Greenfoot

Introductory Programming Teaching with Greenfoot 3

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Wombats.

Object Orientation

- Early understanding of key concepts is important
    - class
    - object
    - state
    - behaviour
- Not easy without tool support
- Most important: motivation

Asteroids, Ants and other creatures.

An example

Crabs:

- little-crab-start.zip - Scenario
- Download from

www.greenfoot.org/static/workshop

Greenfoot classes

Actor

World

Greenfoot

GreenfootImage

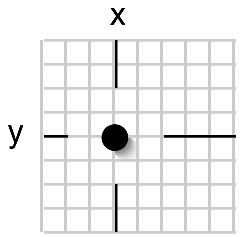
GreenfootSound

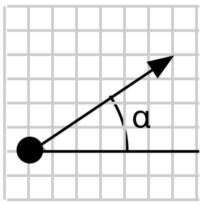
MouseInfo

Actors

'Actors' have predefined state:

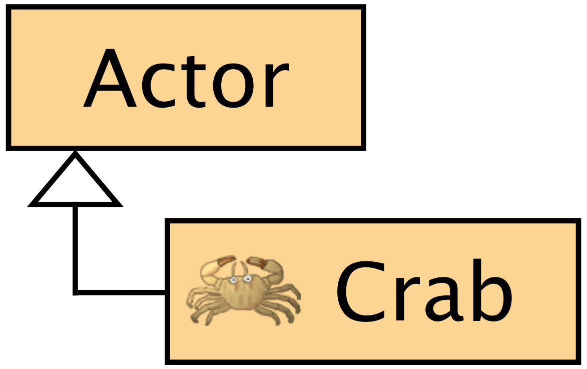
- image
- location (in the world)
- rotation





Actor methods

- act()



- getX(), getY()
- setLocation(int x, int y)
- ...

inherited from class 'Actor'

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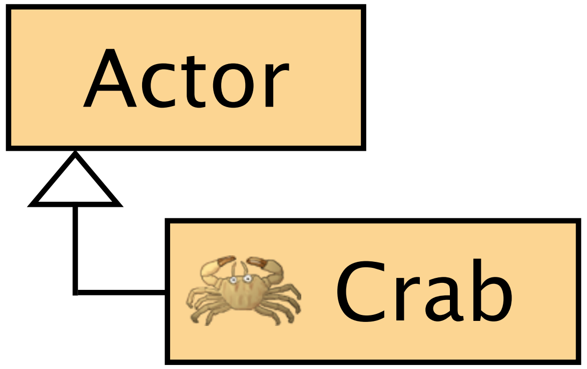
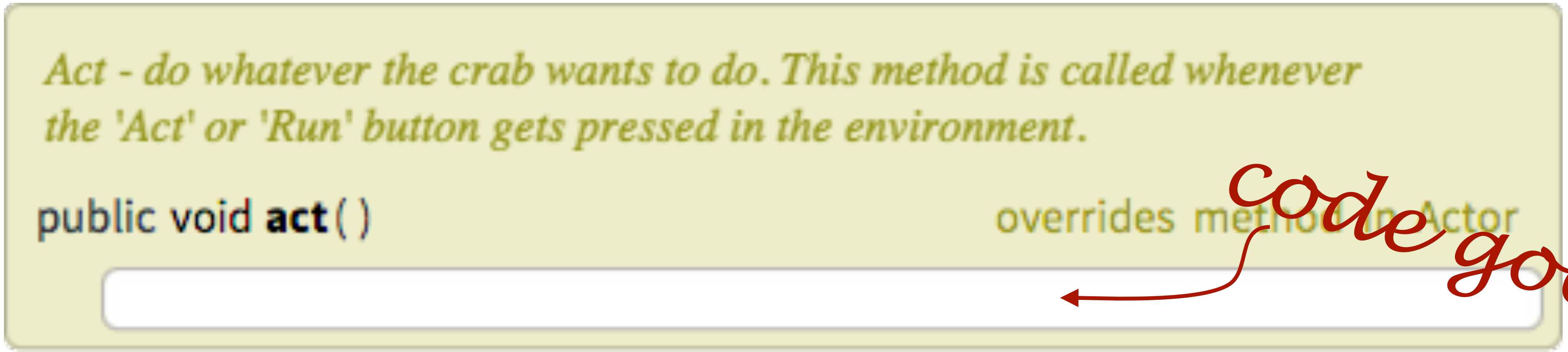
The act method



