

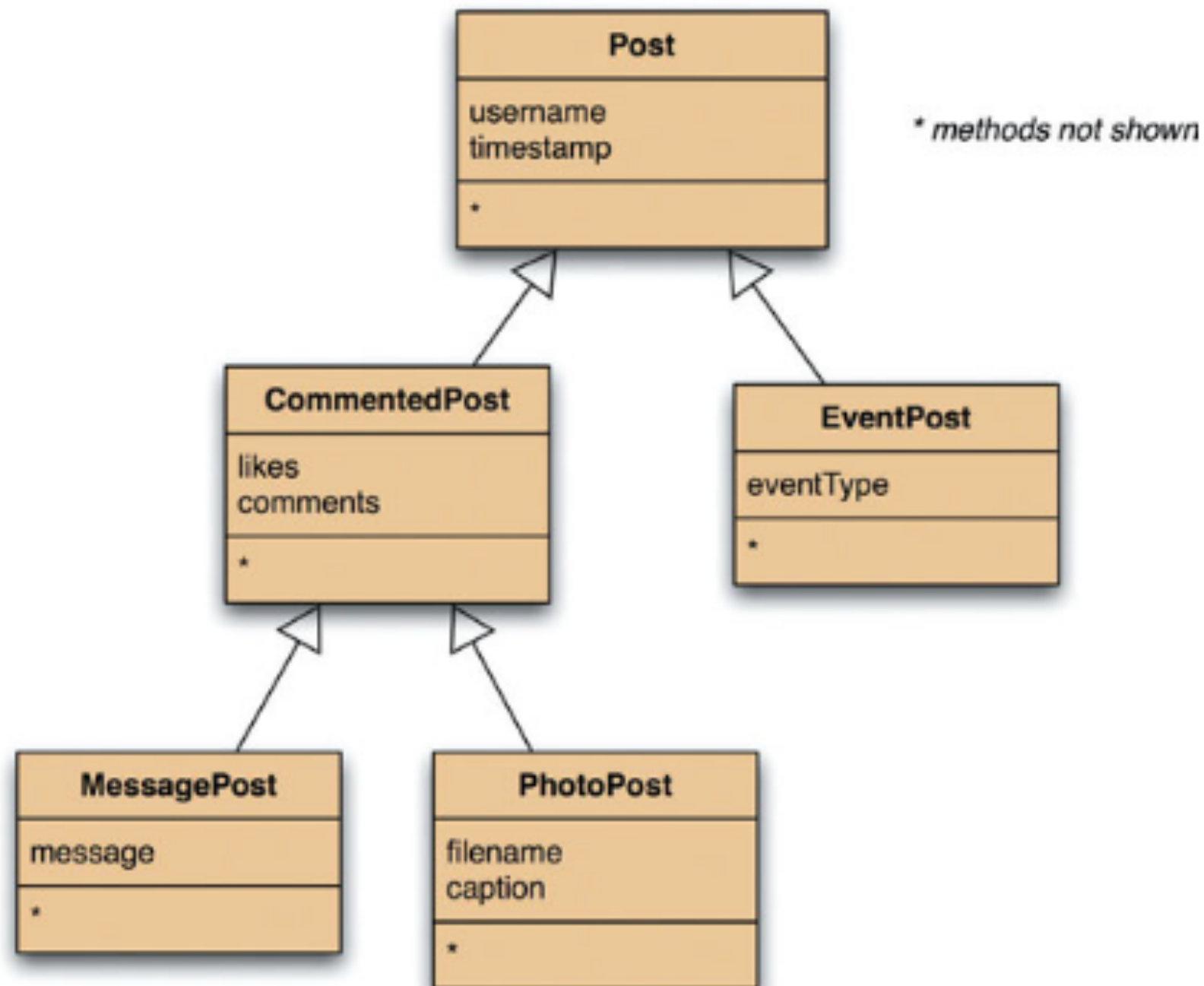
# Inheritance

juampi

# Inheritance hierarchies

- Classes that are linked through inheritance relationships form as **inheritance hierarchy**.

