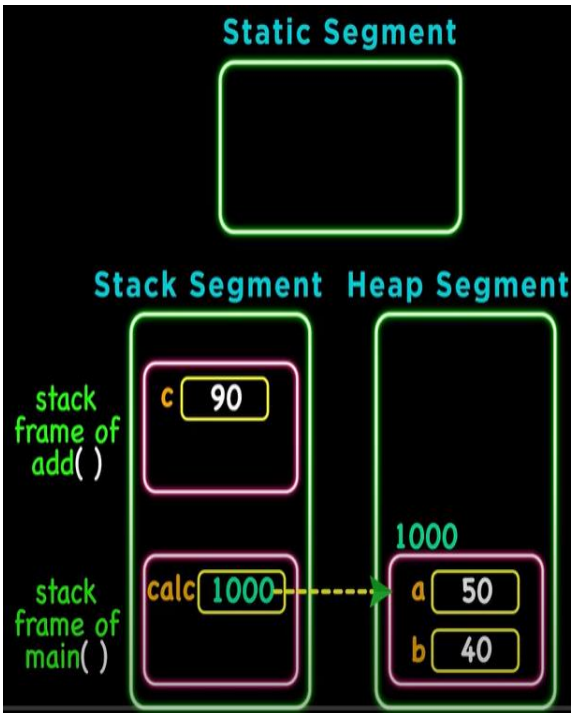
- Without Input and without Output
- With Input and without output
- Without Input and with output
- With input and with output

Case-1: Without input and without output

Code Segment

```
class Calculator {
	int a = 50;
	int b = 40;

	void add()
	{
		int c = a + b;
		System.out.println(c);
	}
	public static void main(String args[]) {
		Calculator calc = new Calculator();
		calc.add();
	}
}
```



Output:

30

Explanation:

Here, the execution starts from the main method() which is called by the Operating System. Whenever, a method is called a region is created in the stack segment called ***Stack frame****. And therefore, the stack frame of* ***main()*** *gets created on the stack segment.*

*By using a "****new****" keyword an object is created and memory for it is allocated in the heap segment. The instance variable* ***a and b*** *is allocated memory in the heap segment, local variable* ***c*** *allocated is memory on stack segment in stack frame and default values are given*

to instance variables by the JVM. A reference variable is created with name ***c*** *and is created in Stack segment.*

Now, ***add()*** *is a method that is executing. This method add() is called and the stack frame of add() is created in the Stack segment. Then, the body of add() is executed, now this method adds two values and is collected in* ***c*** *value and control goes back to the caller of the method.*

Case-2: With input and without output

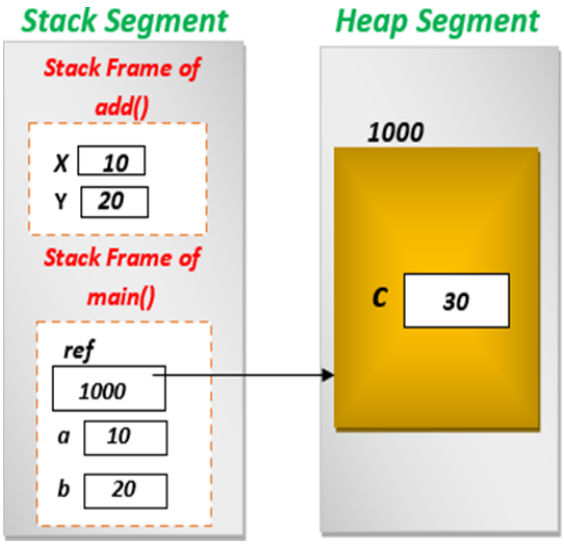
Code Segment

```
class Addition
{
    int c;

    void add(int x,int y)
    {
        c = x + y;
        System.out.println(c);
    }
}

class Demo
{
    public static void main(String[] args)
    {
        Addition ref = new Addition();
        int a,b;
        a = 10;
        b = 20;
        ref.add(a,b);
    }
}
```

Static Segment



Output:

30

Explanation:

Here, the execution starts from the main method() which is called by the Operating System. Whenever, a method is called a region is created in the stack segment called ***Stack frame****. And therefore, the stack frame of* ***main()*** *gets created on the stack segment.*

*By using a "**new**" keyword an object is created and memory for it is allocated in the heap segment. The instance variable **c** is allocated memory in the heap segment, local variables **x,y,a,b** are allocated memory on the stack segment on their respective stack frames and default values are given to instance variables by the JVM. A reference variable is created with name **ref** and is created in Stack segment.*
*Now, **add()** is a method which accepts two parameters as inputs. This method add() is called and the stack frame of add() is created in the Stack segment. Then, the body of add() is executed, now this doesn't return any value hence, control goes back to the caller of the method.*

