**Class 11 object and class topic date: 04-03-2024**

**What is oops?????**

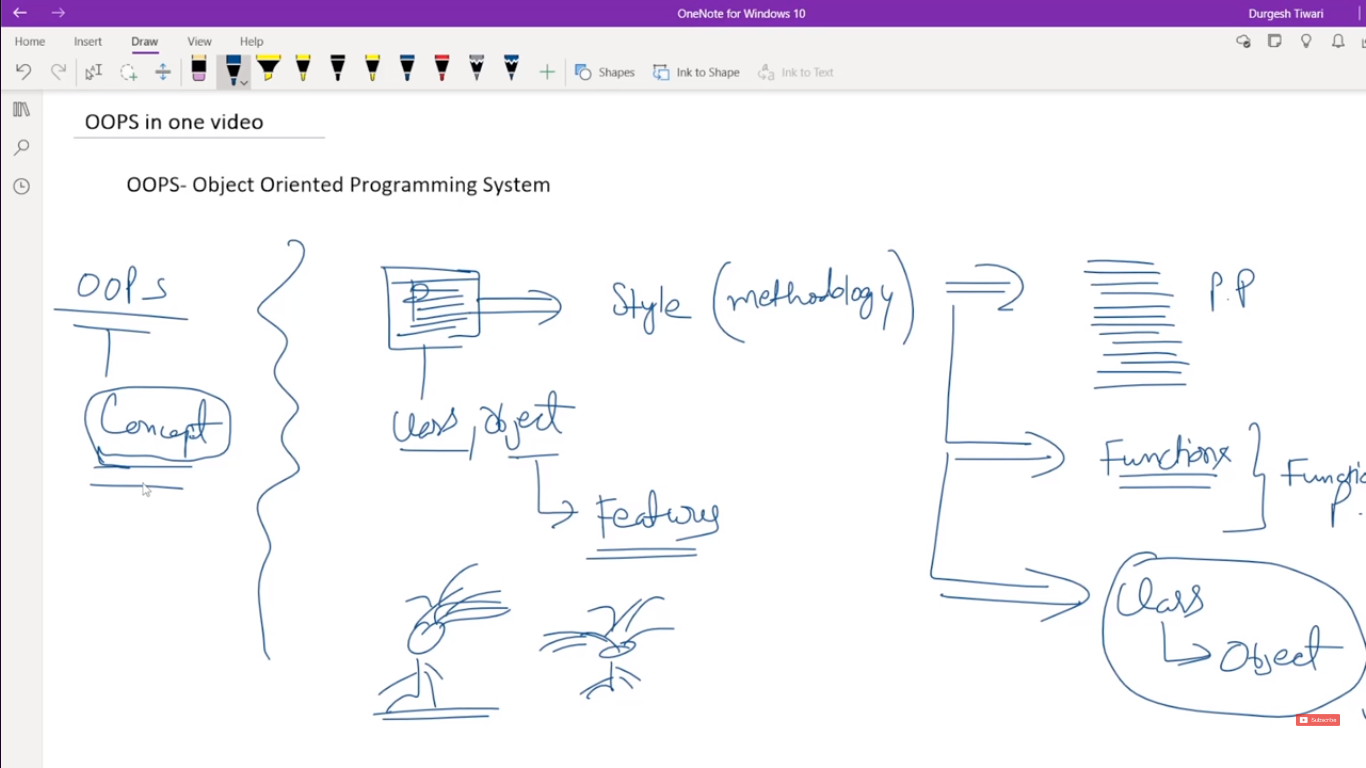
Suppose you say to a person please write a code, this is his own style how he write the code.

**Oops is a style of writing code, is a methodology of code writing, is a set of rules, set of guidelines to write a code.**

1. if a person writes procedure step by step this is called procedural programming

2. if a person writes a code using functions this is called functional programming

3. if a person write code using class and object this is called oops programming.



**What is class and object???**

**Class; is a blueprint, dye, sketch plan, idea to create an object.**

suppose a person want to build a car, he directly cannot build a car , first he take hammer, iron, spare parts and then will make the car. This will not happen, first he has to plan what and how he will build the car or any other thing.

is a logical entity. Plan in your mind, or drawing on paper, not touch able.

Class is plan, idea, paper work to design anything.

Class will have data/properties/variables/attributes

Class will also have behavior/what thing will behave how.

