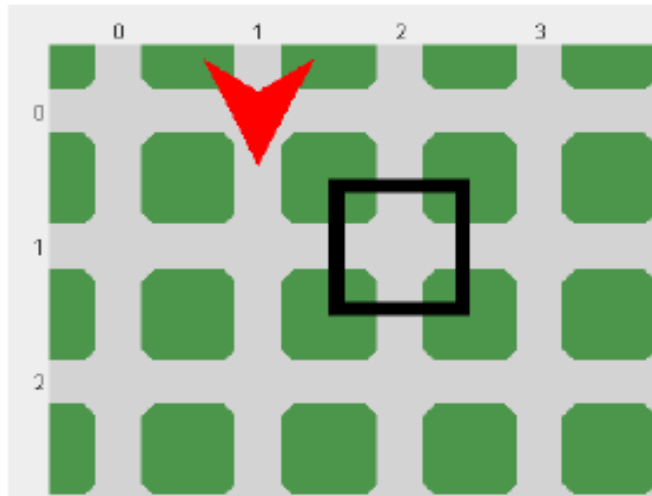


For Wednesday

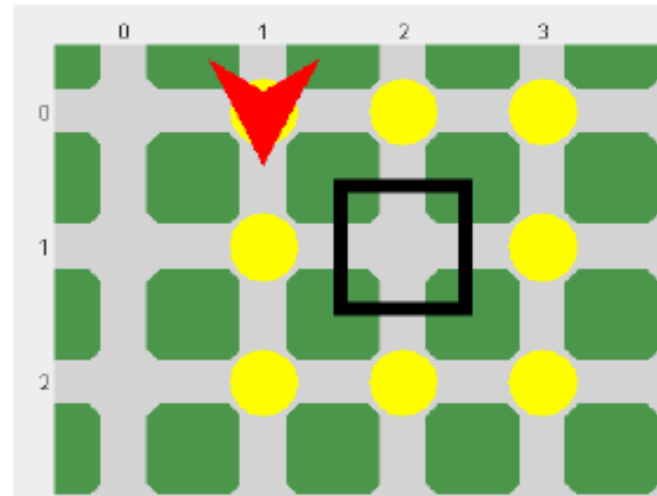
- Read Becker, sections 2.3-2.6 (skip 2.3.4 and 2.3.6)
- Recommended practice problems: chapter 2, problems 1-3

Planting Flowers

- You have a square enclosure. You want to have a robot plant flowers (Things) around the enclosure. See below.



Initial Situation



Final Situation

Questions:

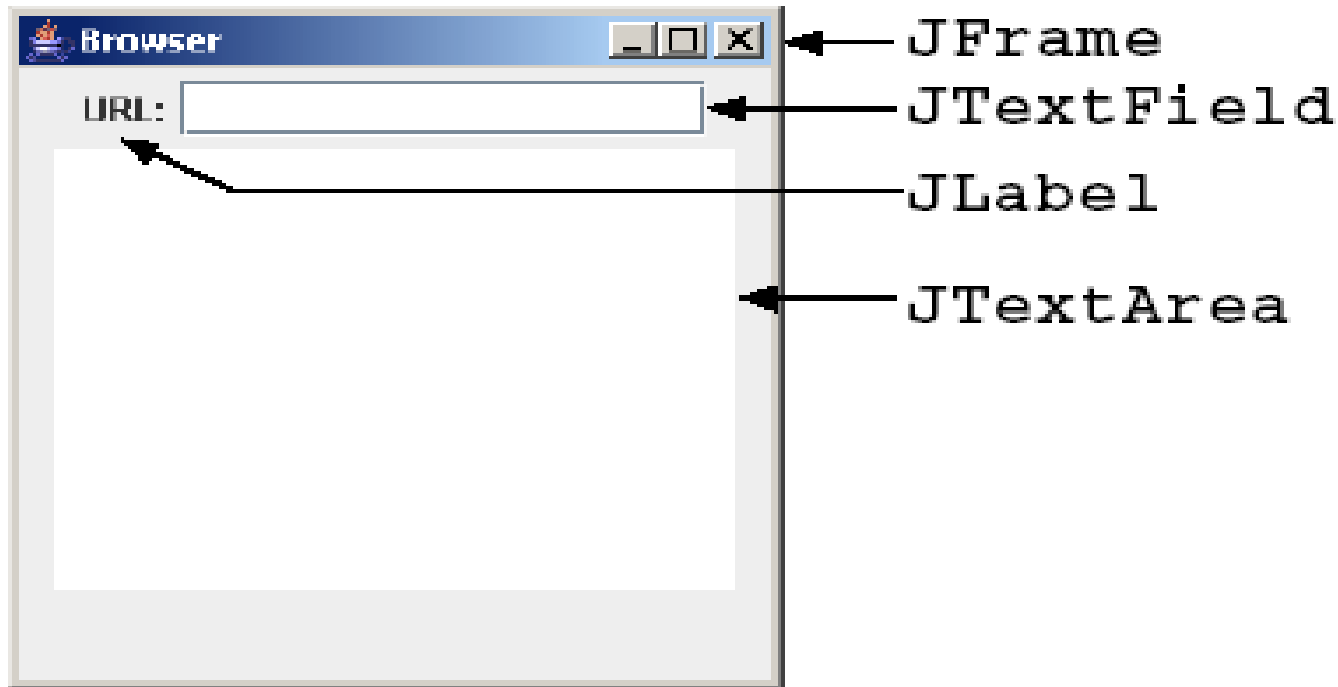
How many walls are there? How are they positioned?
Where do the flowers come from?