Actor

Crab

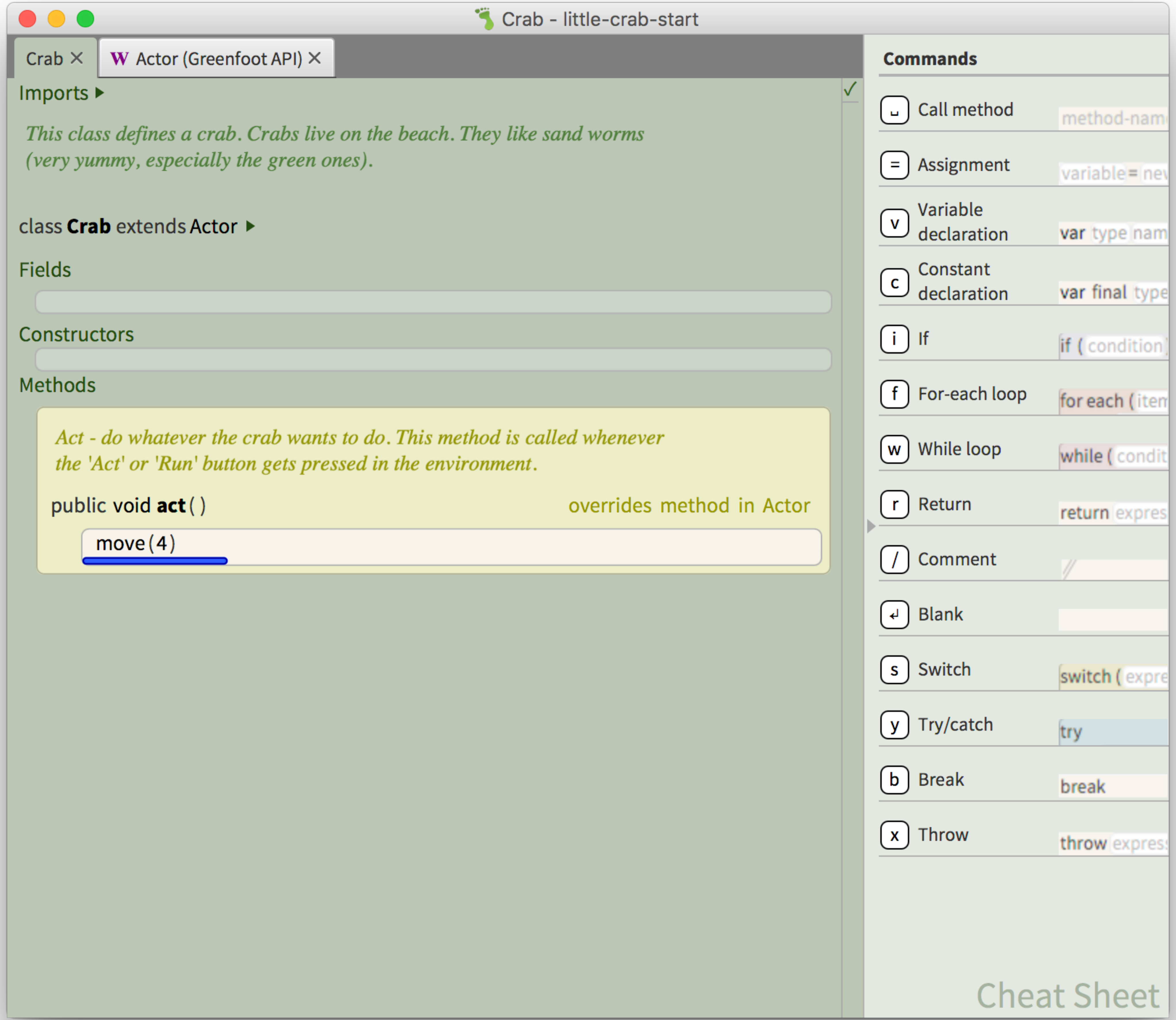


Act - do whatever the crab wants to do. This method is called whenever the 'Act' or 'Run' button gets pressed in the environment.

public void **act**( )

overrides method in Actor

code goes here


Crab - little-crab-start
Crab ✕
W Actor (Greenfoot API) ✕
✓

Imports ▸

This class defines a crab. Crabs live on the beach. They like sand worms (very yummy, especially the green ones).

class **Crab** extends Actor ▸

Fields

Constructors

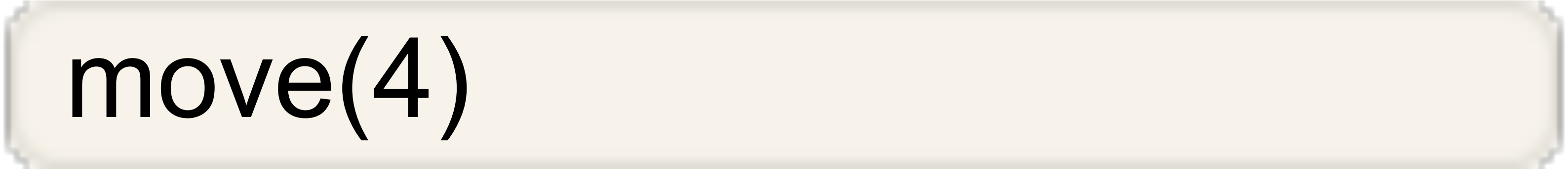
Methods

Act - do whatever the crab wants to do. This method is called whenever the 'Act' or 'Run' button gets pressed in the environment.

```
public void act ( )                         overrides method in Actor
    move (4)
```

Commands
␣ Call method method-name
= Assignment variable = new
v Variable declaration var type name
c Constant declaration var final type
i If if (condition
f For-each loop for each (item
w While loop while (condit
r Return return expres
/ Comment //
↲ Blank
s Switch switch (expre
y Try/catch try
b Break break
x Throw throw expres
Cheat Sheet

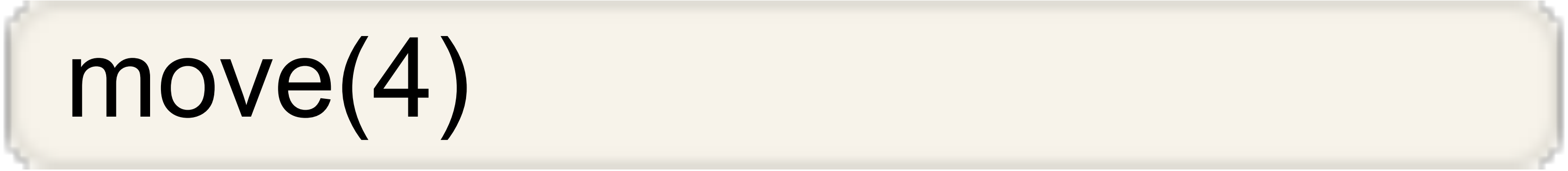
Movement



```
move(4)
```

Make your own creature

Exercises



```
move(4)
```

Method calls

method-name ()

`or`

method-name (*parameter*)

Method calls - examples

Specification:

