

Introduction to Programming

with Java, for Beginners

Object creating another object
Keyword "this"

Object creating another object

```
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
        Dot d = new Dot(newX, newY);
        return d;
    }
}
```

> Dot d1 = new Dot(5,3);
> d1.getX() //getX() not shown
5
> Dot d2 = d1.displacedDot(5);
> d2.getX()
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Keyword "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

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"this" with data fields

```
public class Dot{
    private int x;
    private int y;

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

Local variable **x & y**
shadows the instance
variable **x & y**

```
public class Dot{
    private int x;

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

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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

FBPerson

String name FBPerson person
getName() getFriend() setAFriend() hasAFriend() addAFriend()

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Facebook Example

```
class FBPerson{
    ...
    public boolean addAFriend(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 toFBPerson p
        p.setFriend(this); //set FBPerson P's friend to this object
        return true;
    }
}
```

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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.addAFriend(flo)
true
> jo.getFriend().getName()
"flo smith"
> flo.getFriend().getName()
"jo brown"
> jo.addAFriend(mo) //jo already has a friend so cannot add mo as friend
false
> mo.addAFriend(jo)
false
> mo.hasAFriend()
false
```

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