Beyond Robots

- Objects are used in all contexts in Java programs.
- The same patterns are used to develop GUI (Graphical user interface) programs as to develop Robot programs.
- However, the classes we use are different.

Sample Simple GUI

- Use the `JFrame`, `JLabel`, `TextField`, and `TextArea` classes to produce a program that creates a window that looks like a browser window (sort of).



Adding Services

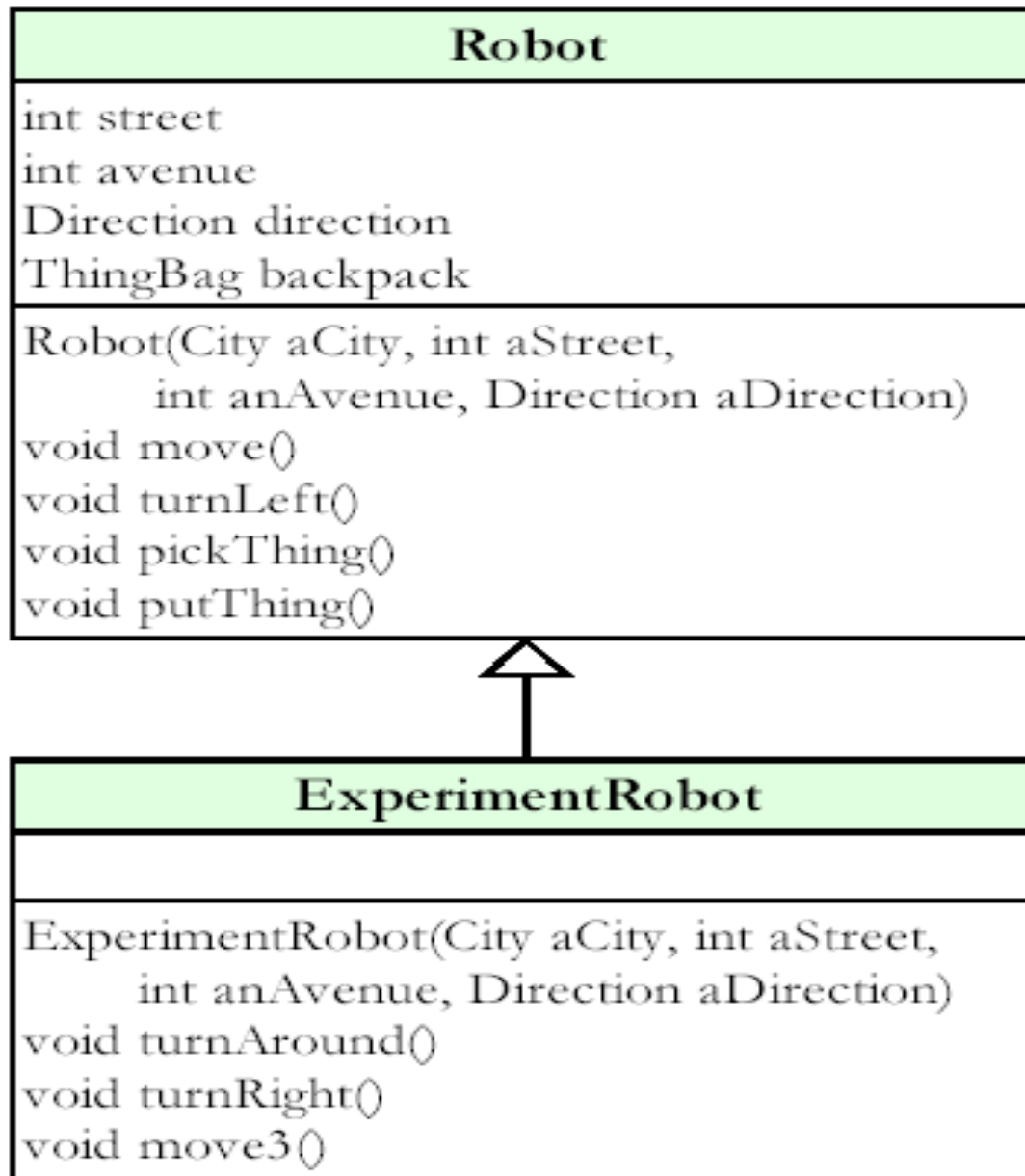
- What are some advantages to being able to create “customized” robots?

