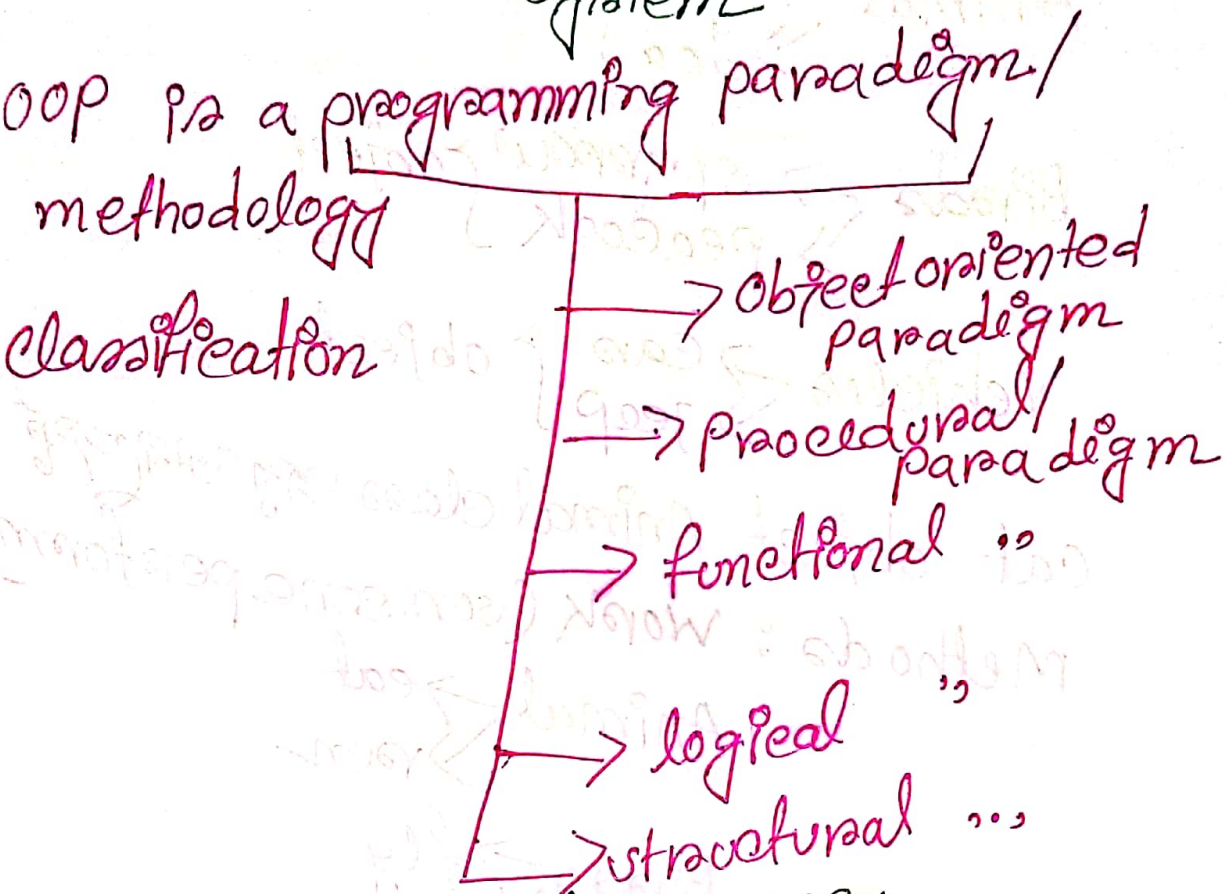
Lecture-1

"OOP Object oriented Programming System"

OOP is a programming paradigm/ methodology



6 main pillars of oop are:

(i) class
(ii) object and methods.
(iii) Inheritance
(iv) polymorphism
(v) obstraction
(vi) Encapsulation

"Class"

Animal → cat } object
→ dog }

Birds → sparrow } object
→ peacock }

Vehicles → cars } object
→ jeep }

cat object, Animal class এর অবজেক্ট

Methods : Work (someone perform)

Animal → eat
→ run

Birds → fly
→ eat

Class definition :

1. Class is a collection of objects.
2. Class is not a real world entity. It is just a template, blueprint or prototype.
3. Class doesn't occupy memory.

