Department:- BCA
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Subject:- JAVA(5th sem.
Topic:-Class and Object

OOPs:-

OOPs stands for Object-Oriented Programming. OOPs is a programming paradigm or methodology. We can design a program using objects and classes. **Smalltalk** is considered the first truly object-oriented programming language. The popular object-oriented languages are Java, C#, PHP, Python, C++, etc.

OOPs striking features:-

- **Class**
- **Object and Methods**
- **Inheritance**
- **Polymorphism**
- **Abstraction**
- **Encapsulation**

Class:-A class is a user defined blueprint or prototype from which objects are created. It represents the set of properties or methods that are common to all objects of one type. In general, class declarations can include these components, in order:-

1. **Modifiers** : A class can be public or has default access.
2. **Class name:** The name should begin with a initial letter (capitalized by convention).
3. **Superclass (if any):** The name of the class's parent (superclass), if any, preceded by the keyword extends. A class can only extend (subclass) one parent.
4. **Interfaces (if any):** A comma-separated list of interfaces implemented by the class, if any, preceded by the keyword implements. A class can implement more than one interface.
5. **Body:** The class body surrounded by braces, { }.

Note:- Constructors are used for initializing new objects.

Syntax:-

<access_modifier> class <class_name>

{

field_declaration;

method_declaration;

}

Object:-It is a basic unit of Object Oriented Programming and represents the real life entities. A typical Java program creates many objects, which as we know, interact by invoking methods.

- An object is a real-world entity.
- An object is a runtime entity.
- The object is an entity which has state and behavior.
- The object is an instance of a class.

An object has three characteristics:-

1. **State :** It is represented by attributes of an object. It also reflects the properties of an object.
2. **Behavior :** It is represented by methods of an object. It also reflects the response of an object with other objects.
3. **Identity :** It gives a unique name to an object and enables one object to interact with other objects. it is used internally by the **JVM** to identify each object uniquely.

Declaring Object :- When an object of a class is created, the class is said to be **instantiated**. All the instances share the attributes and the behavior of the class. But the values of those attributes, i.e. the state are unique for each object. A single class may have any number of instances.

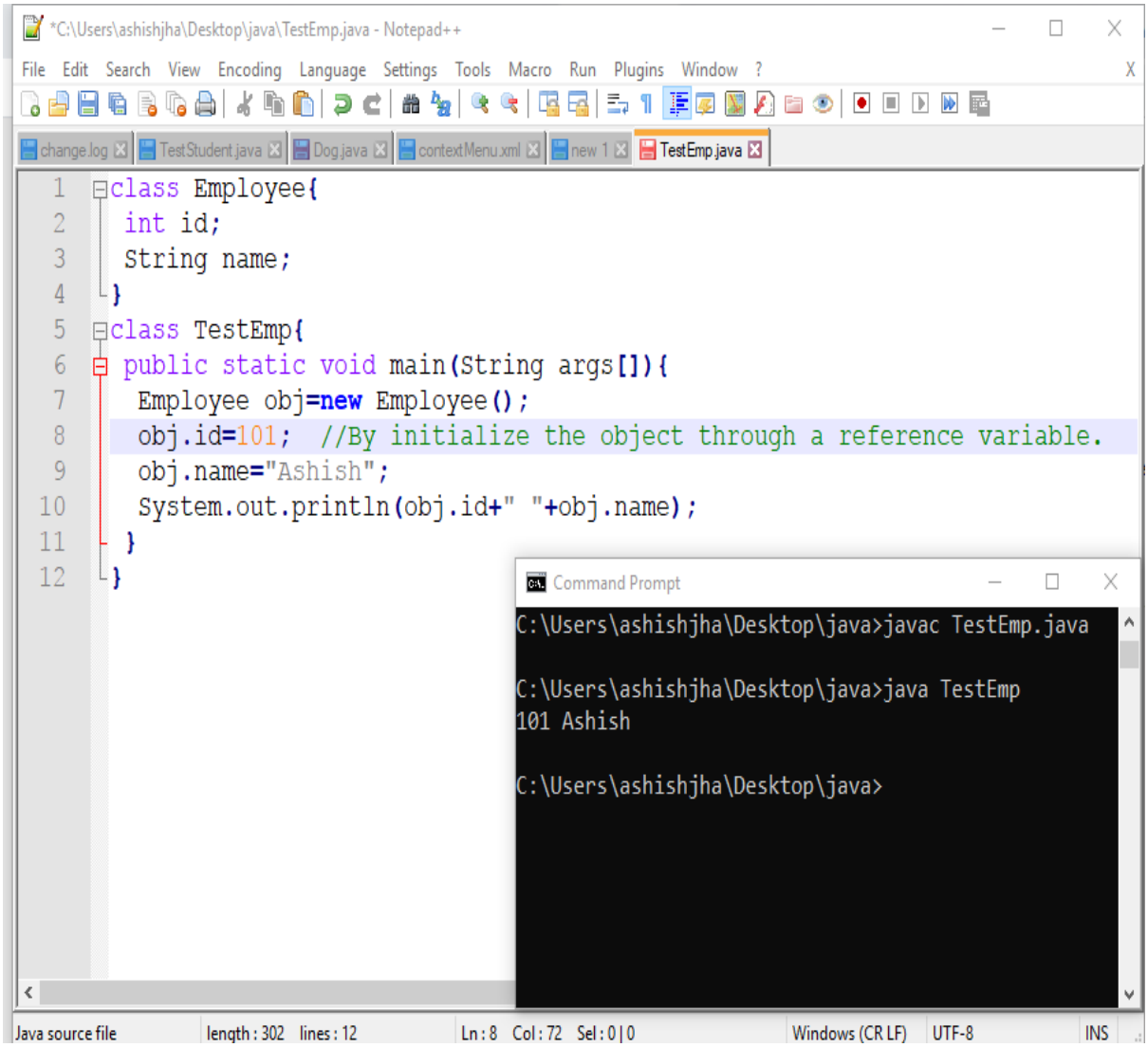
Employee obj =new Employee();//Creating object of class Emp.