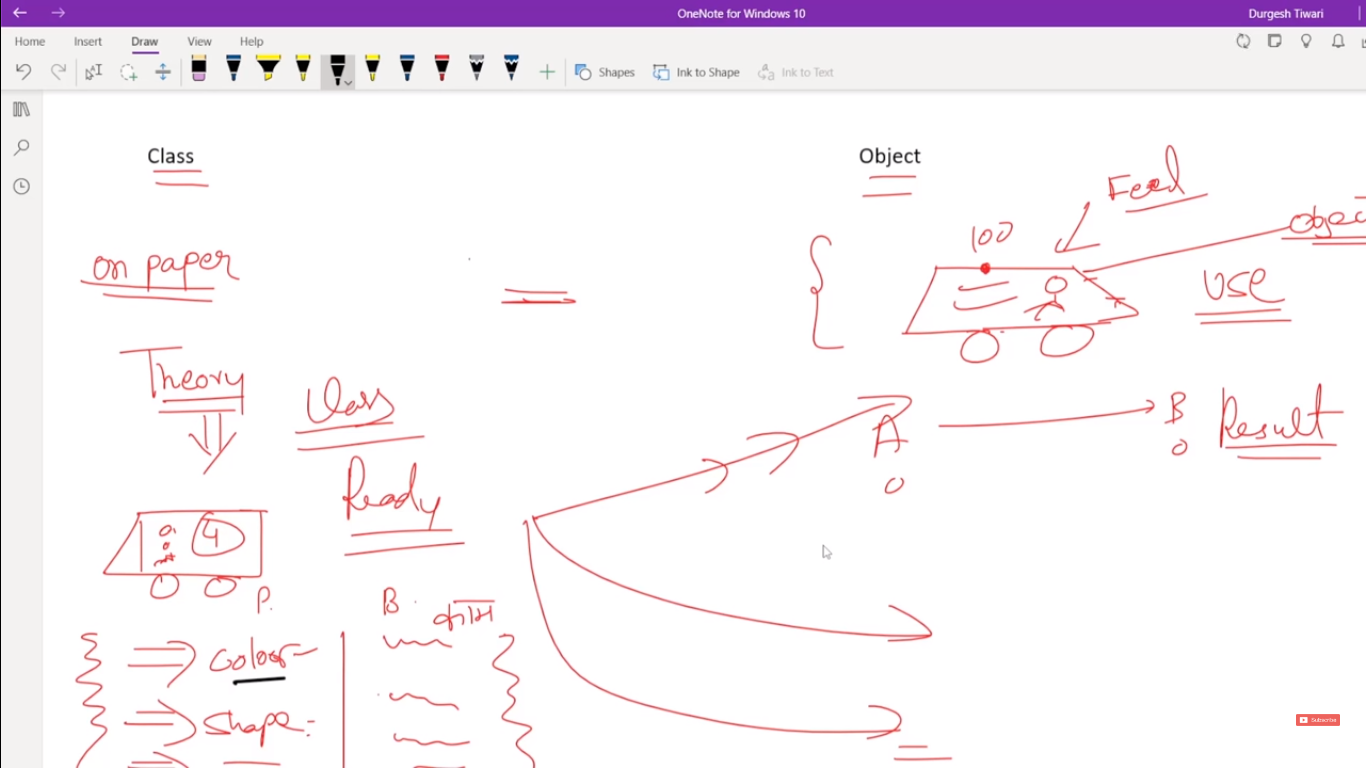
**Object**

an object is an instance of a class. object is the physical implementation of class. . Instance mean hawala(urdu hawala ,missal, namona )

object is the physical construction of a car. Object is also called instance of a class.

Object will have all the properties and behaviors from the class.

Creating an instance of a class mean creating object of that class.



If there is no import inside the package then java will check that class

**void** return type means that it doesn't return any value. It simply performs some action or task, but doesn't produce a result that can be used in further computations or assignments.

**System.out.println()** is a non-return method, this is a void method.

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**CLASS 12 JAVA TOPIC STRING METHODS**

**What is a method???** Collection of statement , grouped to gather to perform task or operation

**What is mean calling a method??**

Calling a method in Java means invoking or executing the code that is defined within that method.

Types of methods???

Return type

And non return type

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Built in method

User defined method

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Method with parameter

Method without parameter

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If a method is return-type then its value can be stored inside the variable. And can be used for further calculation.

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**What is method signature??** Name of method and parameter types.

**What is method body??** The method body contains a collection of statements that define what the method does.

**What is method header??**

The method header in Java consists of the method's signature along with any modifiers.