Case-3: Without input and with output

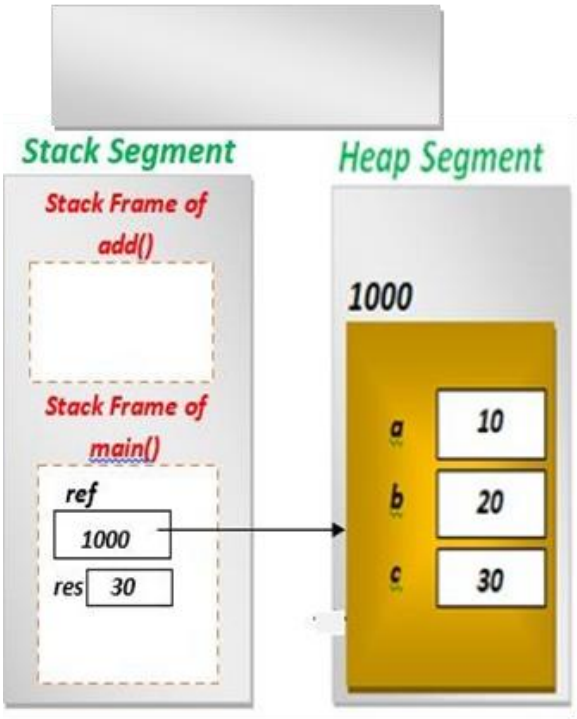
Code Segment

```
class Addition
{
    int a,b,c;

    int add()
    {
        a = 10;
        b = 20;
        c = a + b;
        return c;
    }
}

class Demo
{
    public static void main(String[] args)
    {
        Addition ref = new Addition();
        int res;
        res = ref.add();
        System.out.println(res);
    }
}
```

Static Segment



Output:

30

Explanation:

*Here, the execution starts from main method() which is called by the Operating System. Whenever, a method is called a region is created in the stack segment called **Stack frame**. And therefore, stack frame of **main()** gets created on the stack segment.*
*By using a "**new**" keyword an object is created and memory for it is allocated in the heap segment. The instance variable **a,b,c** are allocated memory in the heap segment, local variable **res** allocated is memory on stack segment in stack frame of main() and default*

*values are given to intsnace variables by the JVM. A reference variable is created with name **ref** and is created in Stack segment.*
*Now, **add()** is a method which accepts 0 parameters as inputs. This method add() is called and stack frame of add() is created in the Stack segment. Then, the body of add() is executed, now this method return **c** value which is collected in res in main() and control goes back to the caller of the method.*

Case-4: With input and with output

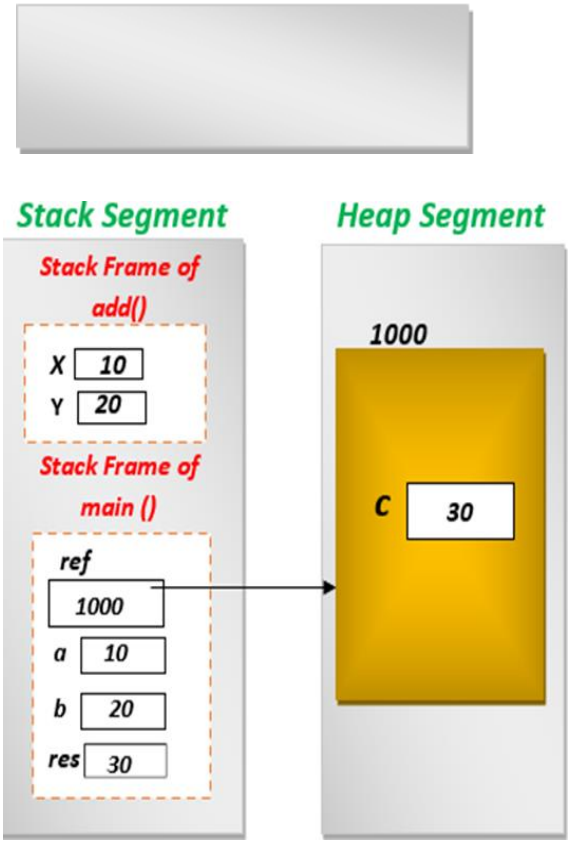
Code Segment

```
class Addition
{
    int c;

    int add(int x,int y)
    {
        c = x + y;
        return c;
    }
}

class Demo
{
    public static void main(String[] args)
    {
        Addition ref = new Addition();
        int a,b,res;
        a = 10;
        b = 20;
        res = ref.add(a,b);
        System.out.println(res);
    }
}
```

Static Segment



Output:

30

Explanation:

*Here, the execution starts from the main method() which is called by the Operating System. Whenever, a method is called a region is created in the stack segment called **Stack frame**. And therefore, the stack frame of **main()** gets created on the stack segment.*

*By using a "**new**" keyword an object is created and memory for it is allocated in the heap segment. The instance variable **c** is allocated memory in the heap segment, local variable **a,b,x,y,res** allocated is memory on stack segment in stack frame and default values are given to intsnace variables by the JVM. A reference variable is created with name **ref** and is created in Stack segment.*

*Now, **add()** is a method which accepts 2 parameters as inputs. This method add() is called and stack frame of add() is created in the Stack segment. Then, the body of add() is executed, now this method return **c** value which is collected in res in main() and control goes back to the caller of the method.*