You write:

```
void move(int distance)
```

```
move (5)
```

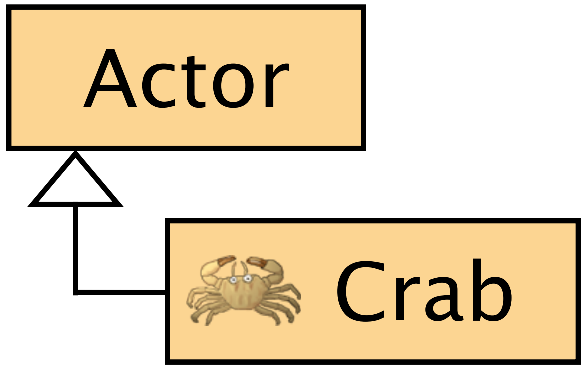
```
void turn(int angle)
```

```
turn (45)
```

```
void stop();
```

```
stop ()
```

Actor



boolean is**AtEdge()**

Method calls - examples

Specification:

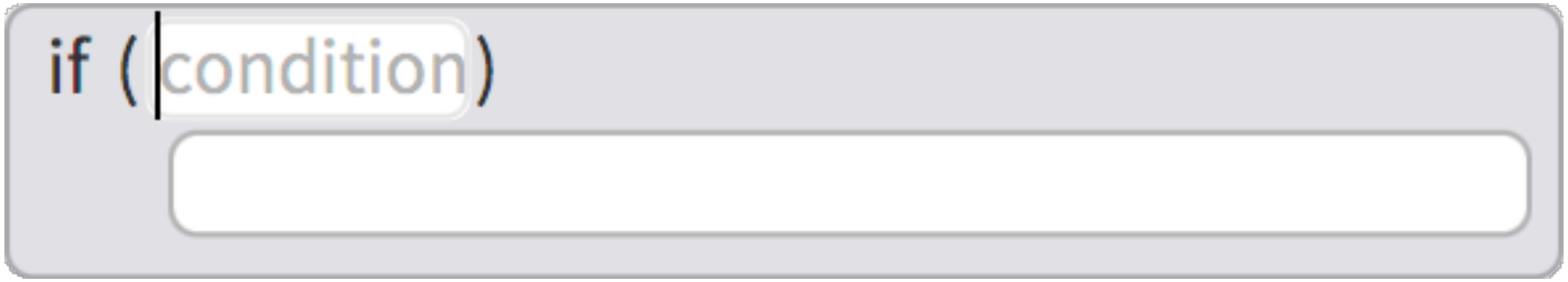
```
boolean atEdge()
```

You write:

`true` `or` **`false`** ← atEdge ()

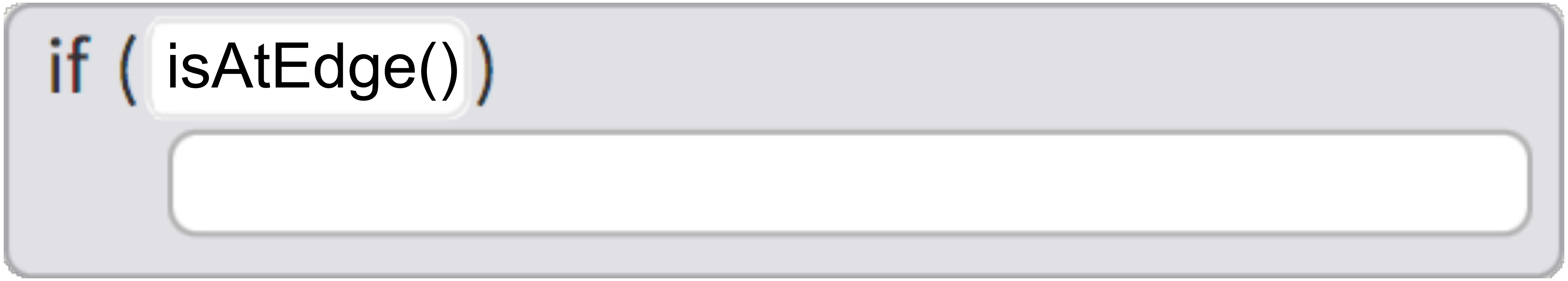
If statements

true / false



```
if (condition)
```

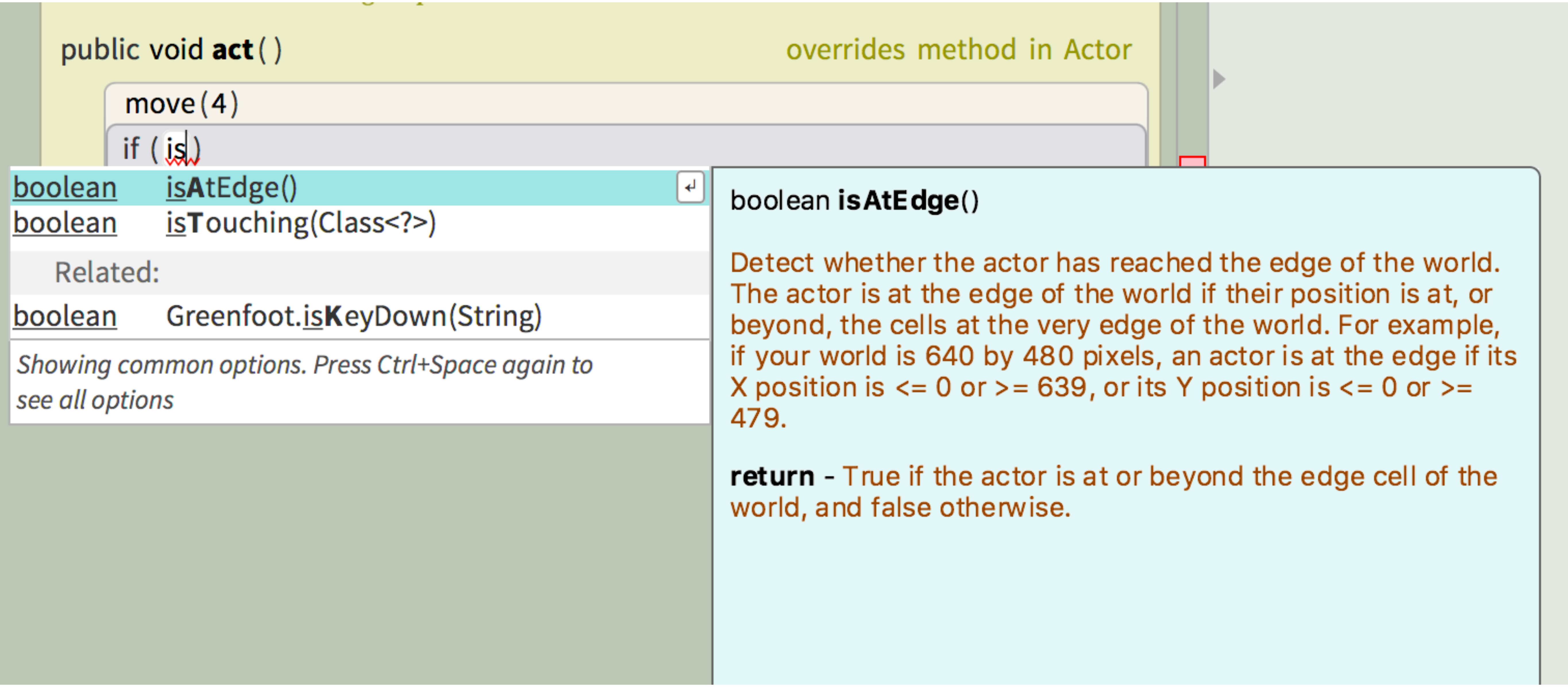
If statements



```
if ( isAtEdge() )
```