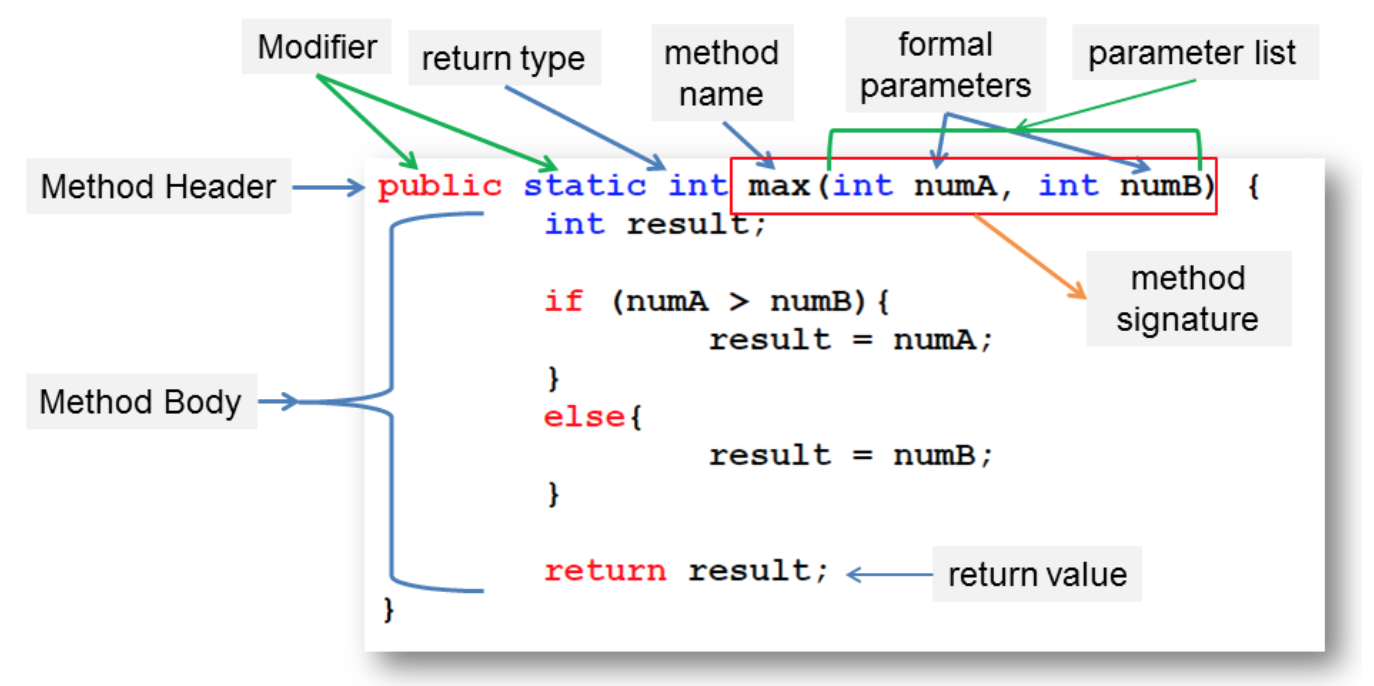
Parameters are enclosed within parentheses **()**, and if a method does not accept any parameters, the parentheses will be empty.

**What is a parameter???** define a variable inside the method.

**What is argument??** Assigning the value to the variables is present in signature called argument.

**What is parametrized method??** a method that contains variable in its signature called parameterized method.

**What is non parametrized method???** the method which do not contains variable in its signature.



**What is a prime number??**

Prime numbers are natural numbers greater than 1 that have no divisors other than 1 and themselves.

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================================================================================================================================================================================================================================================================================================================================**JAVA CLASS NUMBER 13 STRING METHODS**

**What is string???** is a class designed to store alphabets(A,B,C) symbol@#$) numbers(123) in the form of group.

It is a data type used to represent text rather than numeric data.

String are objects. every string that you create is actually an object of type String class.

**What is data type???** which type of value a variable can hold and what type of operations can be performed on it.

**What are String methods???** In Java, the **String** class provides a wide range of methods to manipulate and work with strings. Here are some of the commonly used methods of the **String** class:

1. **Str.charAt(4);** this method tell at which index which character is present String str=”Batch 11 is awesome”;
2. **toCharArray();** this method converts string into an array of char. Char [] val=str.toCharArray();
3. **length method**; gives total number of character inside the string or array or array list.
4. **Length()-1** it will print last character from an array , because it starts from zero.
5. **String toLowerCase** method converts into small alphabets
6. **Strong toUpperCase** converts the string into upper case letter
7. **indexOf(“B”)** of method tell the index number of any character.
8. **Sub-String method**. It gives the substring/small string of original string. If you will put two value (0, 5) it will print only up to 5 characters, but if you will put (5) it will print all values from 5 to last character. This is very important.
9. **Replace method;** it takes two arguments, first the string which you want to replace, second the word which will be replace old word with new word.
10. **Trim method** will remove spaces before and after of the string.

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**Regex methods;**

**Replace all method;** is used to replace each part of the string that matches with a specific pattern according to the given regular expression.

1. **Split(); method. is used to convert string into and array of string.split the string into many strings and store them inside the array.**
2. **Arrays.toString method is used to convert an array into a string.**
3. int[] array = {1, 2, 3, 4, 5};
4. String string = Arrays.toString(array);
5. System.out.println(string);

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**What is difference in replace and replace all method??**

**Replace method just replace old string with new string**

**Replace all method replace all string with matching pattern.**

**What is regex regular expression???** It's a sequence of characters that define a search pattern. regex is used for matching the patterns in strings.

A search pattern is like a secret code that helps you find specific pieces of information within a larger text.

**What is method chaining??** When multiple string methods are called/written in one line this is called chaining this is only possible in strings.

**What is concatenation???** **Concatenation**: combining two or more strings into a single string. This is typically done using the concatenation operator **+**

Increment operator.

**Count++; mean is ------ count = count + 1;**

**!=** is used for inequality comparison,

while **==** is used for equality comparison in Java.

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**JAVA CLASS 14 REGULAR EXPRESSION STRING BUILDER**

**String methods**

13. **starts with method**; it return Boolean , if a string starts with first letter.

