

# DIT948 Programming H16

## Lecture 9

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QUESTIONS?

# Plan

- ▶ Last time

1. packages
2. modifiers

- ▶ Today's Plan:

1. Javadoc and Java APIs
2. Robot APIs

## Objectives

Object-oriented programming is not at its best in small-scale programming (what we called “algorithm design” in Lecture 5).

To practice OOP we need to have a system of at least modest size.

B.W. Becker’s book *Java: Learning to Program with Robots* provides an excellent such system.

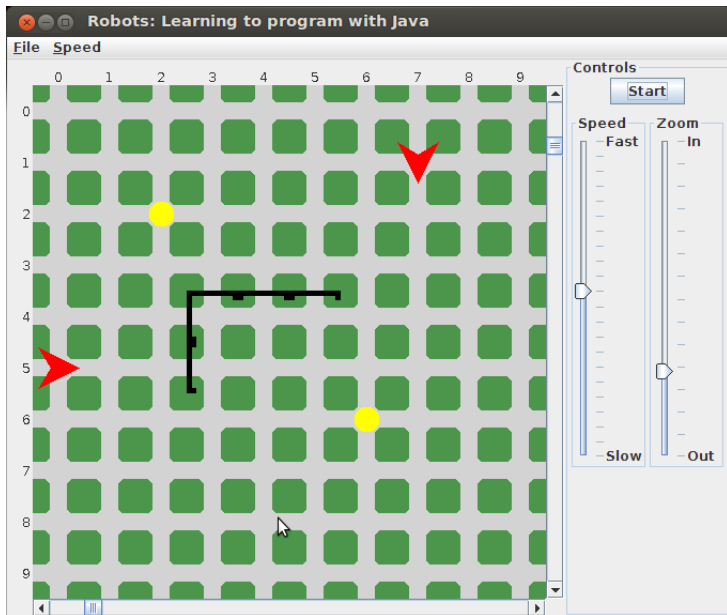
# Objectives

Working with this system will enable us to










- ▶ experiment with OOP design;
- ▶ learn how to read documentation;
- ▶ learn how to work with an existing codebase.

All of these are vital in your future studies and career.

# The Robot World



# The Robot class

Robot	
	int street
	int avenue
	int numThings
	Direction direction
	Robot(City city, int street, int avenue, Direction direction):Robot
	move():void
	pickThing():void
	turnLeft():void
	...

Documentation

## The City class

All Robot constructors require a City.

The City class does not seem very interesting.

City
<ul style="list-style-type: none"><li>City(int numVisibleStreets, int numVisibleAvenues):City</li><li>showFrame(boolean b):void</li></ul>

Documentation

We need to experiment a bit with City.

Initial code



# Putting Things in a City

A city can contain

- ▶ generic Things
- ▶ Walls
- ▶ and, of course, Robots.

A first example

## Creating a world

It's annoying to have to redo the creation every time.

It is better to package everything in a new kind of City!

A first world

## Experimenting with Robot

- ▶ `move`, `turnLeft`, `pickThing`
- ▶ limited, explodes, not good

Initial code

## Extending Robot

- ▶ New methods: `move(n)`, `turnRight`, `turnAround`
- ▶ doesn't explode

SmartRobot

## Changing Things

The elements of the robot world can be customized: we can change the color, add labels, etc. Check the documentation!

## RandomRobot

Having to write the move code for the robot is boring: we can add a “move about randomly” method.

RandomRobot

# Homework

Read the first 3 chapters of Becker's book.