Code completion

Ctrl-Space



```
public void act ( )                                   overrides method in Actor
    move ( 4 )
    if ( is )
```

boolean	isAtEdge()
boolean	isTouching(Class<?>)
Related:	
boolean	Greenfoot.isKeyDown(String)

Showing common options. Press Ctrl+Space again to see all options

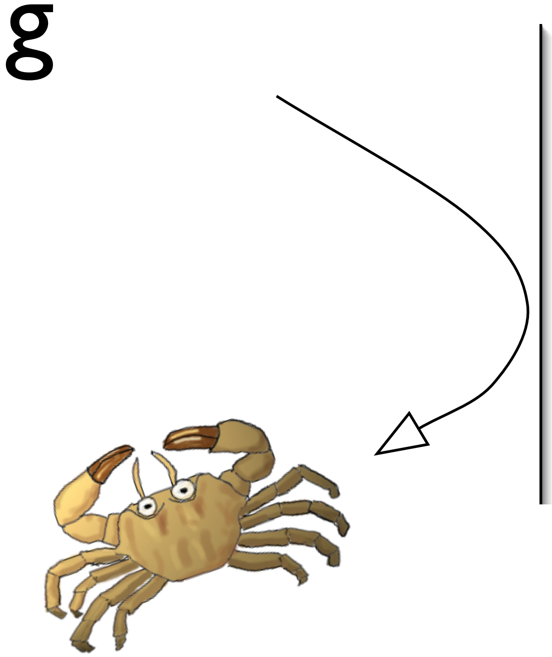
boolean **isAtEdge**()

Detect whether the actor has reached the edge of the world. The actor is at the edge of the world if their position is at, or beyond, the cells at the very edge of the world. For example, if your world is 640 by 480 pixels, an actor is at the edge if its X position is <= 0 or >= 639, or its Y position is <= 0 or >= 479.

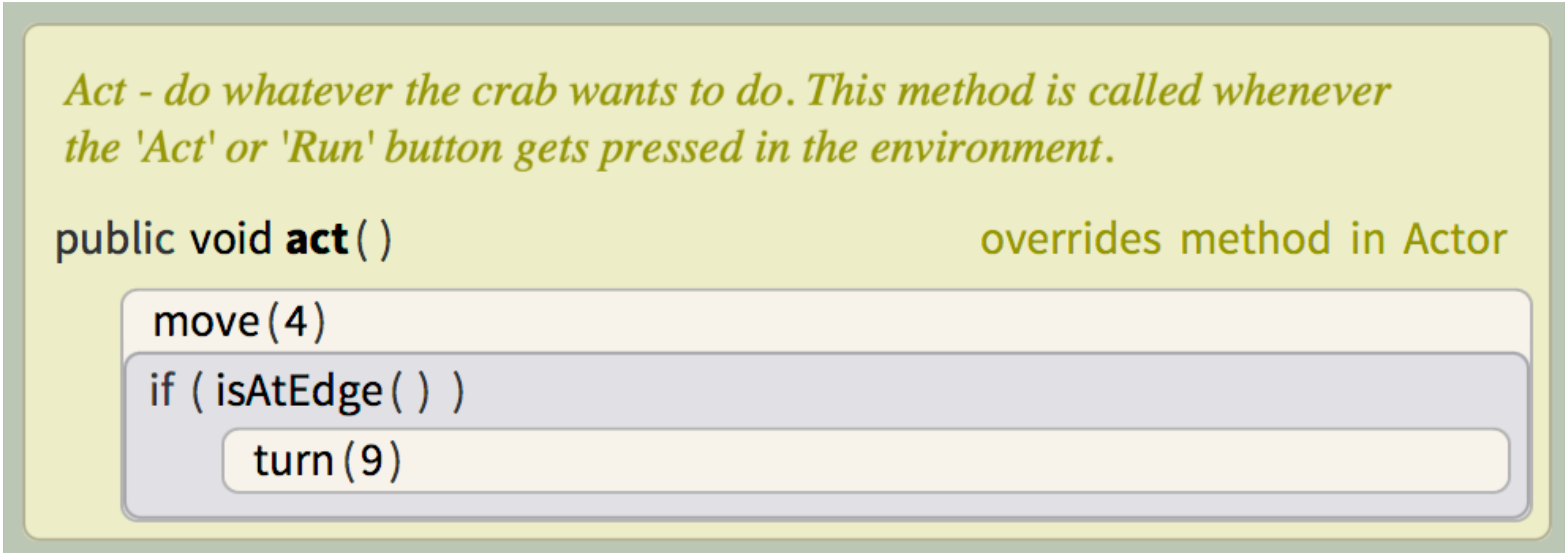
return - True if the actor is at or beyond the edge cell of the world, and false otherwise.