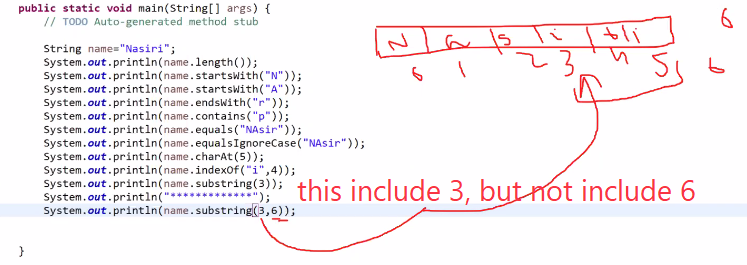
14. **ends with method**; it gives Boolean

15. **contains method**. it tells that a string contains a character or not.

16.**Equals method**; it will check string is equal or not case sensitive.

17.**equalsIgnorecase**; it will ignore the upper and lower case of string

18.String val=**ArraytoString(str); this method convert an arrays into string. You can print all elements from an array without using any loop.**



**To check the performance of any software, check two things??**

1. how much memory it taking

2. how much time it taking to process your request.

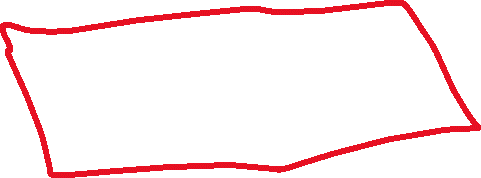
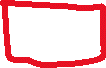
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String and string object are same, when you create a string actually you create object of string class.

**How string works internally, how strings are immutable/unchangeable/unmodifiable???**

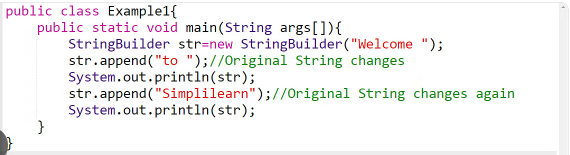
Once a string object is created its data or state can't be changed internally in memory. but if you have different values in string then a new memory for string object is created for new data.

**What is string builder??** The StringBuilder class in java is same as String class except it is mutable i.e. it can be changed.

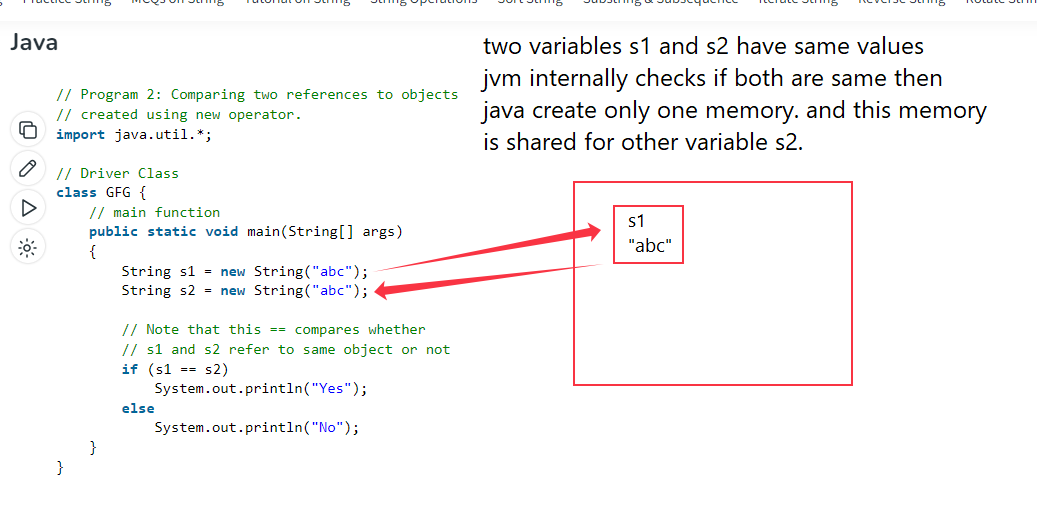


change able memory for each variable.

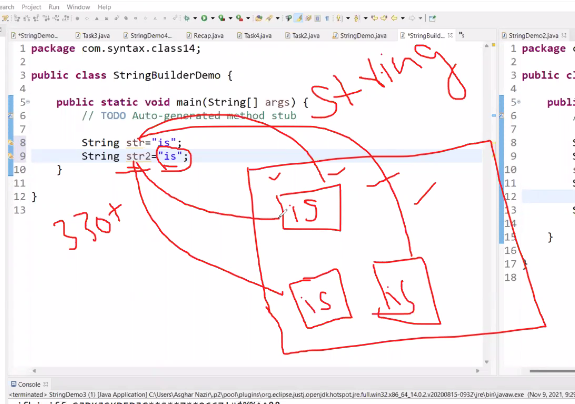




Whenever we create a new string object or string variable, JVM checks for the presence of the object in the memory, If String is available in the memory, then same object reference is shared with the variable, else a new object is created.







**When we have to use strings??**

1. when you need to save memory.

