#Variable

A Variable is the name of memory location. There are three types of variables in java:

- Local Variable
- instance Variable
- Static Variable

1. Local Variable:

A variable declared inside the body of the method is called local Variable

Local Variable is declared inside method, Constructor or in Block.

2. Instance Variable

A Variable that declared inside the class but outside any method that is called instance Variable.

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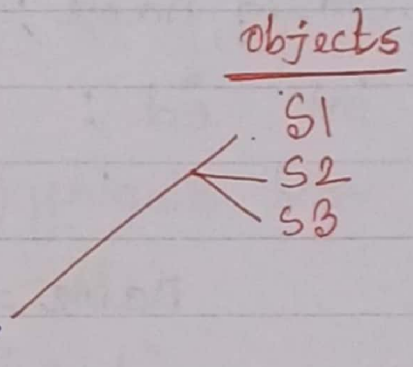
✱ Static Keyword

The Static Keyword is mainly used for memory management. The Static Keyword is used to share the same variable or method of a given class. The Static Keyword is used for a constant variable or a method that is the same for every instance of a class.

Example :

```
Class Student {
    String name;
    int id;
    static String UniversityName;
}
```



Characteristics of Static keyword

- Shared Memory Allocation
- Accessible Without object instantiation
- Associated with Class, not objects.
- Cannot access non-Static members

Static can be -

1. Static Variable
2. Static Method
3. Static Block
4. Nested Class.

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Static Variable

When a variable is declared as static, then a single copy of the variable is created and shared among all objects at the class level.

Code:

```
public class Example{
    Static String universityName = "LU";
    String name;
    int id;
    void display(int n, String s){
        name = s;
        id = n;
    }   SOP(name + " " + id);
}
public class Test{
    public Static void main (String args[]){
        Example s1 = new Example();
        SOP(Example.universityName);
        s1.display(15, "Amen");
    }
}
```


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Static Method

When a member is declared with the Static keyword, it is known as the Static method. The most common example of static method is the main() method.

Methods declared as Static have several restrictions:

- They can only directly call other Static methods.
- They can only directly access Static data
- They cannot refer to this or super in any way.

Code:

```
public Class Calculate {
        Static int cube(int x){
            return x * x * x;
        }
        static int a = 10;
        int b = 5;
        Static void access(){
            a = 20;
            b = 10; // Compilation error.
        }
}
public class Test {
        public Static void main (String args[]){
            int result = Calculate.cube(7);
            SOP(result);
        }
}
```

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Q. Why is the java main method static?

⇒ It is because the object is not required to call a static method. If it were a non-static method, JVM creates an object first then call main() method that will lead the problem of extra memory allocation.

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Static Block

- It used to initialize the static data member.
- It is executed before the main method at the time of classloading.

Code:

```
class Test {
    static {
        System.out.println("Static block is invoked");
    }
    public static void main(String args[]){
        System.out.println("Hello Main");
    }
}
```

Output:

Static block is invoked.
Hello Main.

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This Keyword

this is a reference variable that refers to the current object on which method or Constructor is being invoked. It can be used to access instance variables and methods of the current object

Code :

```
public class Person{
        String name;
        int id;
        person(String name, int id){
            this.name = name;
            this.id = id;
        }
        public void Display()
        {
            SOPln(this.name);
            SOPln(this.id);
        }
        public static void main(String args[])
    {   person P1 = new person("Roni", 42);
        P1.Display();
    }
}
```

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