# Inheritance hierarchies



# Inheritance and initialization

- Initialization of subclass and superclass fields.

# Superclass constructor

- The constructor of a subclass must always invoke the constructor its superclass as its first statements. If the source code does not include such a call, Java will attempt to insert a call automatically.

# Concept:

- Inheritance allows us to reuse previously written classes in a new context.

# Advantages of inheritance (so far)

- Avoiding code duplication
- Code reuse
- Easier maintenance
- Extendibility

# Subtyping



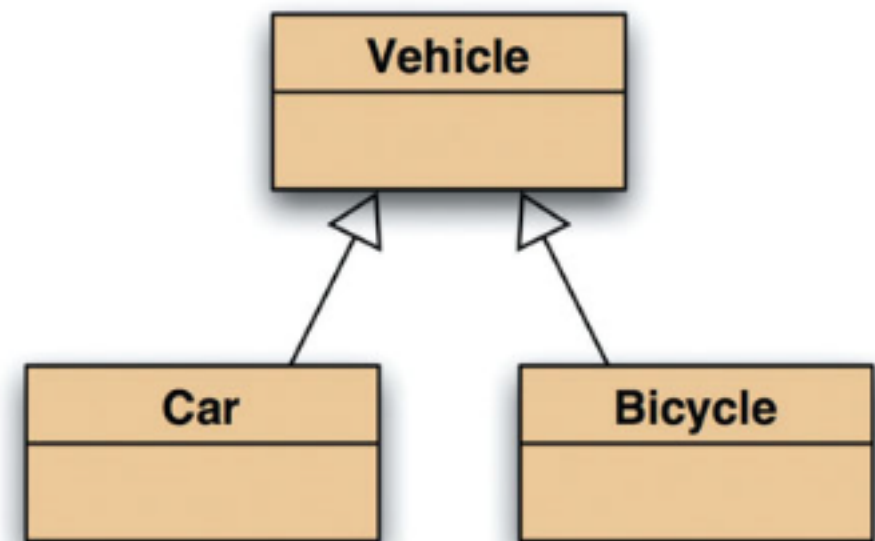
# Subtyping and assignments

`Car myCar = new Car();`

`Vehicle v1 = new Vehicle();`

`Vehicle v2 = new Car();`

`Vehicle v3 = new Bicycle();`



Exercise: Which of the following assignments are legal?

