For Wednesday

- Read 6.5-6.6
- Recommended practice problems: chapter 6, 1-10 if you haven’t done them yet

Program 4

- Any questions?

```
while (karel.getAvenue() != 2 &&
  karel.getStreet() != 2)
{ while(!karel.frontIsClear())
{ if (karel.canPickThing())
{ karel.pickThing();
karel.move();
} else
{ karel.move(); }}
karel.turnRight();}
```

Practice

- Write a method that uses a for loop to add the numbers 1 to 10 and returns the result.

- Write a **method** to compute the sum of all integers between first and second (including first and second), where first and second are integers and first <= second. The method should return the sum. You may not change the value of either first or second.

- Write a method to find the smaller of two integers. The method will accept two integers and return the smaller of the two. If they are the same, then the method returns either one of them.

- Telephone company rules to calculate the cost of a long distance call are as follows.
  - If the cost of the call is over 60 minutes, the cost is 7 cents per minute.
  - If the call is over 20 minutes long, the cost is 10 cents per minute.
  - If the call is 20 minutes or less, the cost is 13 cents per minute.
- Write a method that takes the length of a call in minutes and returns the per minute rate for that call.

- A carpenter computes the price of a desk as follows:
  - The charge for all desks is a minimum of $200
  - If the surface (length * width) is over 750 square inches, add $50
  - If the wood code is 1 (mahogany), add $100. If the wood code is 2, add $75. If the wood code is 3 (pine), there is no extra charge.
- Write a method that takes the surface of a desk and the wood code and returns the cost of the desk.

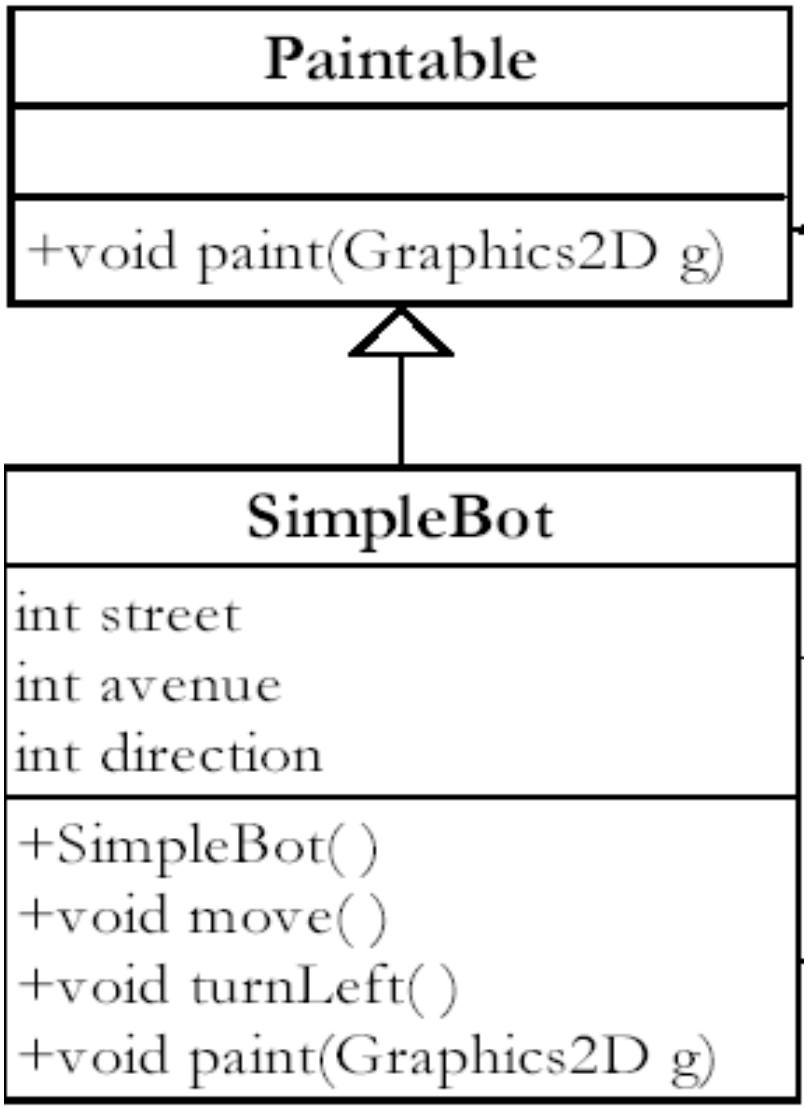
- A company gives bonuses based on production as follows:
  - 1000 units or fewer, the bonus is $25
  - 1001 to 3000 units, the bonus is $50
  - 3001 to 6000 units, the bonus is $100
  - 6001 units and up, the bonus is $200
- Write a method that accepts the number of units produced and determines the bonus for the employee. Return the bonus.

- Write a method to determine the purchaser's discount based on a code.
  - If the code is 7, the discount is 10%.
  - If the code is 3, the discount is 15%.
  - If the code is 12, the discount is 4%.
  - If the code is 1, there is no discount.
  - If the code is 8, the discount is 30%.
- The method should return the discount. Use a switch statement.

Instance Variables

- Used to keep track of the information about an object
- Defined in the class
- Each object has its own instance variables
- The instance variables are accessible in all of the class's methods
- The instance variables' lifetimes are the same as the object's lifetime

Example: Simplified Robot



- SimpleBots can be displayed in a SimpleCity.
- Attributes describe information about the robot.
- Methods use those attributes.

Declaring Instance Variable

- Three major pieces
  - An access modifier (almost ALWAYS private)
  - A type specifying the kind of data
  - A descriptive name
- May also provide an initial value for the instance variable here – often done in the constructor

Using Instance Variables

- Somewhat similar to temporary variables.
- In this case, the paint method would use the street and avenue to figure out where to paint the robot.

Handling Direction

- Named constants

Accessor Methods

- Also called getters.
- Used to find out the value of a particular instance variable (attribute)
- Often, but not always, desirable

Mutator Methods

- Also called setters
- Used to directly modify the value of an instance variable.
- Sometimes appropriate, but sometimes not.
- Only provide appropriate setters.

Managing Data in Java

- Instance variables
- Temporary variables
- Parameters
- Constants

A Harvester That Counts