Greenfoot Workshop

Bobby - Snake

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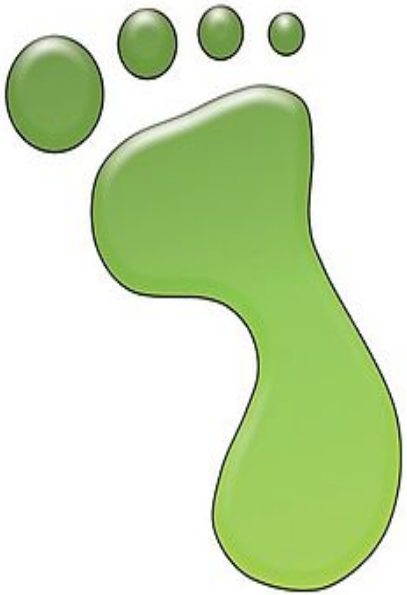
Greenfoot



- **Ontwikkelomgeving** gebaseerd op de **Java programmeertaal**.
- Is gemaakt om de **Java taal te leren kennen**.
- Gemakkelijk om **2D games** te maken.
- Greenfoot is gratis beschikbaar voor Microsoft Windows, Mac OS X, and Linux.
- http://www.greenfoot.org/

De Java taal

- « Object georienteerd » taal
- Eén van de meest gebruikte programmeertalen te wereld
- Ontwikkelen van applicaties voor verschillende systemen
  - Windows, Mac, Linux, Android, …

« Object Georienteerd »

- Java applicaties bestaan uit « **Objecten** »

- Elk Object bestaat uit 2 delen:
  - zijn eigenschappen
  - zijn « gedrag », de acties die het object kan doen

Klassen en Objecten

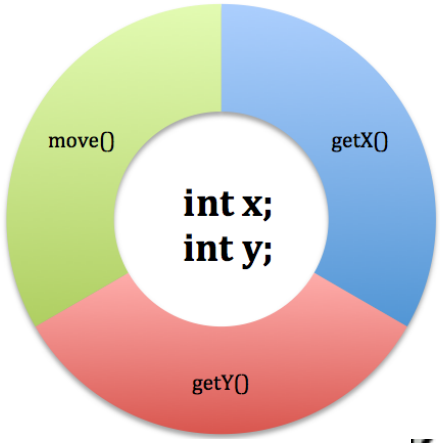
- Om een **object** te beschrijven,definieren we een **klasse**.

Een **klasse** is een « **model** » waarmee we **objecten** bouwen.

