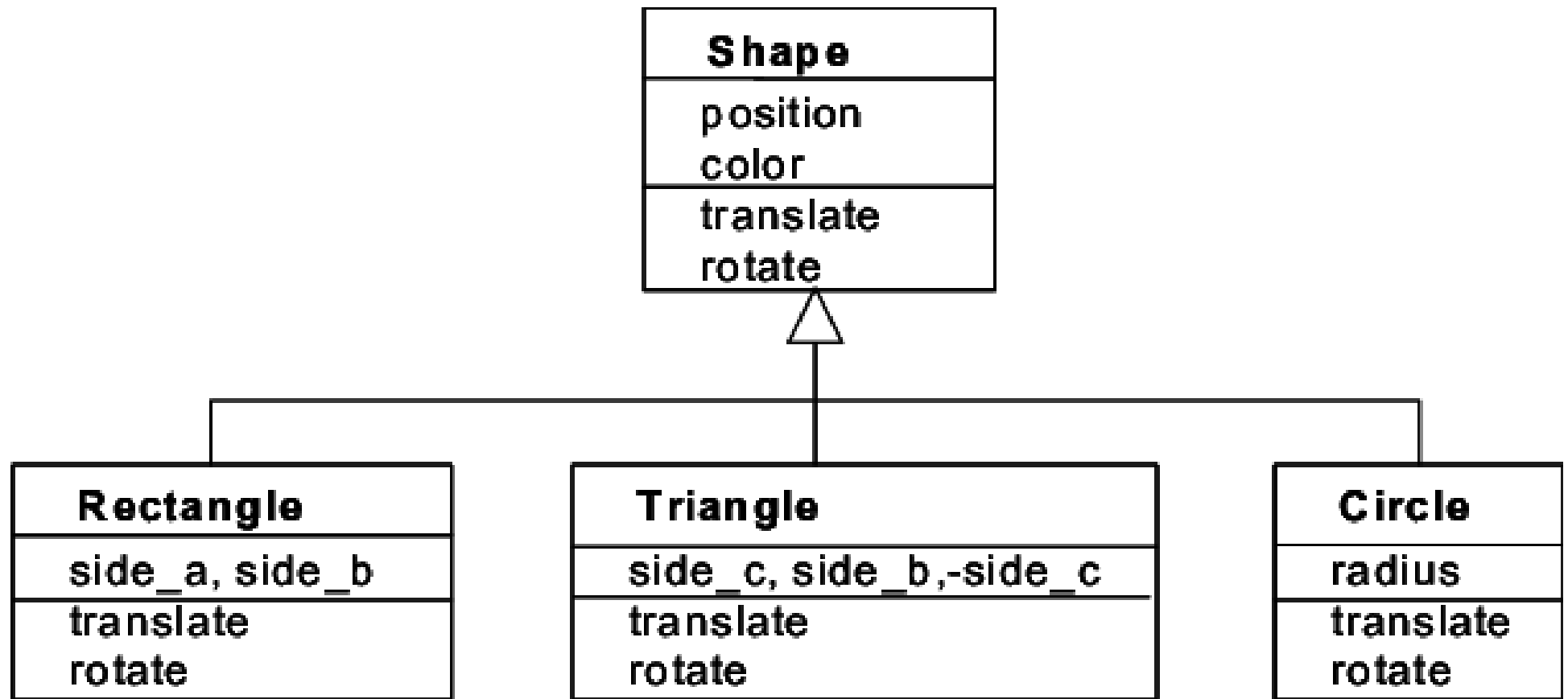# Objects In Java

Class and Object

Object	Class
Object is an instance of a class.	Class is a blueprint or template from which objects are created.
Object is a real world entity such as pen, laptop, mobile, bed, keyboard, mouse, chair etc.	Class is a group of similar objects.
Object is a physical entity.	Class is a logical entity.
Object is created through new keyword mainly e.g. Student s1=new Student();	Class is declared using class keyword e.g. class Student{}
Object is created many times as per requirement.	Class is declared once.
Object allocates memory when it is created.	Class doesn't allocated memory when it is created.
There are many ways to create object in java such as new keyword, newInstance() method, clone() method, factory method and deserialization.	There is only one way to define class in java using class keyword.

Advantage Of Class

```
                        ┌─────────────────────┐
                        │       Shape         │
                        ├─────────────────────┤
                        │   position          │
                        │   color             │
                        ├─────────────────────┤
                        │   translate         │
                        │   rotate            │
                        └──────────△──────────┘
                                   │
          ┌────────────────────────┼────────────────────────┐
┌─────────────────────┐  ┌─────────────────────────┐  ┌──────────────────┐
│     Rectangle       │  │       Triangle          │  │     Circle       │
├─────────────────────┤  ├─────────────────────────┤  ├──────────────────┤
│   side_a, side_b    │  │   side_c, side_b,-side_c │  │     radius       │
├─────────────────────┤  ├─────────────────────────┤  ├──────────────────┤
│   translate         │  │   translate             │  │     translate    │
│   rotate            │  │   rotate                │  │     rotate       │
└─────────────────────┘  └─────────────────────────┘  └──────────────────┘
```

Change is part of life

Actual logic that client wanted

- For the amoeba shape the client wanted the rotate to be implemented differently
- The amoeba shape was suppose to rotate around a point at one end

implemented

required

Lecture Class

- Topic of the lecture
- Guest speaker
- Date
- Time
- What is a constructor?

Guessing Game

- Game master generates a random number
- Players have to guess the number
- The player who guess first the correct number is the winner
- What are the objects?

The Player

```java
public class Player {
  int number = 0; // where the guess goes
  public void guess() {
   number = (int) (Math.random() * 10);
  }
}
```

Assignment

- Enhance the Guessing Game to play with multiple players

- Bonus points if the game is played over multiple rounds