**Person p1 = new Student();**

**Person p2 = new PhDStudent();**

**PhDStudent phd1 = new Student();**

**Teacher t1 = new Person();**

**Student s1 = new PhDStudent();**

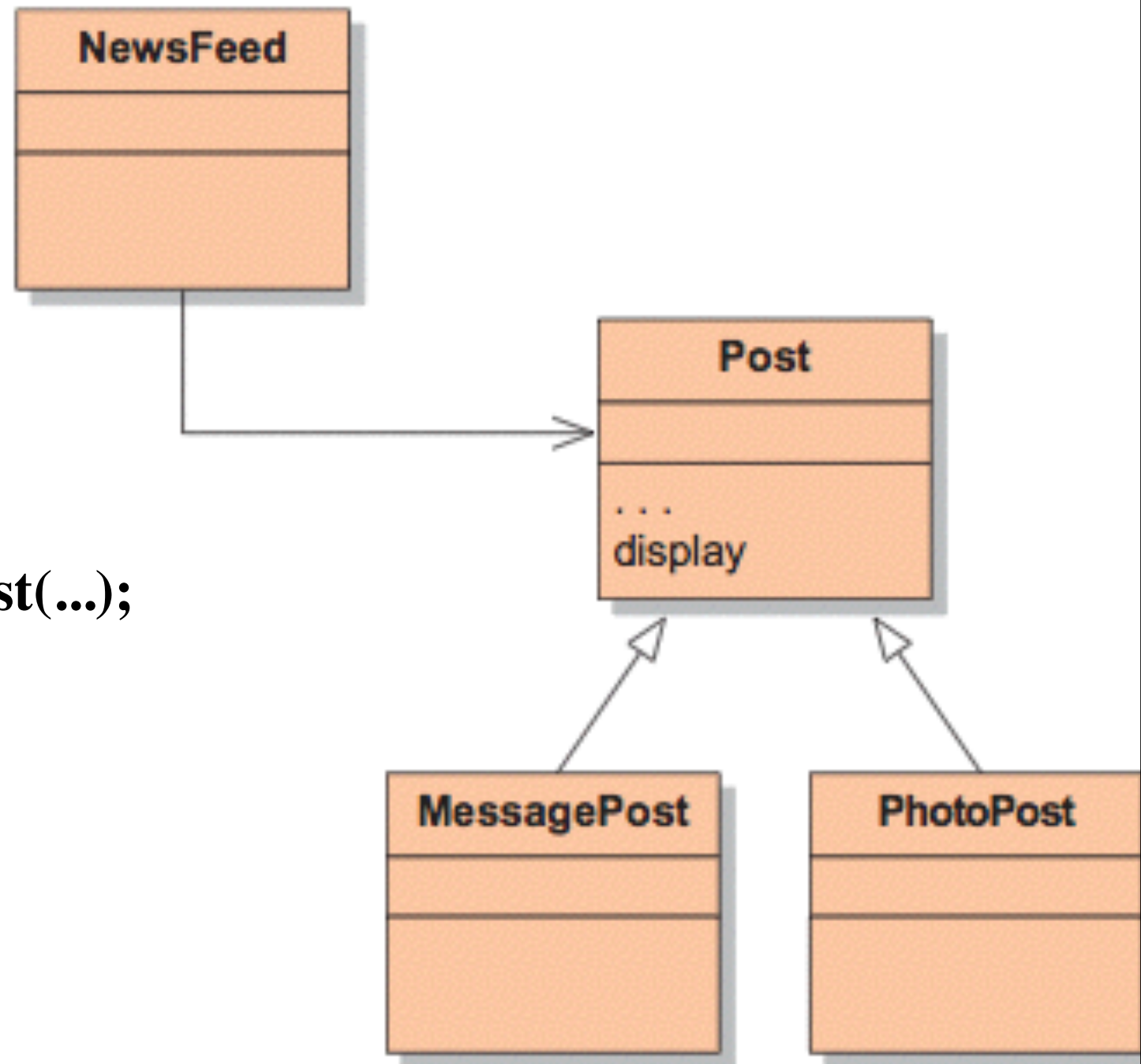
# Exercise: Which of the following assignments are legal?

```
Person p1 = new Person();  
Person p2 = new Person();  
PhDStudent phd1 = new PhDStudent();  
Teacher t1 = new Teacher();  
Student s1 = new Student();  
s1 = p1;  
s1 = p2;  
p1 = s1;  
t1 = s1;  
s1 = phd1;  
phd1 = s1;
```

# Subtyping and parameter passing

```
public class NewsFeed
{
    public void addPost(Post post)
    {
        ...
    }
}
```