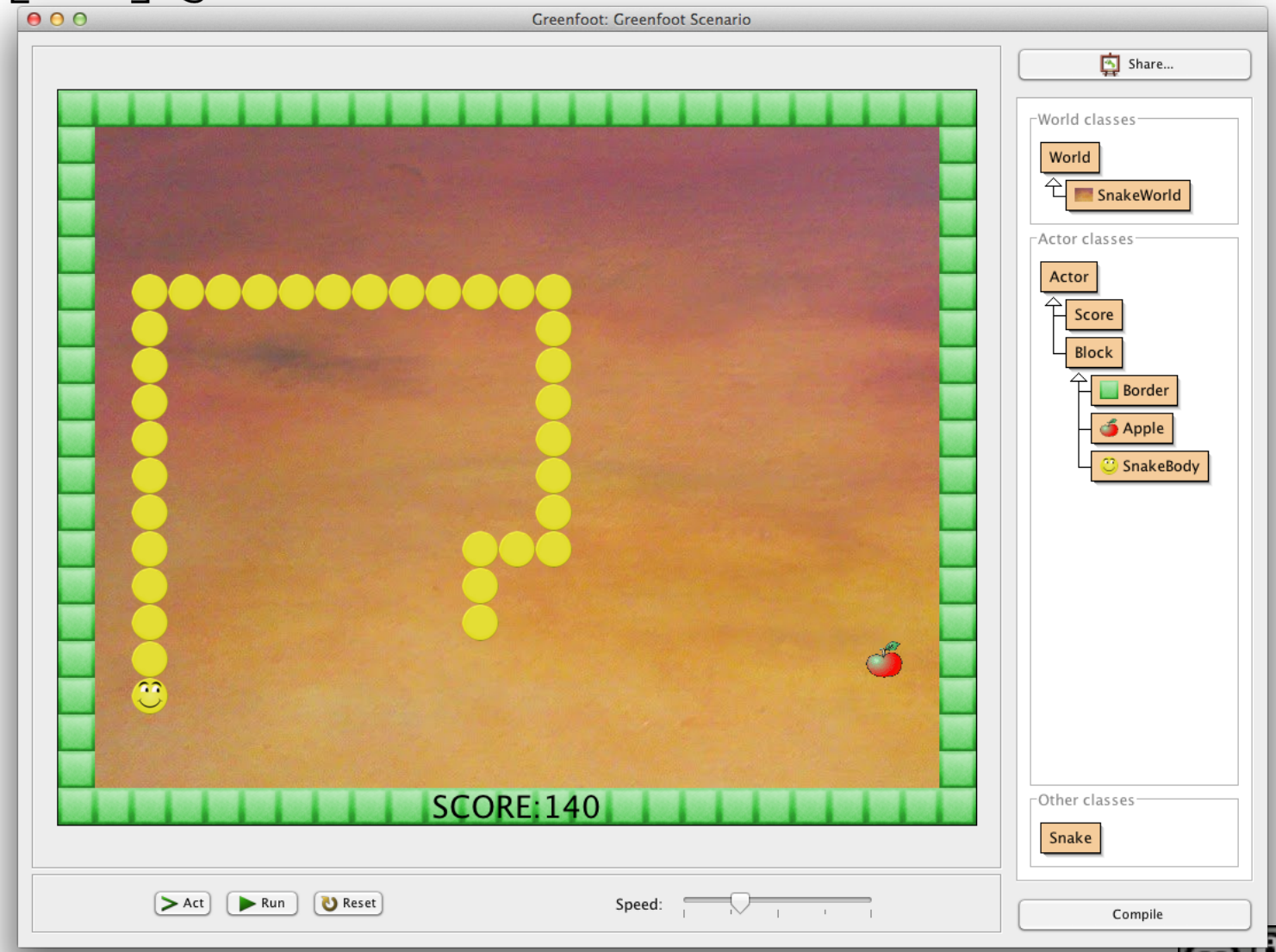
- We kunne ook zeggen dat objecten « instanties » van de klasse zijn.

Voorbeeld van een Java klasse

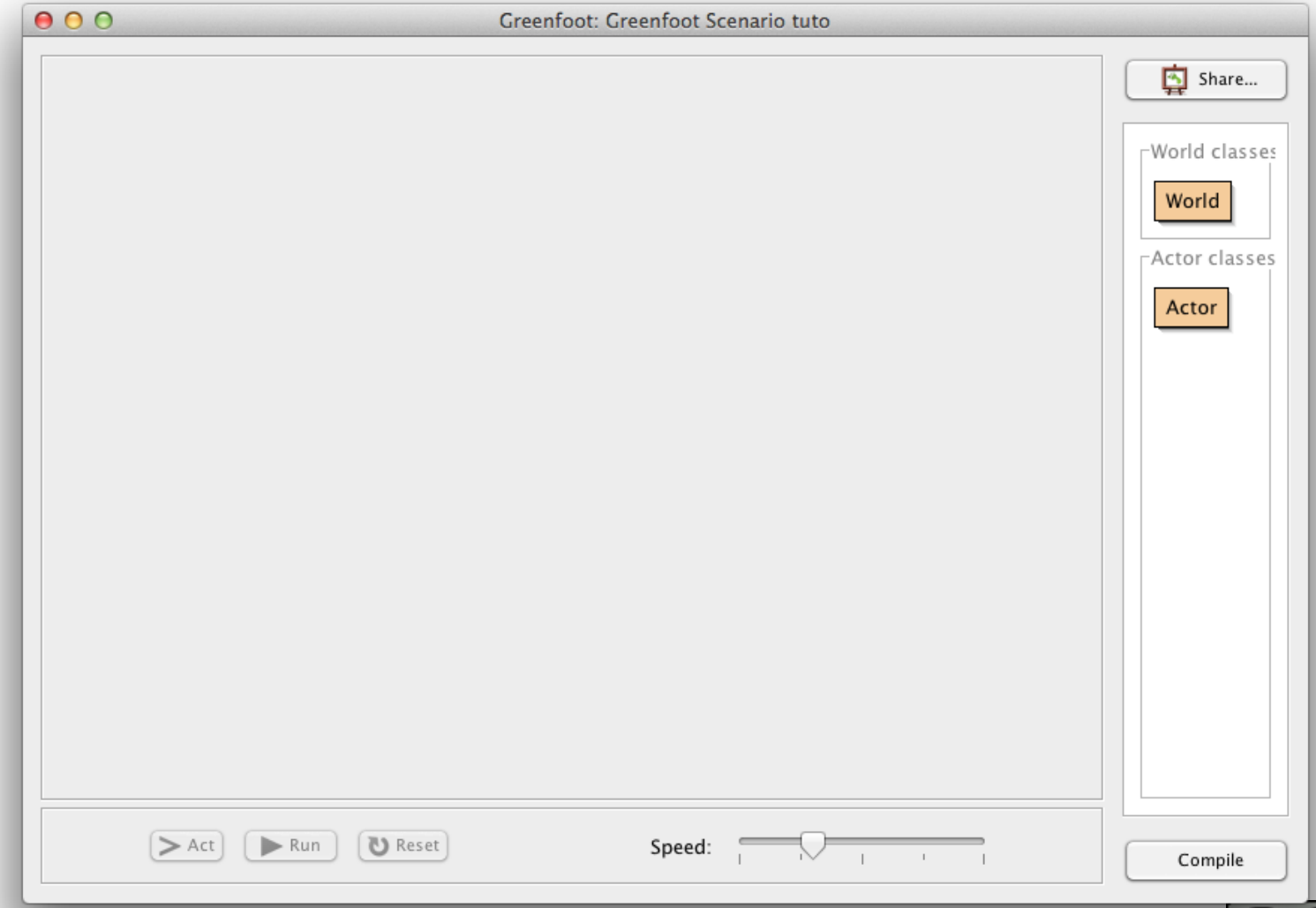
```
public class GameElement {
        private int x;
        private int y;
        public GameElement(int initX, int initY) {
                x = initX;
                y = initY;
        }

        public int getX() {
                return x;
        }

        public int getY() {
                return y;
        }

        public void move(int xMove, int yMove) {
                x = x + xMove;
                y = y + yMove;
        }
}
```