Exercise

- movement, edge detection, turning



Turn at edge

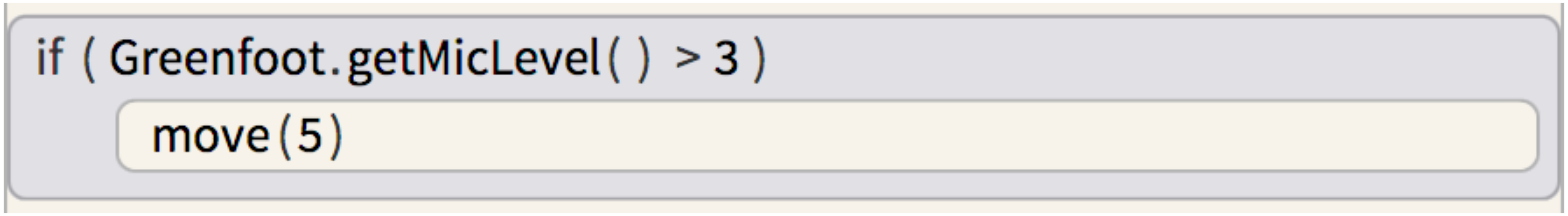


Act - do whatever the crab wants to do. This method is called whenever the 'Act' or 'Run' button gets pressed in the environment.

```
public void act ( )                                overrides method in Actor
    move (4)
    if ( isAtEdge ( ) )
        turn (9)
```

Some meta remarks...

Other options



```
if ( Greenfoot.getMicLevel( ) > 3 )
    move(5)
```

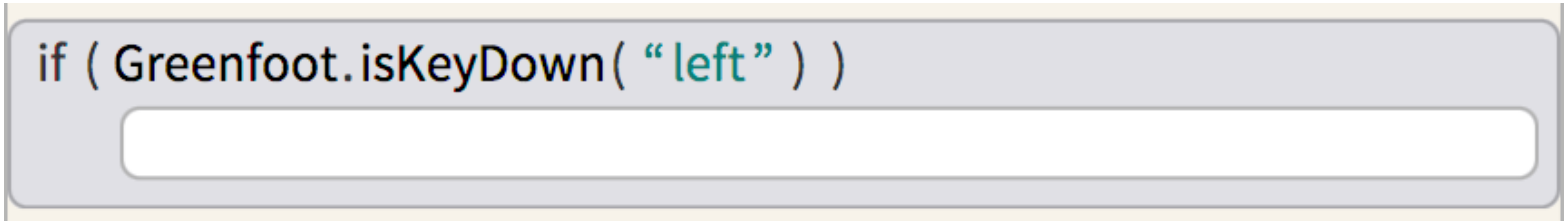
Move only when there is some noise!

Modification and ownership

- Let students take control

?

Keyboard input



```
if ( Greenfoot.isKeyDown( “left” ) )
```

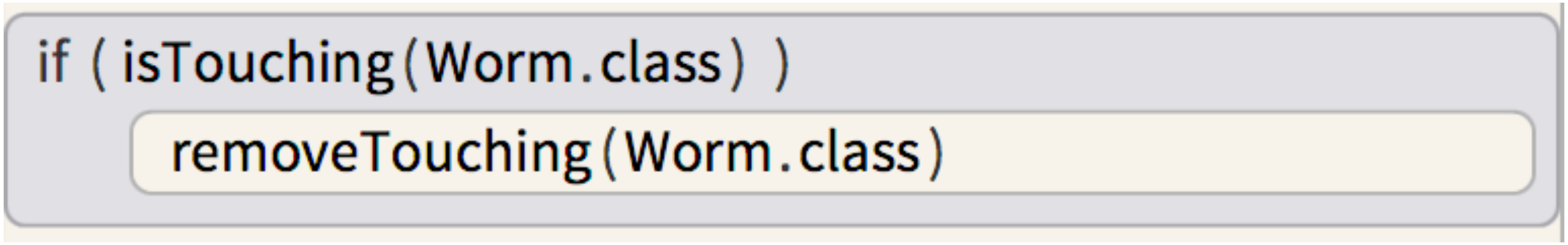
Worms...

- New subclass of *Actor:* Worm
- No behaviour needed
- Crabs eat worms... (*collision detection*)

See (from class Actor):

```
isTouching(Class clss)
removeTouching(Class clss)
```

Eating worms



```
if ( isTouching(Worm.class) )
    removeTouching(Worm.class)
```

Some meta remarks...