2. but its performance will slow, searching time

**When you want to use String builder???**

1. when you want to need performance , java will not search that already a variable present or not.

2. new memory will be created for every variable a lot of memory will consume.

String Builder class methods are very important.

1**. reverse method();**

**2.insert method(index 5, “hello”);**

**3. delete method (index 4, 6)** --- at index 4 which it will be deleted, 6 will not include here

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**JAVA CLASS 15 TOPIC ; TYPES OF VARIABLE**

**How many types of variables are there??**

**1. what are instance variable----** **They are accessed using the reference variable to the object.**

**2. what are local variable – access modifier can not be used with local variables. Nor static.**

**3. what are static variable -- class level variables because they don’t belong to objects.**

Static variables and methods are accessed using the class name itself.

**Static variable can-not create inside the method**

**Non static variable can-not be called inside static method.**

Static variables used when you share the values across all objects

Instance variables are used when you share the values across all the methods.

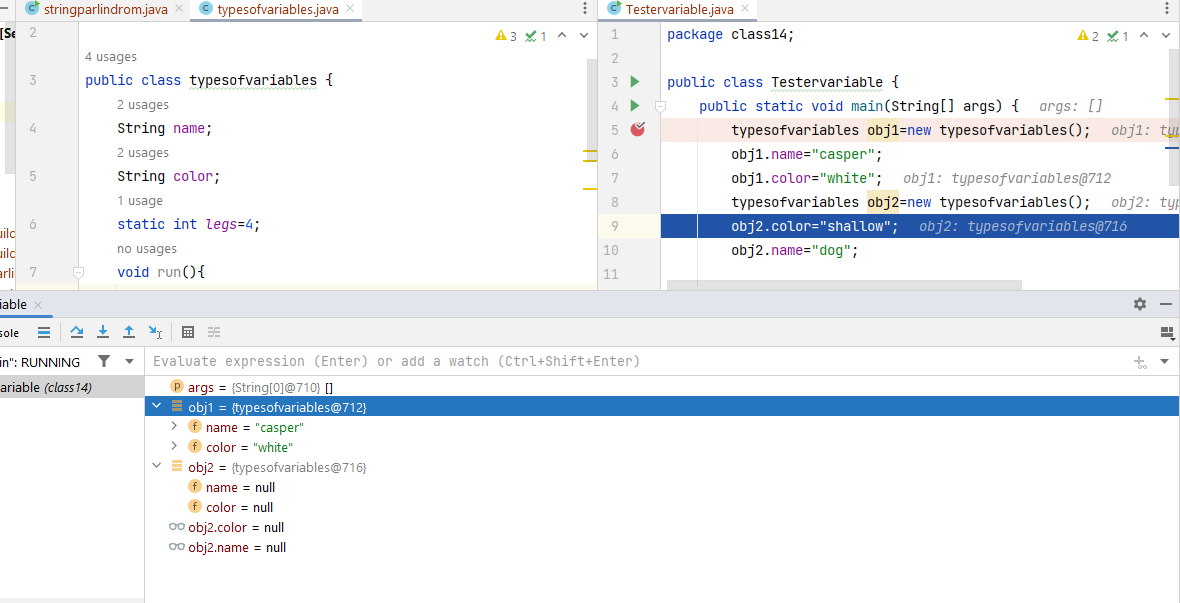
**When we should use instance variables**?? When you want share one thing in many methods in a class.

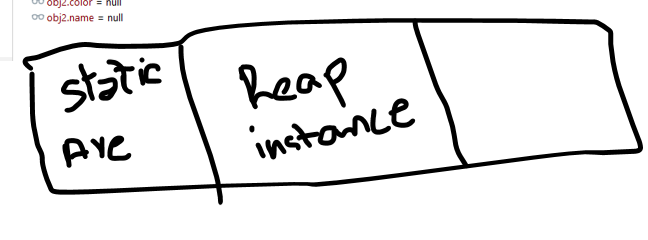
**Why we should not use instance variable**?? Because they occupy memory even after execution.

**When you use local variables??** Always use inside the method**.**

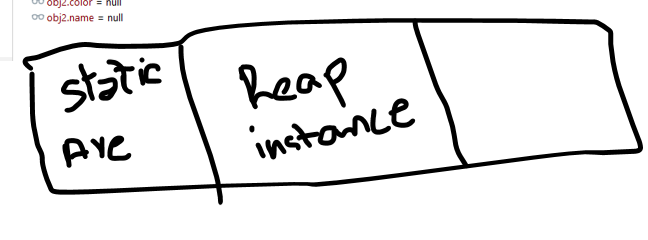
**For instance variables a separate copy is created for each object inside the heap memory.**

**But for static there is no separate copy is created. just one memory created and it shared for all the objects and methods.**