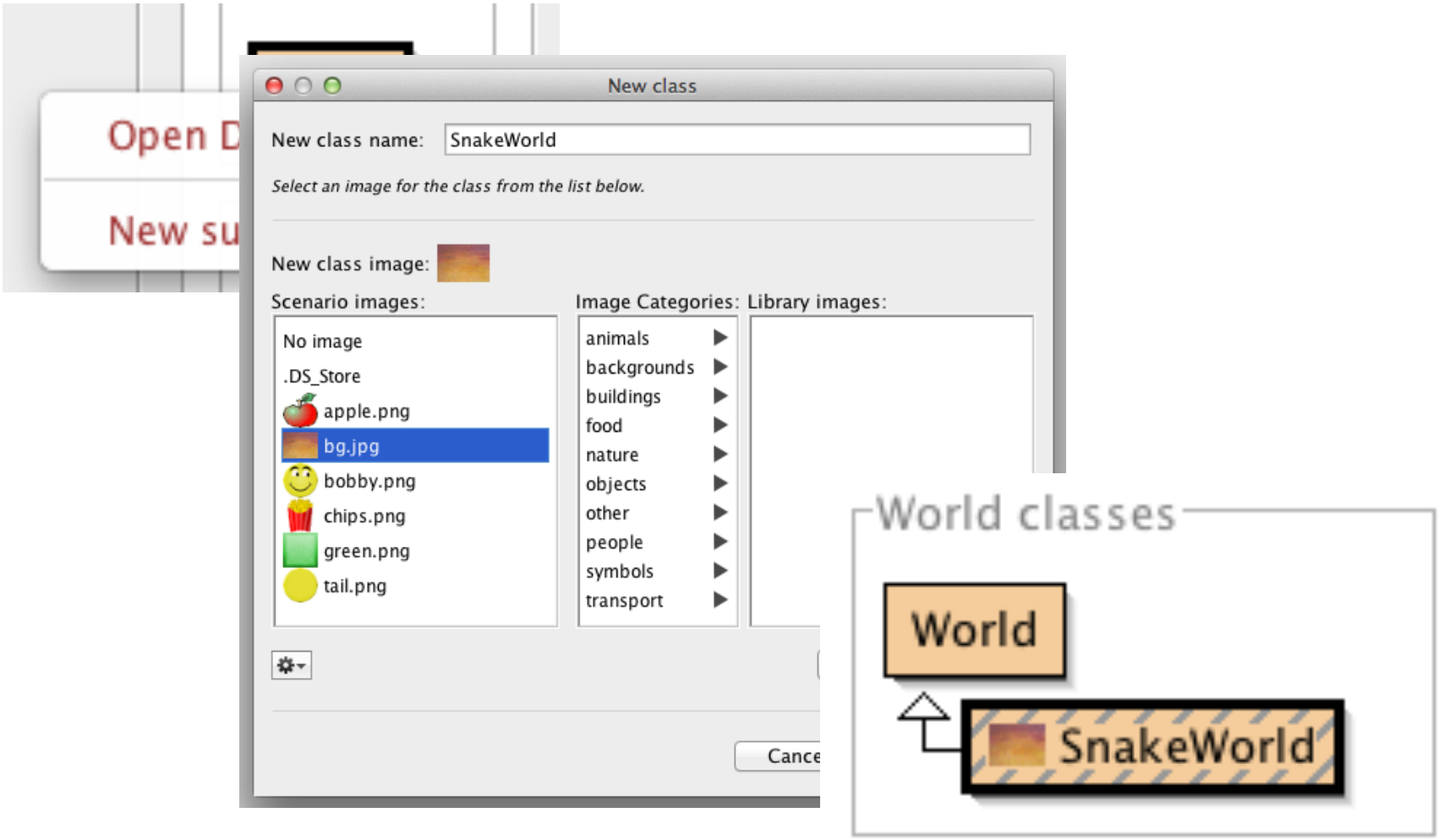
Bobby-Snake


Greenfoot: Greenfoot Scenario
Share...
World classes
World
SnakeWorld
Actor classes
Actor
Score
Block
Border
Apple
SnakeBody
Other classes
Snake
SCORE:140
Act
Run
Reset
Speed:
Compile