There are three ways to initialize object in Java:-

1. **By reference variable**
2. **By method**
3. **By constructor**

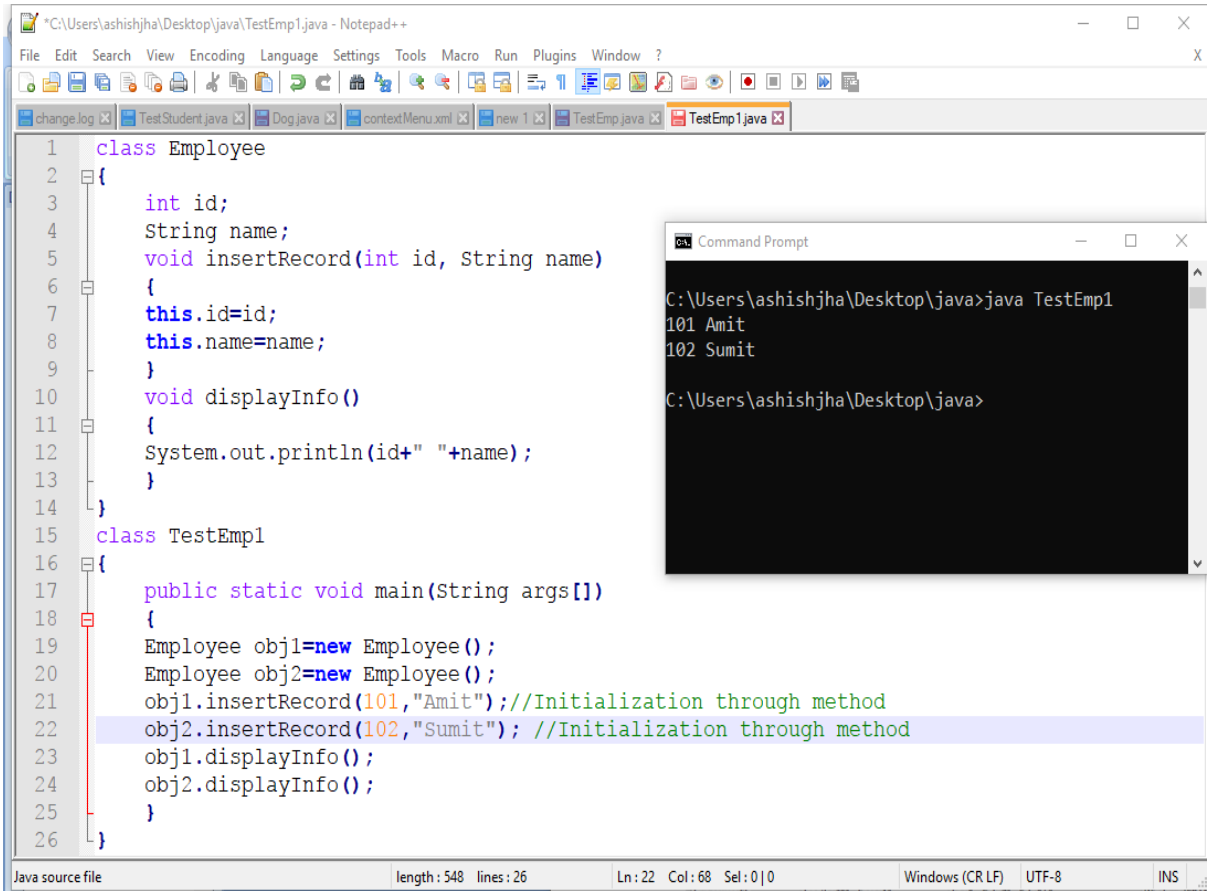
1. By reference variable:-

Example:-



2. By method:-

Example:-



3. By constructor:-

Example:-