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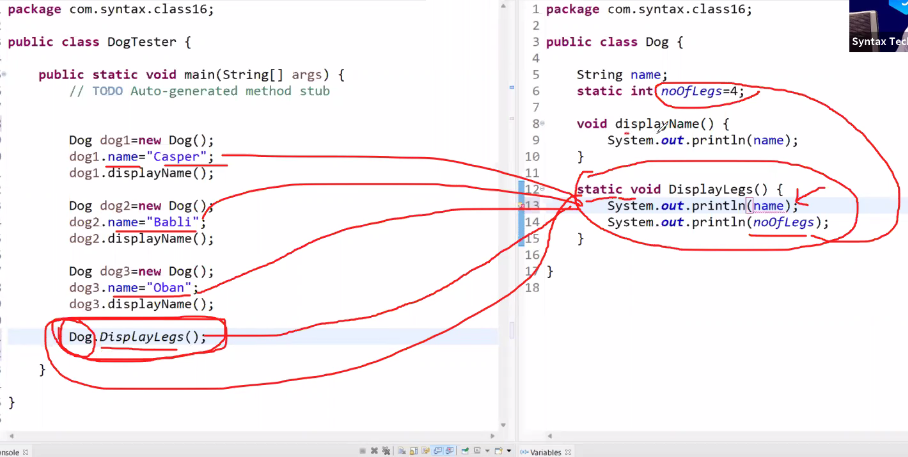
**JAVA CLASS 16**

Declare a variable int age;

Defining a variable and initialize int age=23;

Initializing the variable int age=0;

Assigning a value age=20;



Instance variables and instance methods mean belongs to objects,

Class level variables and methods mean belong to class. Can be called only with class name.

**Why instance variable can-not be called inside the static method???**

Because java is confused each object has different value for instance variable which value I have to use.

**Why non static method can-not be called inside the static method??**

Because each instance method will having must instance variables , and instance variables can-not be called inside the static method, that’s why non static method can-not be called inside the static method.

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**Scenario; instance variables belongs to object , each object has separate copy of instance variables, if there are thousands of objects of a class, each object will have different value of instance variable, when you will call an instance variable inside the static method, java will confused from which object I have to take value of instance variable because there are thousands of objects and there values.**

Instance methods mean they belongs with object. You can only call then just by creating object of a class. That’s why they belong with object.

Java knows static variable has only one copy, it can call inside any method. in this case java will not be confused.

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**What are access modifier??**

Access modifiers are keywords that are used to control the visibility/accessibility of variables, methods and constructors in a class. --- class can have only two access modifier public, default.

The four access modifiers in Java are

* private = member accessible only within the same class in which private created. Not even subclass
* default = member it is accessible only within the same package, not accessible in another package.
* protected = member is accessible for sub classes, present inside the package.
* public =member is accessible inside all the packages present inside the project.

**What are no- access modifiers??**

Non-access modifiers provide information about the characteristics of a class, method, or variable to the JVM.

Seven types of non-Access modifiers are present in Java. We will study only 3.

1. [static](https://www.geeksforgeeks.org/static-keyword-java/)
2. [final](https://www.geeksforgeeks.org/final-keyword-java/)
3. abstract
4. [synchronized](https://www.geeksforgeeks.org/synchronized-in-java/)
5. [transient](https://www.geeksforgeeks.org/transient-keyword-java/)
6. [volatile](https://www.geeksforgeeks.org/volatile-keyword-in-java/)
7. [native](https://www.geeksforgeeks.org/native-keyword-java/)

**Class and Interface cannot be declared as private**

If a class has private constructor, then you cannot create the object of that class from outside of the class

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**JAVA CLASS TOPIC – CONSTRUCTORS IN JAVA. 08-03-2024**

With methods always use public keyword,

With variables always use private keyword in practice;

**What is constructor???**

constructor is a special type of method which is used to initialize the object.

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* Constructors have the same name as the class and do not have a return type, not even **void**.
* Constructors are automatically invoked when an object is created using the **new** keyword, while regular methods are called explicitly by name.
* Constructors have the same name as the class they belong to, while regular methods can have any name.

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**What is default constructor???**

The constructor which initializes the object's variables to their default values.

Default constructors are often called as "no-argument" or "zero-argument" constructors.

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**What is the purpose of constructor???**

If There is a class, where must object will be created to access the code inside the class.

And constructor control the access of class, if you want to create object you must initialize the variable first then you will access the whole class otherwise not.

Encapsulation. Constructor provide the control on class using.

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**To initialize an object there are many methods in java. We will use only one constructor.**

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1. initialize by instance variables ---instance variable is assigned values inside the class