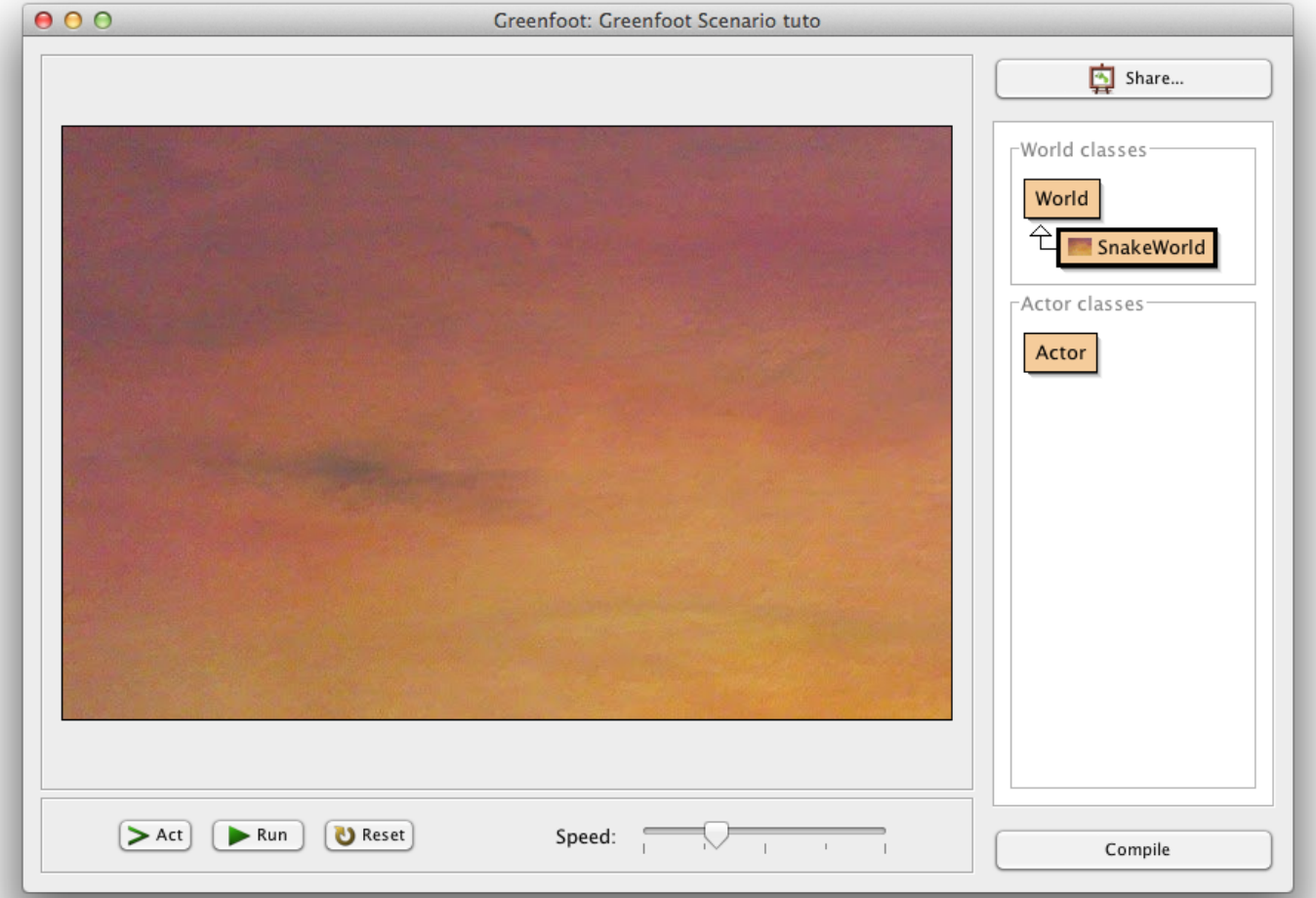
Nieuw scenario



Wereld creëren



SnakeWorld



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