Vocabulary

- Superclass --- subclass
- Parent --- child
- Base class --- derived class

- Extends
- Inherits from

Class Diagrams



Extended Class Pattern

Constructors

- What's the purpose of a constructor?

Writing Constructors

```
public class ExperimentRobot extends Robot
{
    // A constructor to initialize the ExperimentRobot
    public ExperimentRobot(City aCity, int aStreet, int
        anAvenue, Direction aDirection)
    { super(aCity, aStreet, anAvenue, aDirection);
    }
    // Another constructor to initialize the ExperimentRobot
    to be in a standard position.
    public ExperimentRobot(City aCity)
    { super(aCity, 0, 0, Direction.EAST);
    }
    // The new services offered by an ExperimentRobot will be
    inserted here.
}
```

Usage:

```
ExperimentRobot lisa = new ExperimentRobot(austin, 3, 2,
    Direction.SOUTH);
ExperimentRobot larry = new ExperimentRobot(austin);
```

Creating New Services

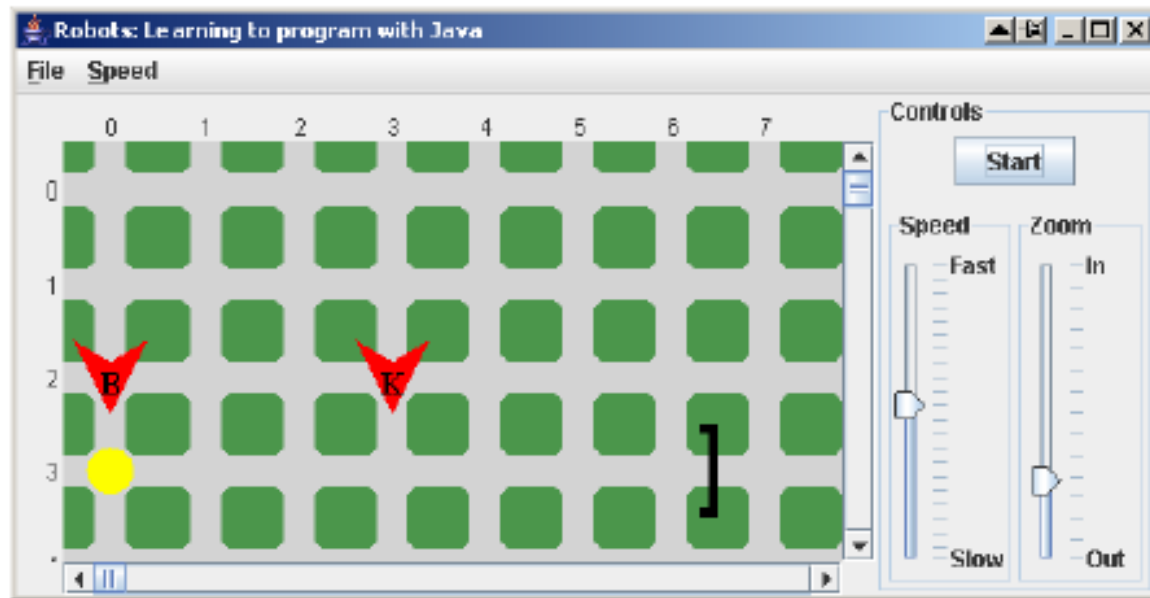
Flow of Control

- What happens when we actually call a method?

