

CSSE 220

Objects

Check out *SuperSimpleObjects* and *TeamGradebook* from SVN

Plan for today

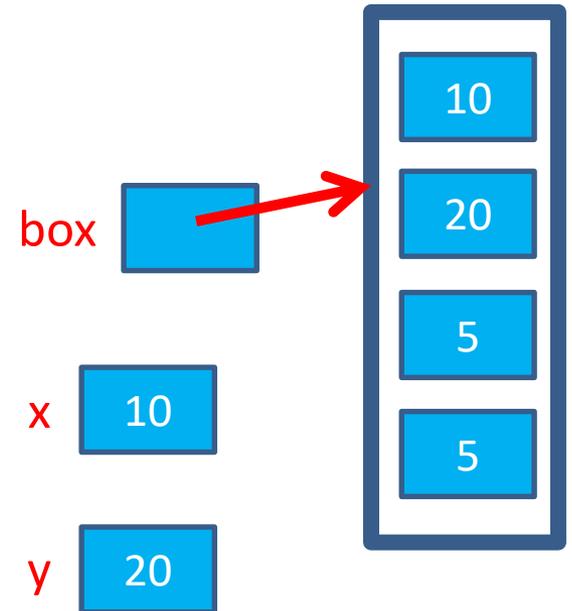
- Introduce how to write your own classes
- Talk about object references and box and pointer diagrams
- Get started on TeamGradebook, your new assignment

Differences between primitive types and object types in Java

OBJECT REFERENCES

What Do Variables Really Store?

- Variables of **primitive type** store *values*
- Variables of **class type** store *references*



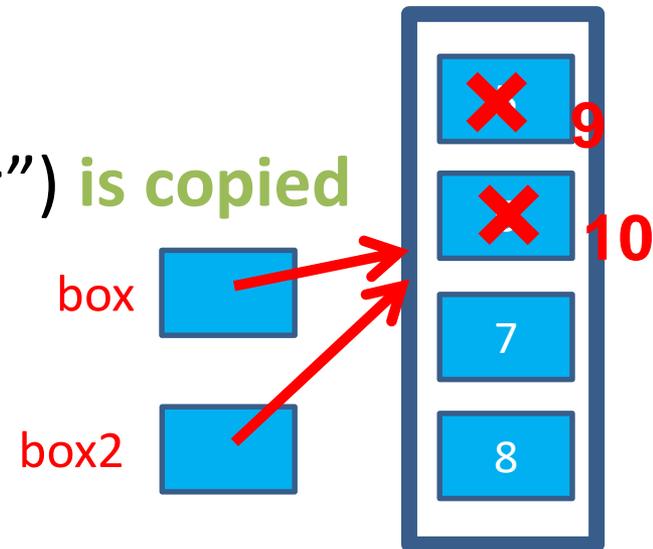
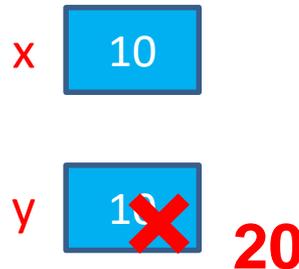
```
1. int x = 10;  
2. int y = 20;  
3. Rectangle box = new Rectangle(x, y, 5, 5);
```

Assignment Copies Values

- **Actual** value for number types
- **Reference** value for object types
 - The actual **object is not copied**
 - The **reference value** (“the pointer”) **is copied**

- Consider:

```
1. int x = 10;  
2. int y = x;  
3. y = 20;
```



```
4. Rectangle box = new Rectangle(5, 6, 7, 8);  
5. Rectangle box2 = box;  
6. box2.translate(4, 4);
```

Boxes and lines exercise

Separating implementation details from how
an object is used

ENCAPSULATION

Encapsulation in Object-Oriented Software

- *Encapsulation*—separating implementation details from how an object is used
 - Client code sees a *black box* with a known *interface*

	Functions	Objects
Black box exposes	Function signature	Constructor and method signatures
Encapsulated inside the box	Operation implementation	<u>Data storage</u> and <u>operation implementation</u>

Start on TeamGradebook

- Try to finish the code for both add-student and get-names today
- If you are confused about what to do, get help!