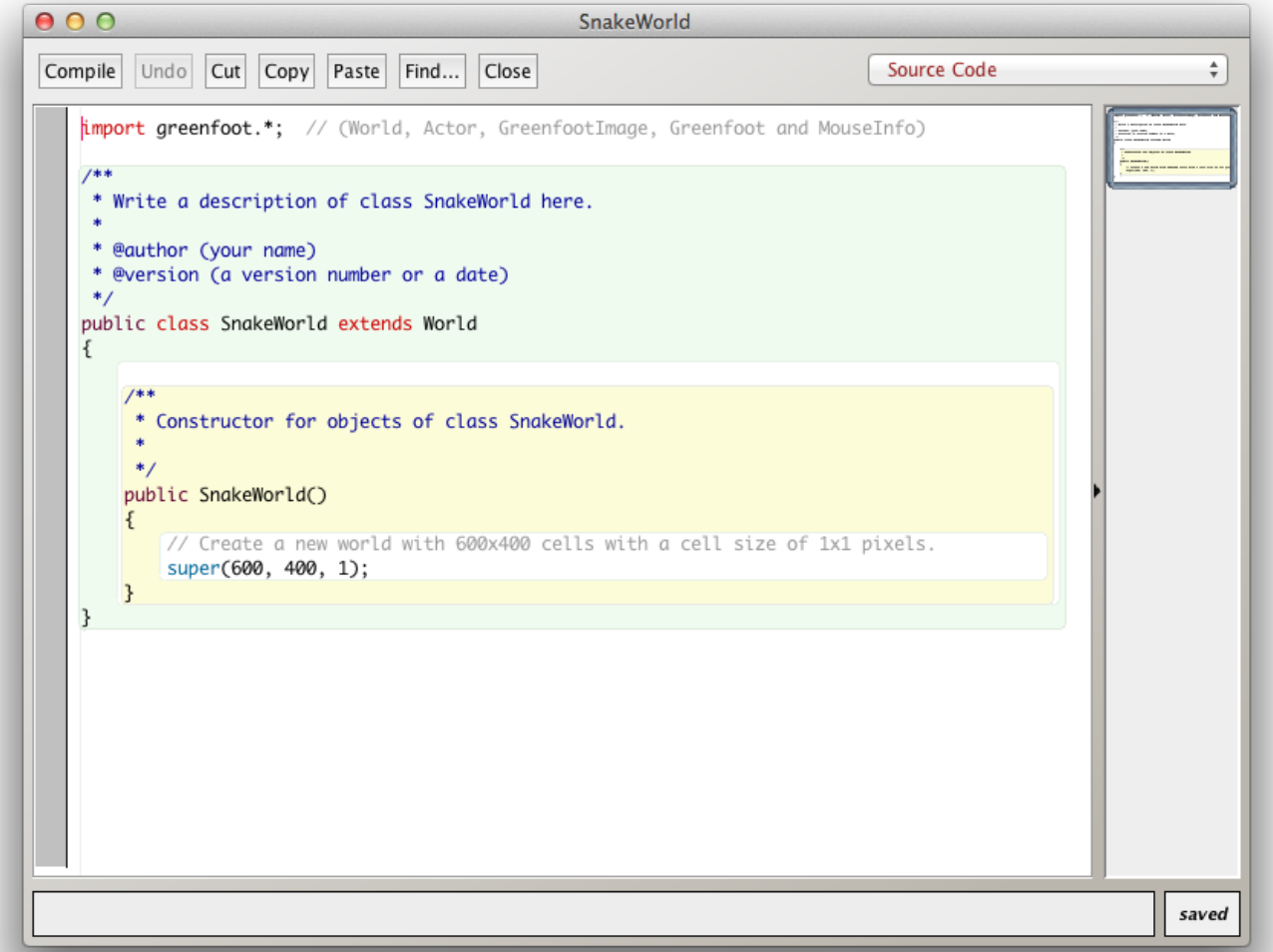
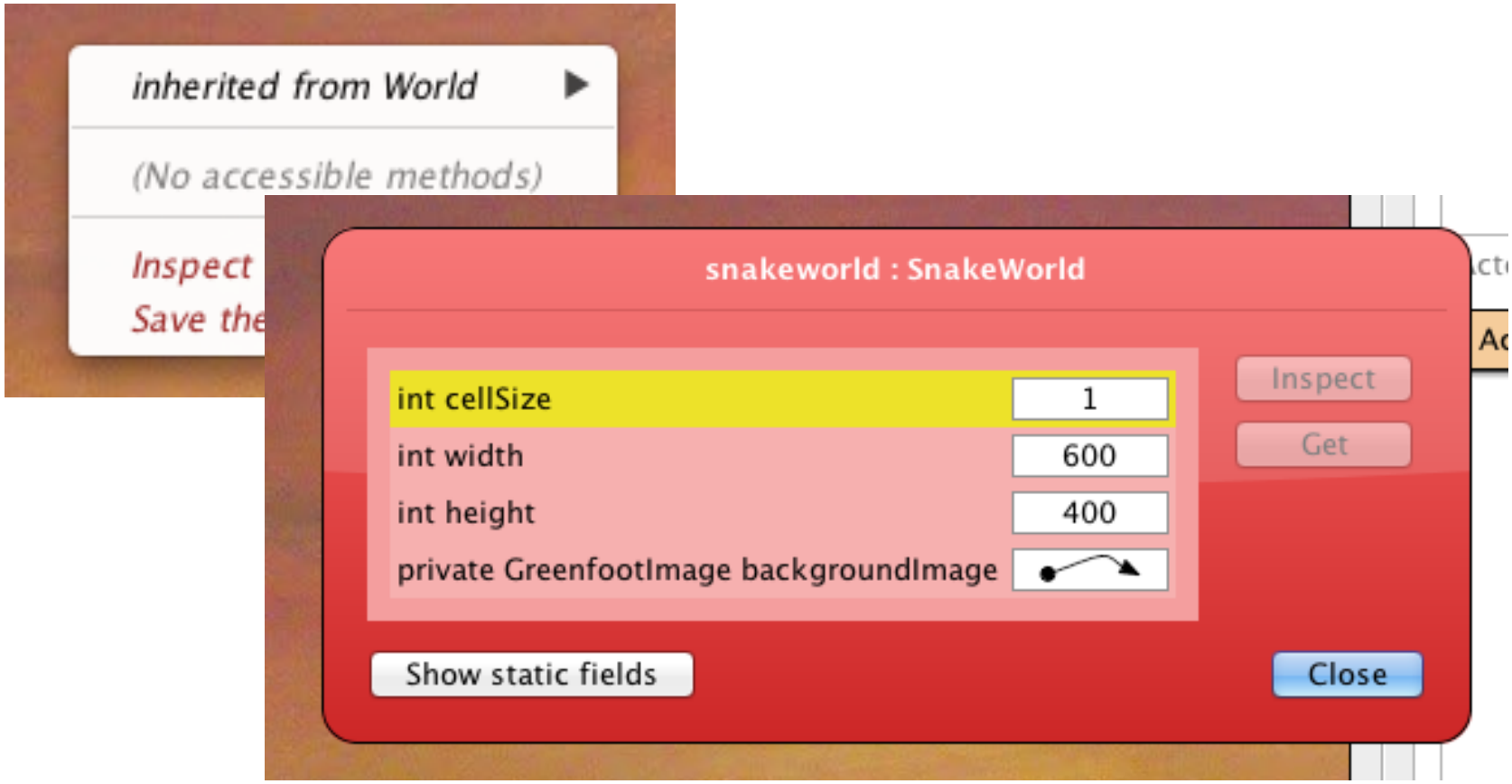
SnakeWorld code



