



ITEC 120

Lecture 9
Lego Robots

Review

- Exam
- Basics of programming
 - Variables
 - Method calls
 - Functions
 - Conditionals
 - Looping

Lego Robots




Reflection

- Procedural programming
 - Variables
 - Method calls
 - Functions
 - Conditionals
 - Loops

Lego Robots

Application

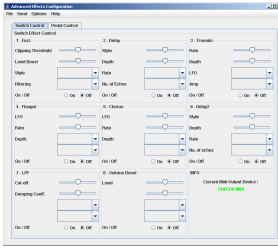
- Take what you know and apply it to a domain
- Possibilities



Lego Robots

Why not


- GUIs take time
- Thousands of lines
- Object oriented
 - Not quite ready



Lego Robots

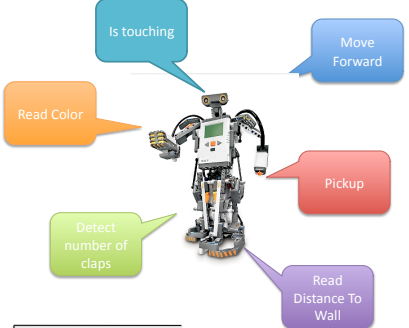
Why

- Can use what you've learned
- Precursor to real robots
 - Same code



Lego Robots

Possibilities



Lego Robots

Interface

- Scanner => Keyboard
- Robot => Lego robot
- Call methods on it
 - Movement
 - Sensors
- Use information to change the program

```
Robot rob = new Robot();
rob.moveForward();
```

Lego Robots

List of methods

- File itself
 - <http://www.radford.edu/~aaray/Robot.java>
- Javadoc
 - <http://www.radford.edu/~aaray/robotDoc/>

Lego Robots

Movement

*This is not a high precision robot, so its accuracy may be off by an inch or 2

- Simple
 - `moveForward()`
 - `moveBackward()`
 - `turnLeft/Right/Around()`
- Precision*
 - `moveForwardXFeet(double)`
 - `turnXDegreesLeft(double)`

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Sensors

- Note: must plug into proper port for these to work!
- `numClaps()`
- `distanceToWall()`
- `readColor()`
- `isTouching()`

Lego Robots

Bluetooth

- Possible to have robots connect to other robots
 - `listen and connectTo`
- `sendDouble/getDouble`
- Disconnect

Lego Robots

Compiling / Running

Or:
nxjc file.java
nxj file

- Not javac / java
- Compile
 - nxjc file.java
- Link
 - nxjlink -o file.nxj file
- Upload
 - nxjupload file.nxj

Lego Robots

Variables / Methods

Similar to FuctionContainer
Robot rob = new Robot();

- Class name
- Methods
 - Movement / sensors

Lego Robots

Functions

- Store a particular task that the robot has to perform
- Can execute tasks in any particular order
- Group related commands together

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Loops

```
while (!rob.isTouching())
{
    rob.moveBackwardXFeet(1.0/12.0);
}
```



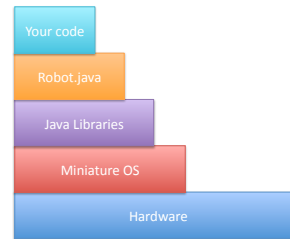
Lego Robots

Conditionals

```
String color = rob.readColor();
rob.displayString(color,0);
if (color.equals("red"))
    rob.moveForward();
else if(color.equals("white"))
{
    rob.turnLeft();
    rob.moveForward();
}
else if (color.equals("black"))
{
    rob.turnRight();
    rob.moveForward();
}
```

Lego Robots

Curiosity



Lego Robots

Review

- Robot
 - Capabilities
 - Movement
 - Sensors
 - Compilation

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