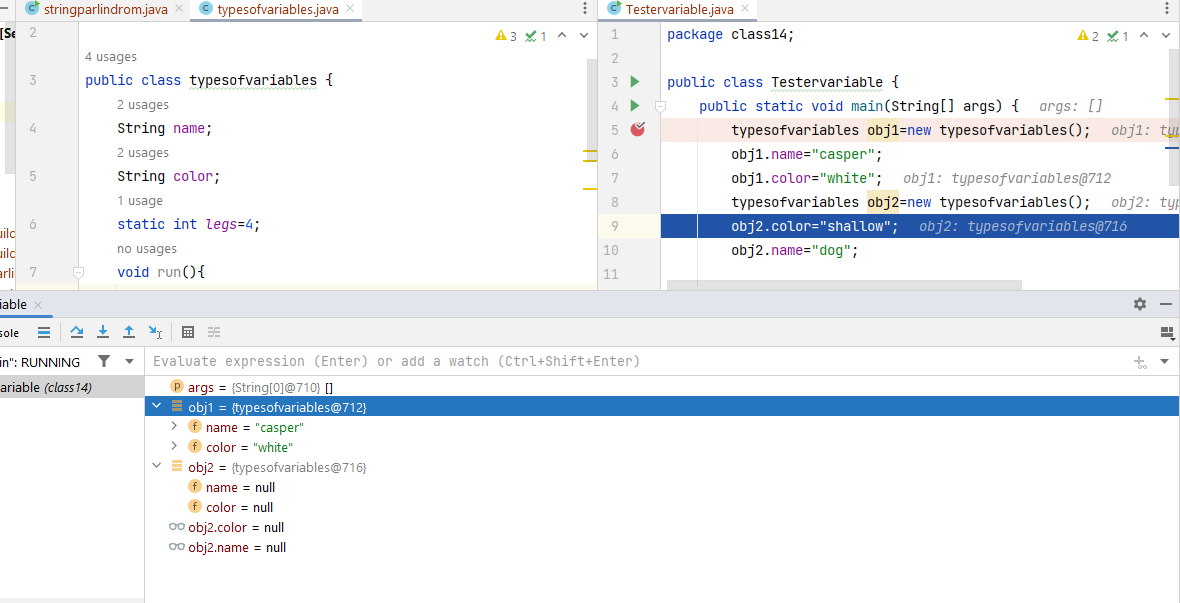
2. initialize by object itself-----instance variable is assigned value by creating object reference

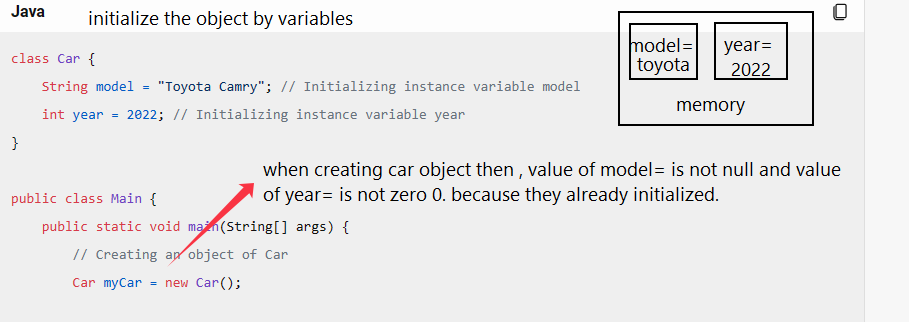
3.initialize by methods-----methods with parameters---- remember this.

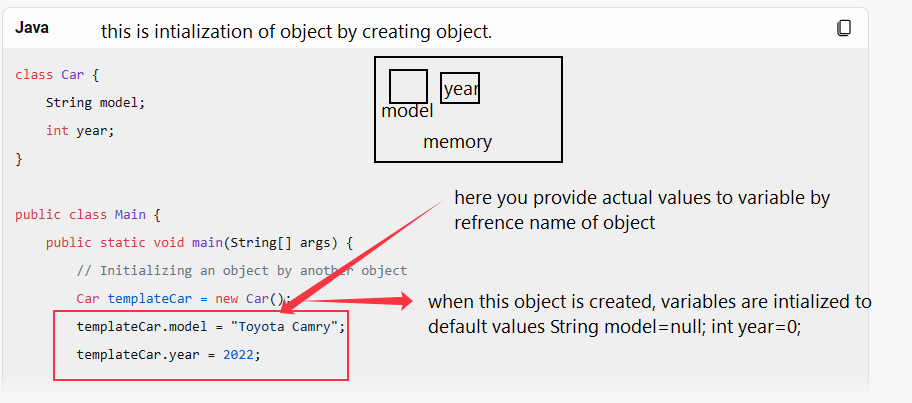
4. initialize by constructor.---by using constructor.

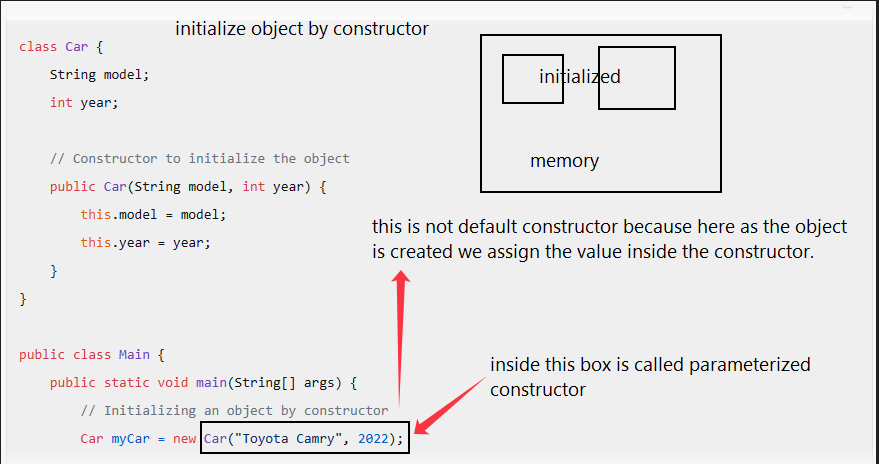
**The best practice to initialize**

object is by constructor only. others way occupy extra memory.