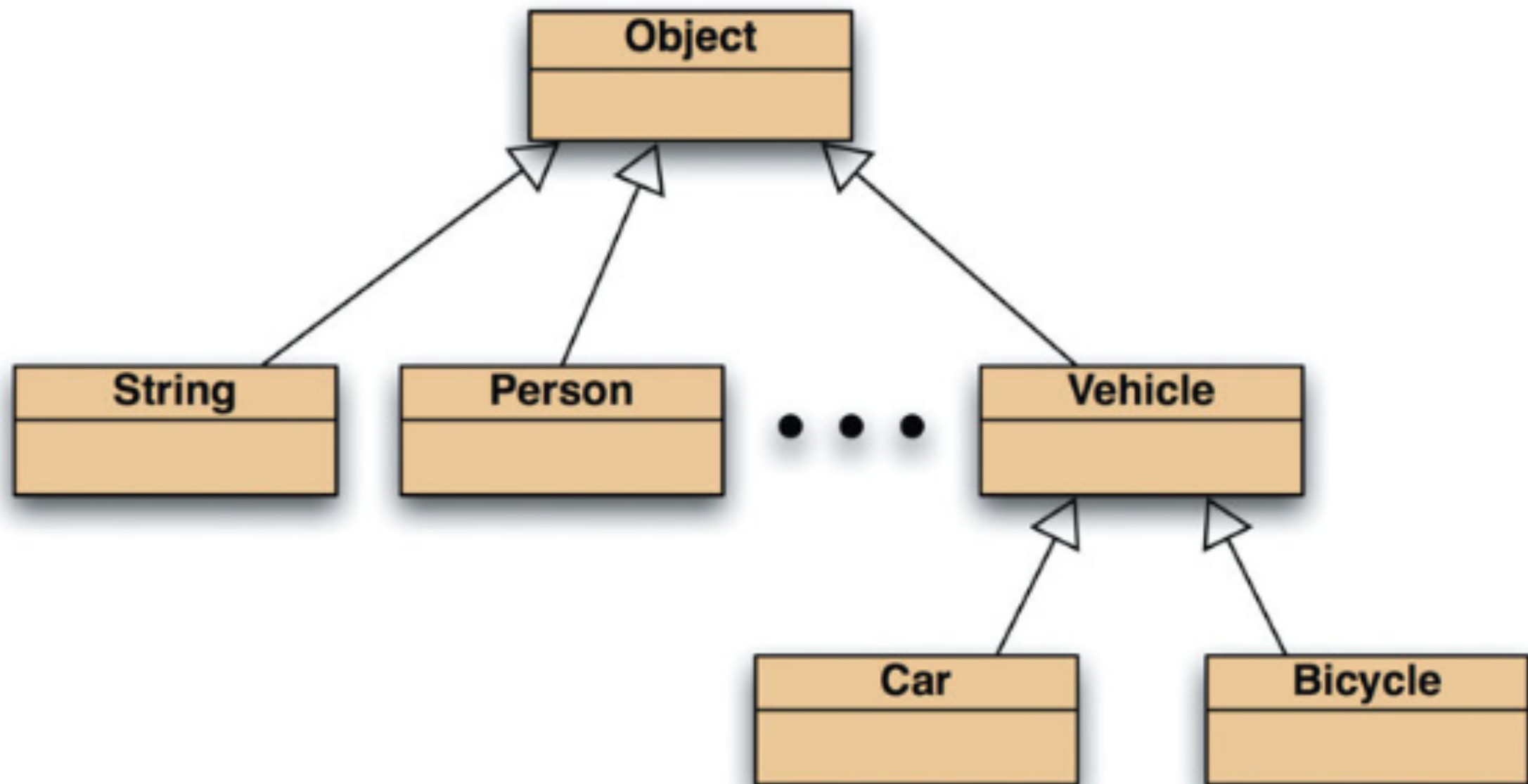
```
NewsFeed feed = new NewsFeed();
MessagePost message = new MessagePost(...);
PhotoPost photo = new PhotoPost(...);
feed.addPost(message);
feed.addPost(photo);
```



# The Object class

- All classes with no explicit superclass have Object as their superclass.

# The Object class



# Draw the class diagram

**O o;**

**X x;**

**T t;**

**M m;**

The following assignments are all legal (assume that they all compile):

**m = t;**

**m = x;**

**o = t;**

The following assignments are all illegal (they cause compiler errors):

**o = m;**

**o = x;**

**x = o;**

# The Social Network

- Juampi, not read this, go to the blue example