Syntax of class:

access_modifier | class | classname

public,
private,
default

- methods
- constructors
- fields
- blocks
- nested class

}

Methods

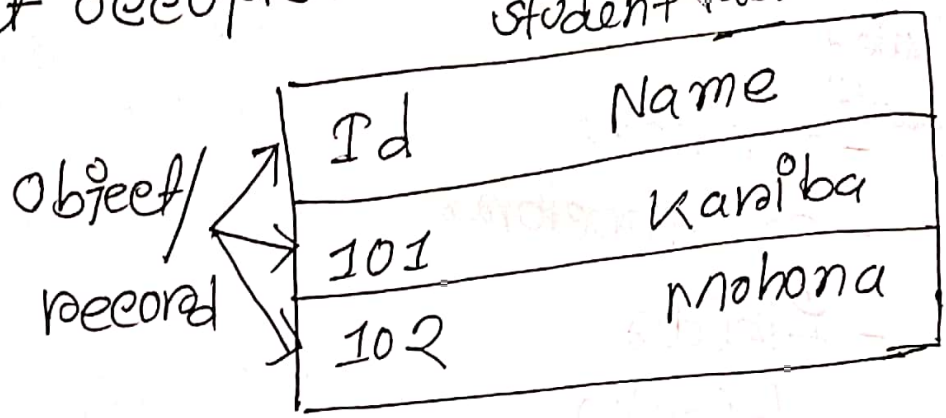
A set of codes which perform a particular task

→ Advantage:

(i) code reusability
(ii) code optimization

"Object"

→ object is an instance of class.
→ object is real world entity
→ object occupies memory



Object consists of:
i) identity (name)
ii) state / Attribute (id, name, session)
iii) Behaviour → method → (eat)

How to create object in Java ?

→ By using new keyword
→ By using instance() method
→ By using clone() ,,
→ ,, ,, deserialization ,,
→ ,, ,, factory ,,

→ by using new keyword:

i) Declaration
ii) Instantiation
iii) Initialization

Example:

suppose class is animal, say object dog)

Animal dog; (Declaration);
dog = new Animal(); (ii, iii)

[class এর নামে Type, ডিফল্ট-কন্সট্রাক্টর (constructor method)]

Object Initializing:

dog.run();
dog.color = "Brown";
dog.age = 5;

* জাভার space & memory allocation always dynamic
↳ স্ট্যাটিক্যালি না।

Class declaration:

```
Class Animal
{
public void eat()
{
System.out.println("I am eating");
}
public void run()
{
System.out.println("I am running");
}
```

declaration

definition

* প্রোগ্রামের মেক্সিমাম একটি class এ অবশ্যই একটি main থাকতে হবে। একটি প্রোগ্রামে একটি main function.

```
public static void main(String [] args)
{
System.out.println("1");
Animal dog;
dog = new Animal();
dog.eat();
dog.run();
```

→ [main function শেষ close]

} [class animal ,, ,,]

```
Birds peacock;
peacock = new Birds();
peacock.fly();
```

* একটি class হলো

```
Class Birds
{
  public void fly()
  {
  System.out.println("I am flying");
  }
}
```

(*) Object initialization:

(I) By reference variable
(II) By method
(III) By constraction

① By reference variable:

```
class Animal
{
string color;
int age;
public static void main(string[] args)

{
Animal dog = new Animal();
dog.color = "black";
dog age = 10;
System.out.println(dog.color
                  +"    "+dog.
                   age);

}

}
```

↓

[প্রকাশে দিতে হলে '+' অপারেটর use করতে হবে]

② By using method :

```
class Animal
{
String color;
 int age;
 void int obj (string c, int a);
 {
   color = c;
    age = a;
 }
void display()
 {
  system.out.println ( color " " +
                        age);
 }
public static void main (string[]
                          args)
 { Animal dog = new Animal();
   dog.intobj ("black", 10);
    dog.display();

 }
```