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**Definition: Declaring a variable means specifying its data type and name.**

**Defining and initialize are same.**

**Definition: Defining a variable means assigning a value to it for the first time.**

**What is initialize??** the process of assigning initial value to a variable is called initialize variable.

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If you don't define any constructor in your class, Java provides a default constructor automatically. This default constructor initializes instance variables to their default values (e.g., **null** for reference types, **0** for numeric types, **false** for boolean).

If you define any constructor (with arguments) in your class but don't define a no-arg constructor explicitly, Java won't provide a default constructor automatically. In this case, if you attempt to create an object using the default constructor syntax (e.g., **new MyClass()**), a compilation error will occur.

**If we don’t provide default constructor and just create constructor, why java gives error??**

This is because Java only provides the default constructor if you don't define any constructors at all. If you define any constructors explicitly,

Java expects you to use one of those constructors for object creation.

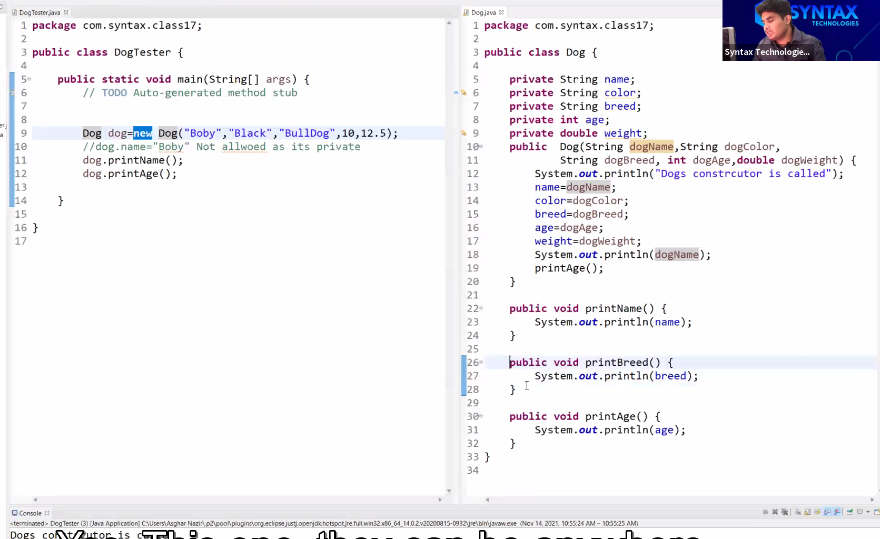
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A method can be called inside the constructor

A constructor can be called inside the method.

Every action you can perform with constructor as you perform with methods.

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**Types of constructors??**

**1. What is parametrized constructor??** a method that contains variable in its signature called parameterized method.

**2. What is non parametrized constructor???** the method which do not contains variable in its signature.

**How generate constructor automatically??**

**Write click, select option, generate >>constructor**

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**“This” keyword is used to differentiate between instance variables and local variables that have the same name.**

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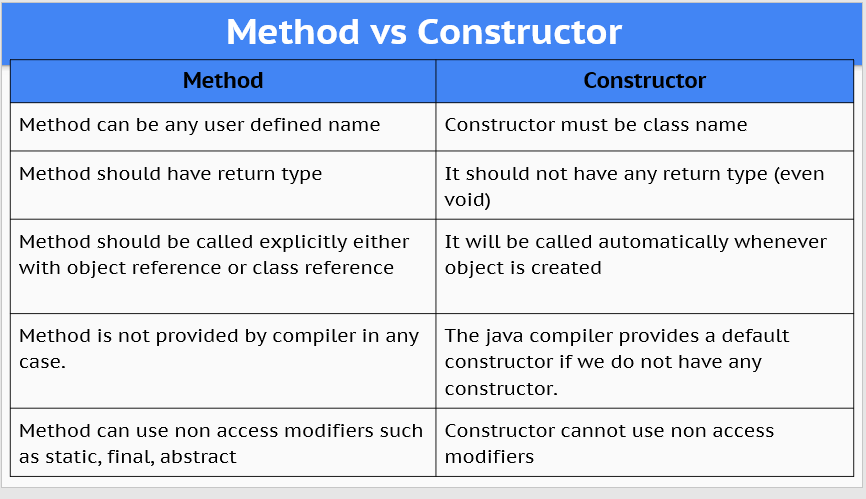
**This();**

**The constructors provide flexibility in object creation, allowing different combinations of parameters to be used for initialization.**

**This allows users to initialize objects of the class in various ways, depending on which attributes they want to specify during object creation.**

**Why constructor can be static??**

**Because static method and static constructor can-not access the non-static variables.**

**Top of Form**