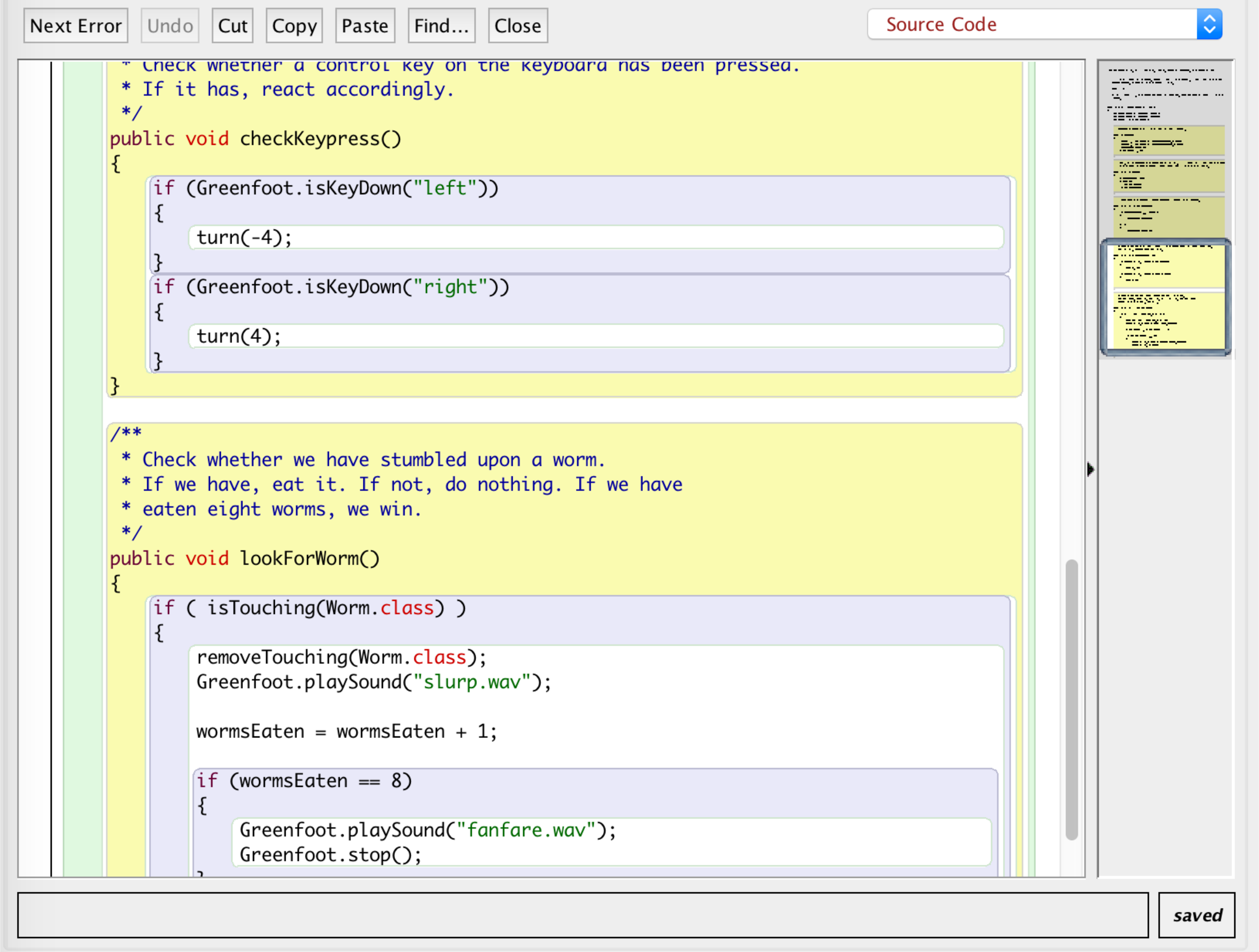
Reinforcement

- Students need practice and reinforcement
- Apply same concepts in different context

Sound

- The crab project includes a sound file:
  - "slurp.wav" (crab eats worm)

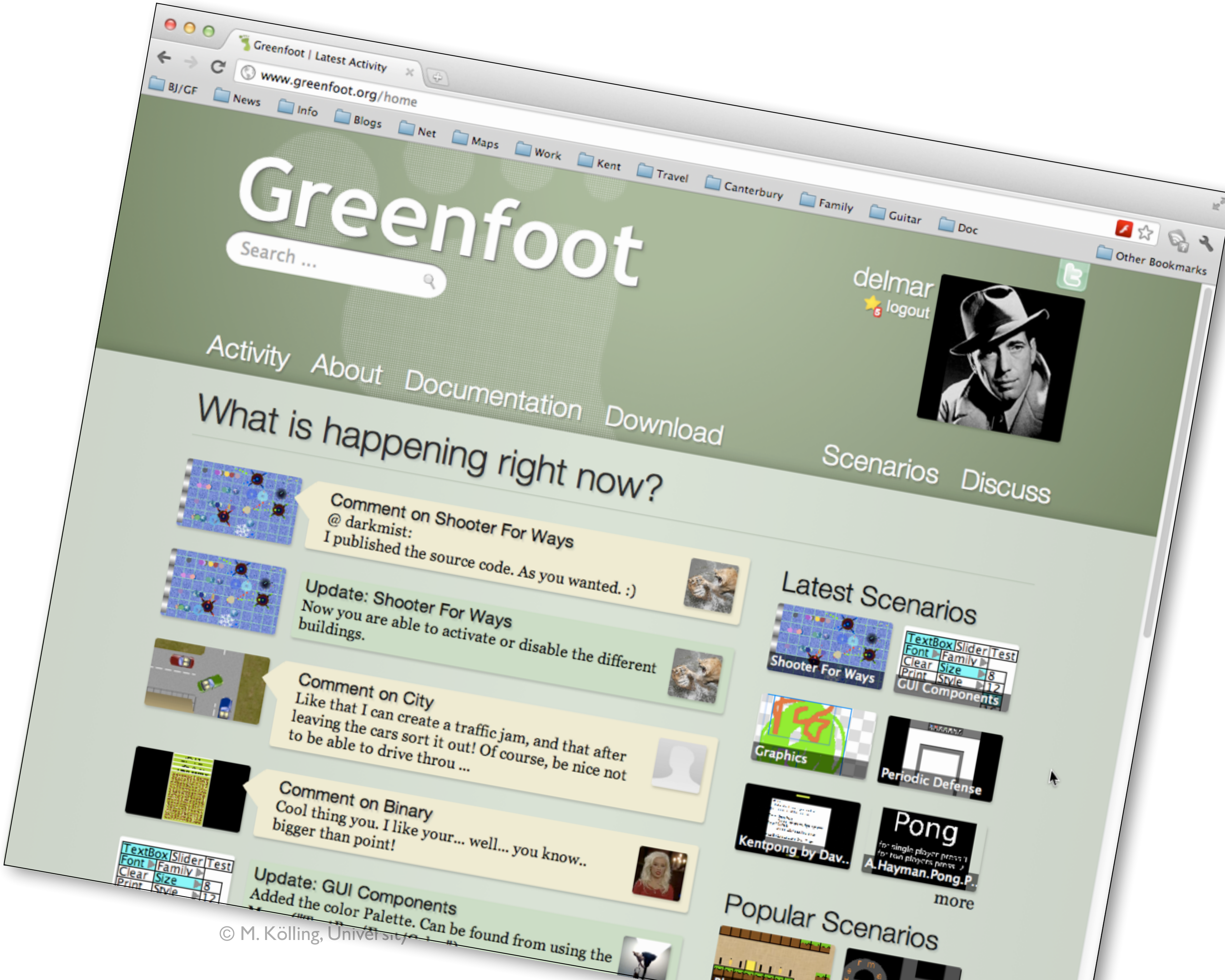
Recording sound



```
 * Check whether a control key on the keyboard has been pressed.
 * If it has, react accordingly.
 */
public void checkKeypress()
{
    if (Greenfoot.isKeyDown("left"))
    {
        turn(-4);
    }
    if (Greenfoot.isKeyDown("right"))
    {
        turn(4);
    }
}

/**
 * Check whether we have stumbled upon a worm.
 * If we have, eat it. If not, do nothing. If we have
 * eaten eight worms, we win.
 */
public void lookForWorm()
{
    if ( isTouching(Worm.class) )
    {
        removeTouching(Worm.class);
        Greenfoot.playSound("slurp.wav");

        wormsEaten = wormsEaten + 1;

        if (wormsEaten == 8)
        {
            Greenfoot.playSound("fanfare.wav");
            Greenfoot.stop();
        }
```

