Introduction to Programming
with Java, for Beginners

Object creating another object
Key word “this”

- this is a reference to the current object
- The object whose method or constructor is being called
- The value of “this” is an object’s heap address
  - Can be passed as argument to a method
  - Can be returned as value

```
public class Dot{
    private int x;
    private int y;
    public Dot(int X, int Y){
        x = X;
        y = Y;
    }
    public Dot displacedDot(int dispAmt){
        int newX = x + dispAmt;
        int newY = y + dispAmt;
        return new Dot(newX, newY);
    }
}
```

```
public class Dot{
    private int x;
    private int y;
    public Dot(int x, int y){
        x = x; // problem!!
        y = y;
    }
}
```

```
public class Dot{
    private int x;
    private int y;
    public Dot(int x, int y){
        this.x = x; // fixed!!
        this.y = y;
    }
}
```

“this” with data fields

```
public class Dot{
    private int x;
    private int y;
    public Dot(int x, int y){
        x = x; // problem!!
        y = y;
    }
}
```

```
public class Dot{
    private int x;
    public Dot(int x, int y){
        this.x = x; // fixed!!
        this.y = y;
    }
}
```

Local variable x & y shadows the instance variable x & y
Facebook Example

- FBPerson has a name and at most one friend
- Rules for adding a friend
  - When FBPerson A chooses FBPerson B to be a friend, the operation succeeds if:
    - A is not B
    - A has no friends
    - B has no friends
  - Note that A has a friend who is B if and only if B has a friend who is A.
    - In other words, when A adds B as a friend, B must also add A as a friend

```java
class FBPerson{
    ...
    public boolean addFriend(FBPerson p) {
        if (p == this || this.hasAFriend() == true || p == null){
            return false;
        }
        if (p.hasAFriend() == true){
            return false;
        }
        this.setFriend(p); //set current FBPerson object's friend to FBPerson p
        p.setFriend(this); //set FBPerson P's friend to this object
        return true;
    }
}
```

Interactions for FBPerson

- FBPerson jo = new FBPerson("jo brown");
- FBPerson flo = new FBPerson("flo smith");
- FBPerson mo = new FBPerson("mo jones");
- jo.hasAFriend() false
- jo.addFriend(flo) true
- jo.getFriend().getName() "flo smith"
- flo.getFriend().getName() "jo brown"
- jo.addFriend(mo) // jo already has a friend so cannot add mo as friend false
- mo.addFriend(jo) false
- mo.hasAFriend() false