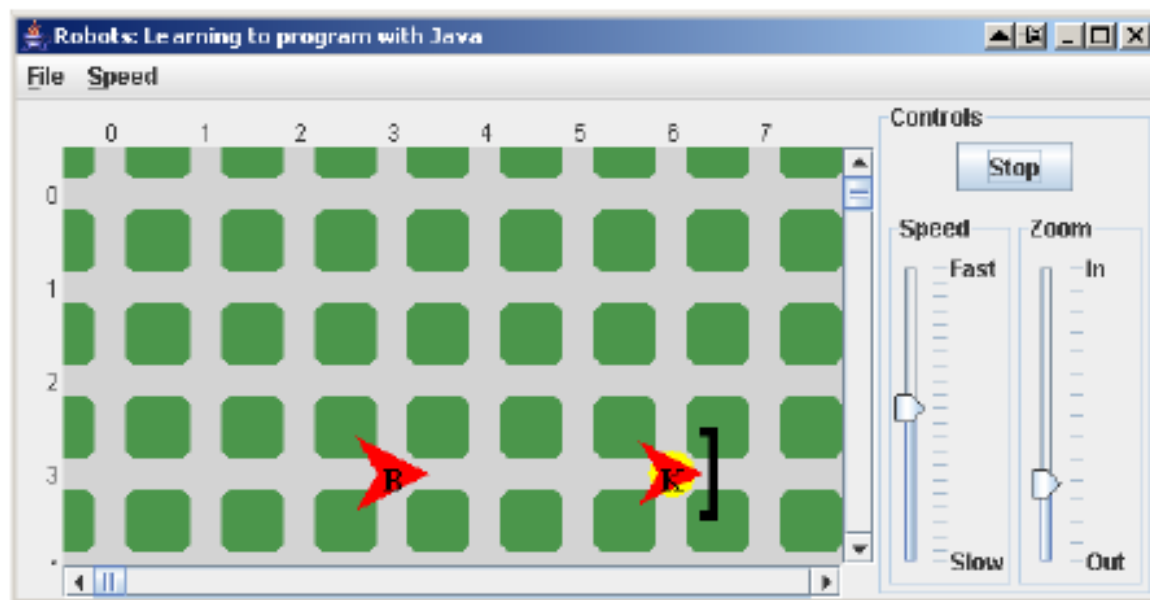
RobotSE

- More capable version of Robot
- Extension vs. Modification

Two robots running a “relay.”



Initial Situation

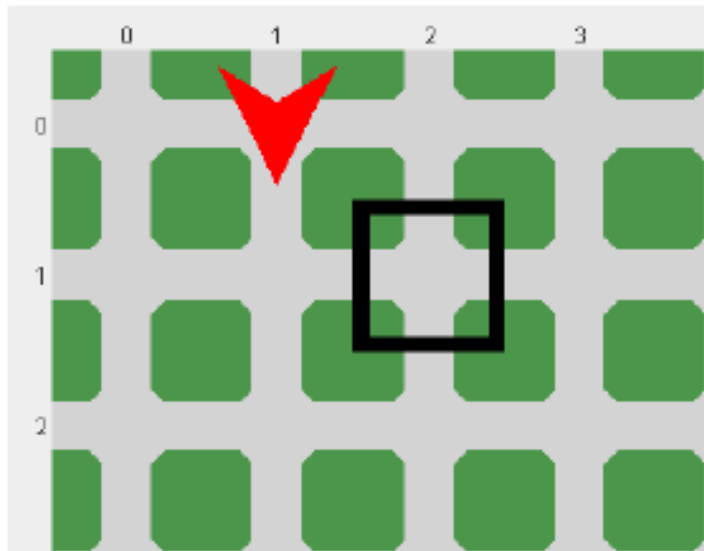


Final Situation

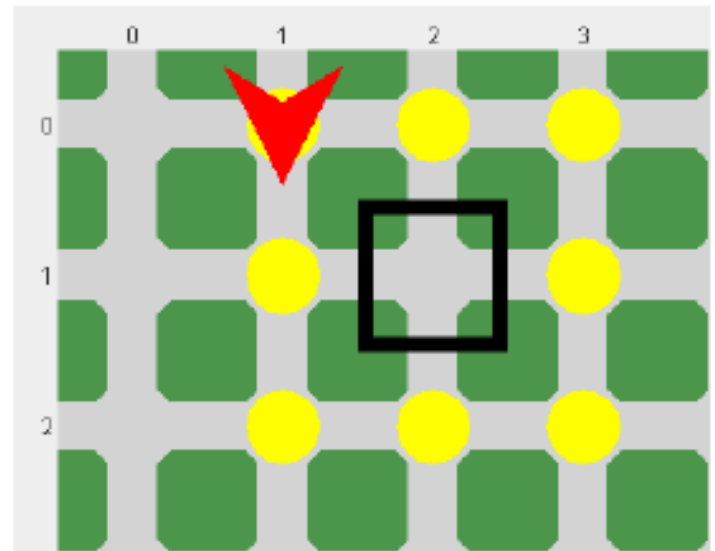
“B” picks up the baton and takes it to “K”, who finishes the race.

Planting Flowers Again

- We're going to redo the planting flowers problem with two modifications:
 - Create and use a **GardenerBot** that has a method **plantFlowers**, which plants all the flowers.
 - Create an extended version of City called **Garden** that automatically includes the four walls.



Initial Situation



Final Situation