Greenfoot Gallery

- Share!



Greenfoot | Latest Activity

www.greenfoot.org/home

Greenfoot

Search ...

delmar
logout

What is happening right now?

Comment on Shooter For Ways
@ darkmist:
I published the source code. As you wanted. :)

Update: Shooter For Ways
Now you are able to activate or disable the different buildings.

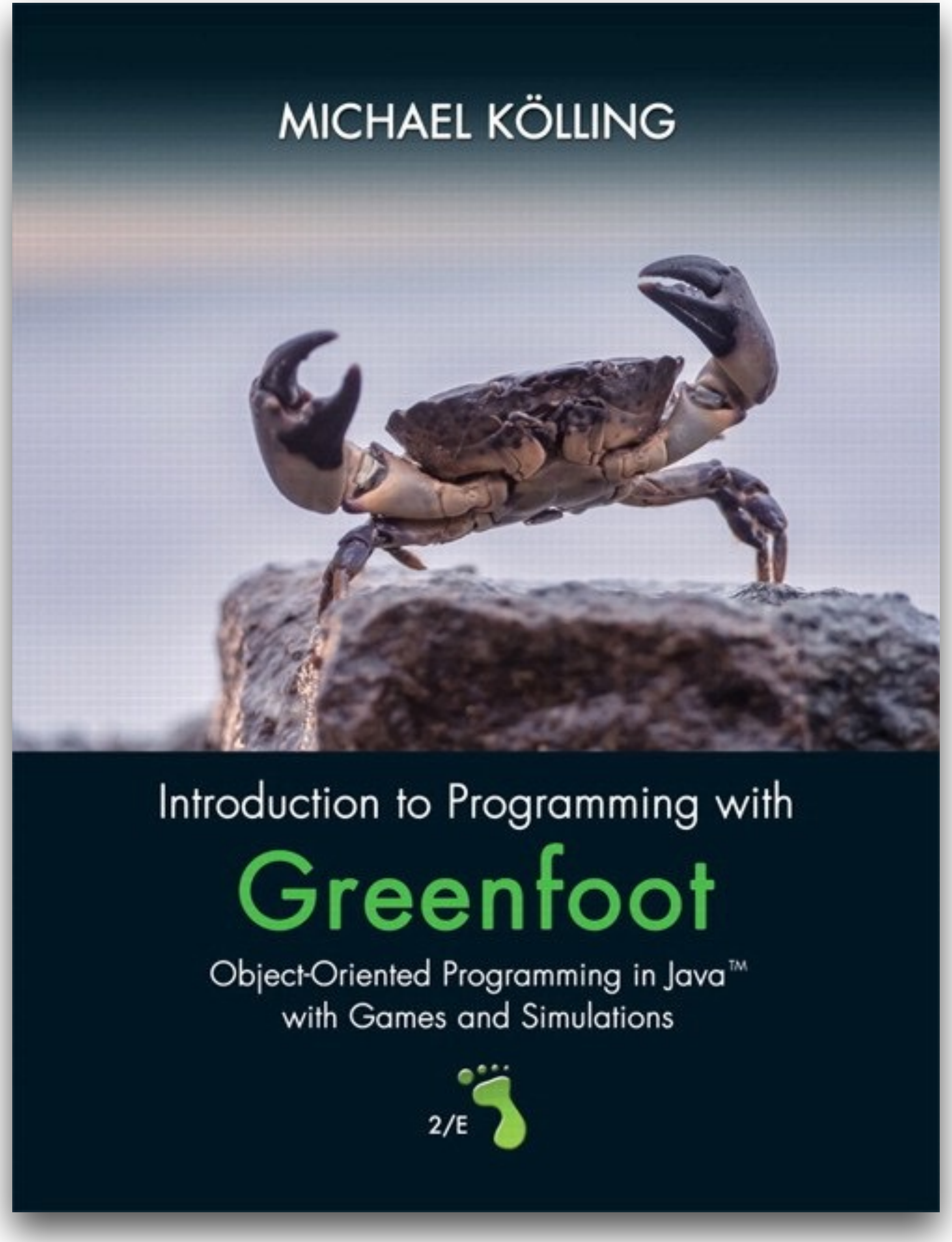
Comment on City
Like that I can create a traffic jam, and that after leaving the cars sort it out! Of course, be nice not to be able to drive throu ...

Comment on Binary
Cool thing you. I like your... well... you know.. bigger than point!

Update: GUI Components
Added the color Palette. Can be found from using the

Latest Scenarios

Popular Scenarios



MICHAEL KÖLLING

Introduction to Programming with

Greenfoot

Object-Oriented Programming in Java™
with Games and Simulations

2/E

Workshop slides

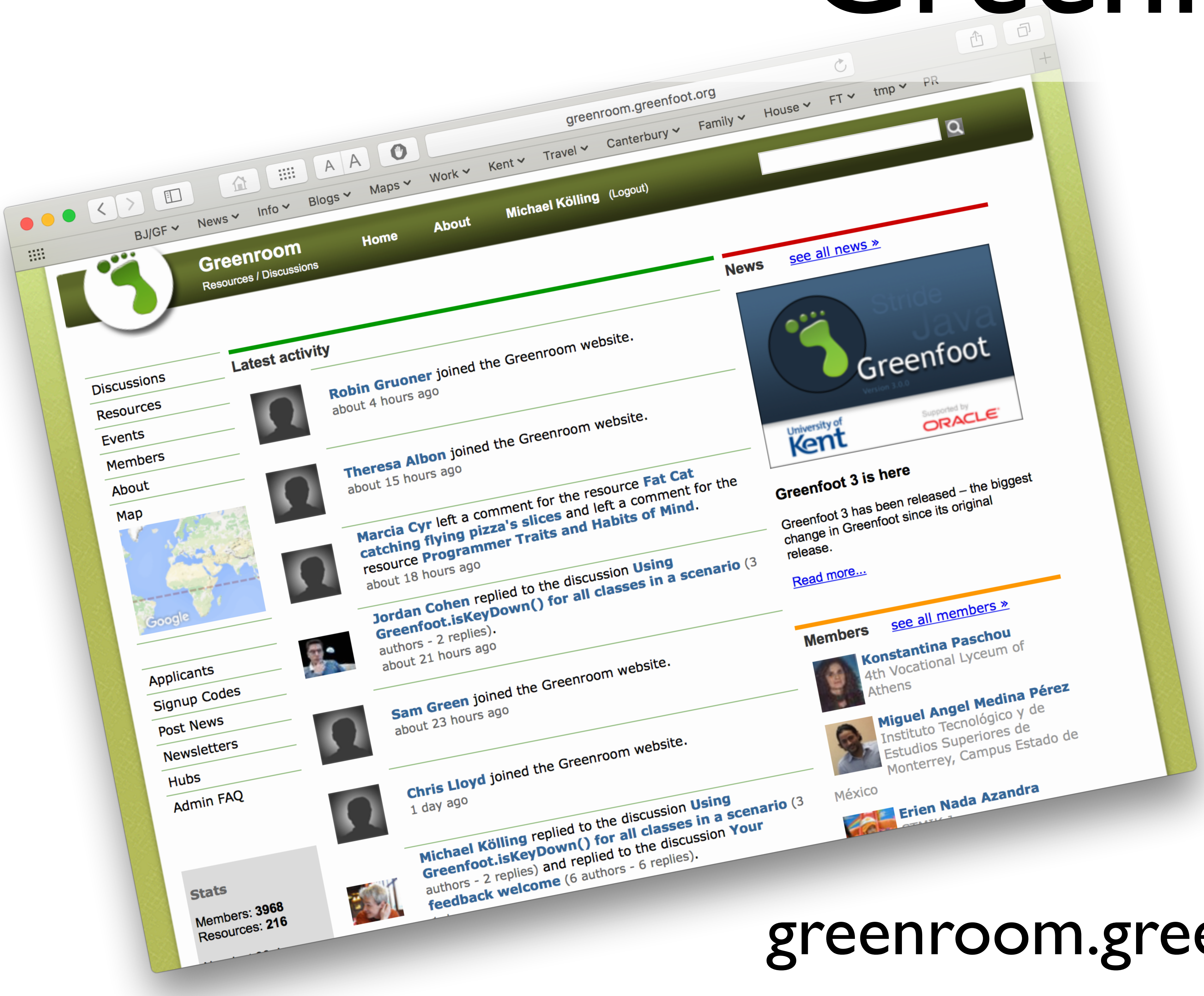
- www.greenfoot.org/static/workshop

Joy of Code videos

https://www.youtube.com/user/18km

Greenroom

- Meet!



Stats
Members: 3968
Resources: 216

Latest activity

Robin Gruoner joined the Greenroom website.
about 4 hours ago

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about 15 hours ago

Marcia Cyr left a comment for the resource Fat Cat catching flying pizza's slices and left a comment for the resource Programmer Traits and Habits of Mind.
about 18 hours ago

Jordan Cohen replied to the discussion Using Greenfoot.isKeyDown() for all classes in a scenario (3 authors - 2 replies).
about 21 hours ago

Sam Green joined the Greenroom website.
about 23 hours ago

Chris Lloyd joined the Greenroom website.
1 day ago

Michael Kölling replied to the discussion Using Greenfoot.isKeyDown() for all classes in a scenario (3 authors - 2 replies) and replied to the discussion Your feedback welcome (6 authors - 6 replies).

News see all news »

Greenfoot 3 is here

Greenfoot 3 has been released – the biggest change in Greenfoot since its original release.

Read more...

Members see all members »

Konstantina Paschou
4th Vocational Lyceum of Athens

Miguel Angel Medina Pérez
Instituto Tecnológico y de Estudios Superiores de Monterrey, Campus Estado de México

Erien Nada Azandra

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