Bekijk World

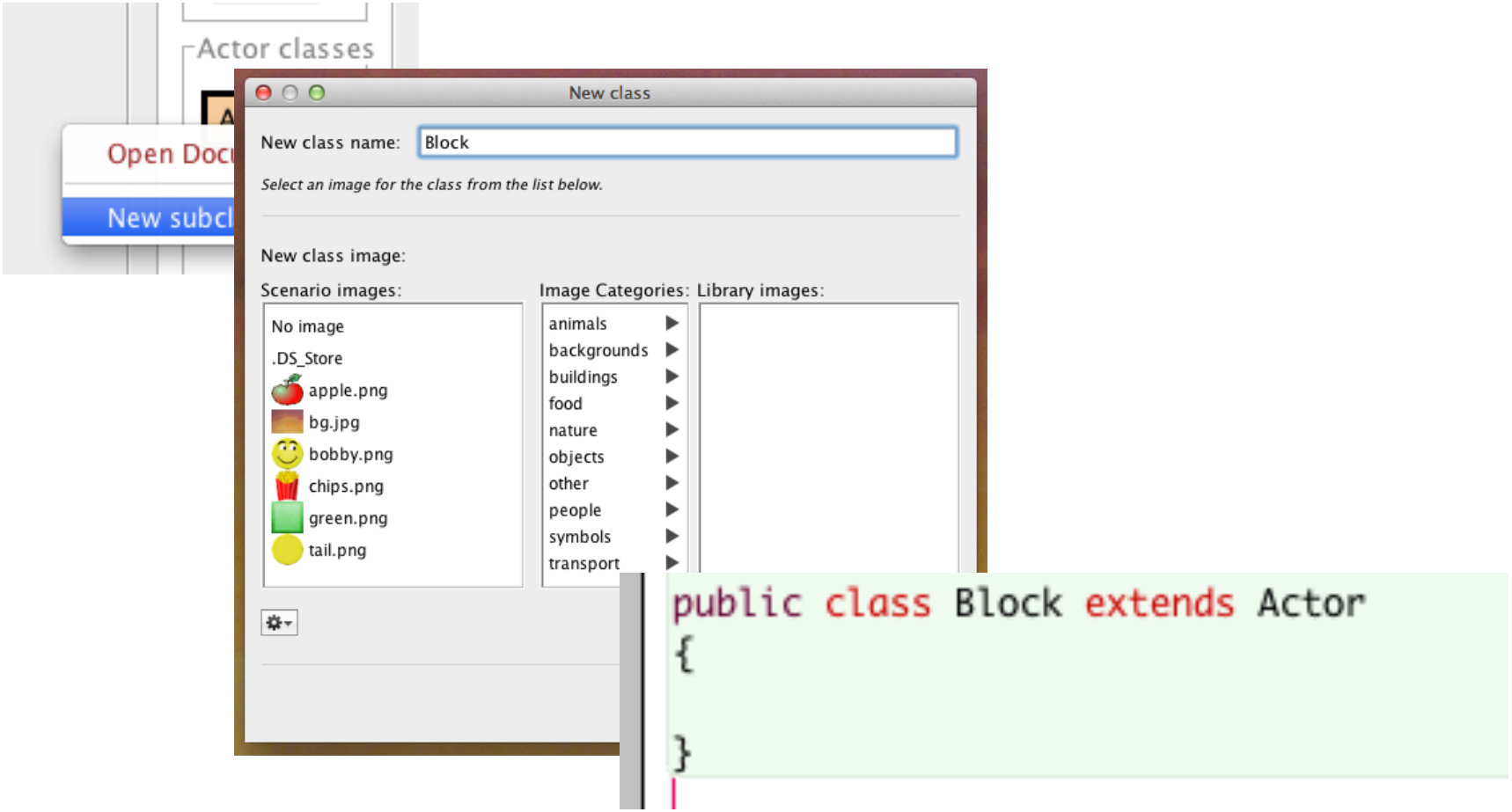


Verander de code

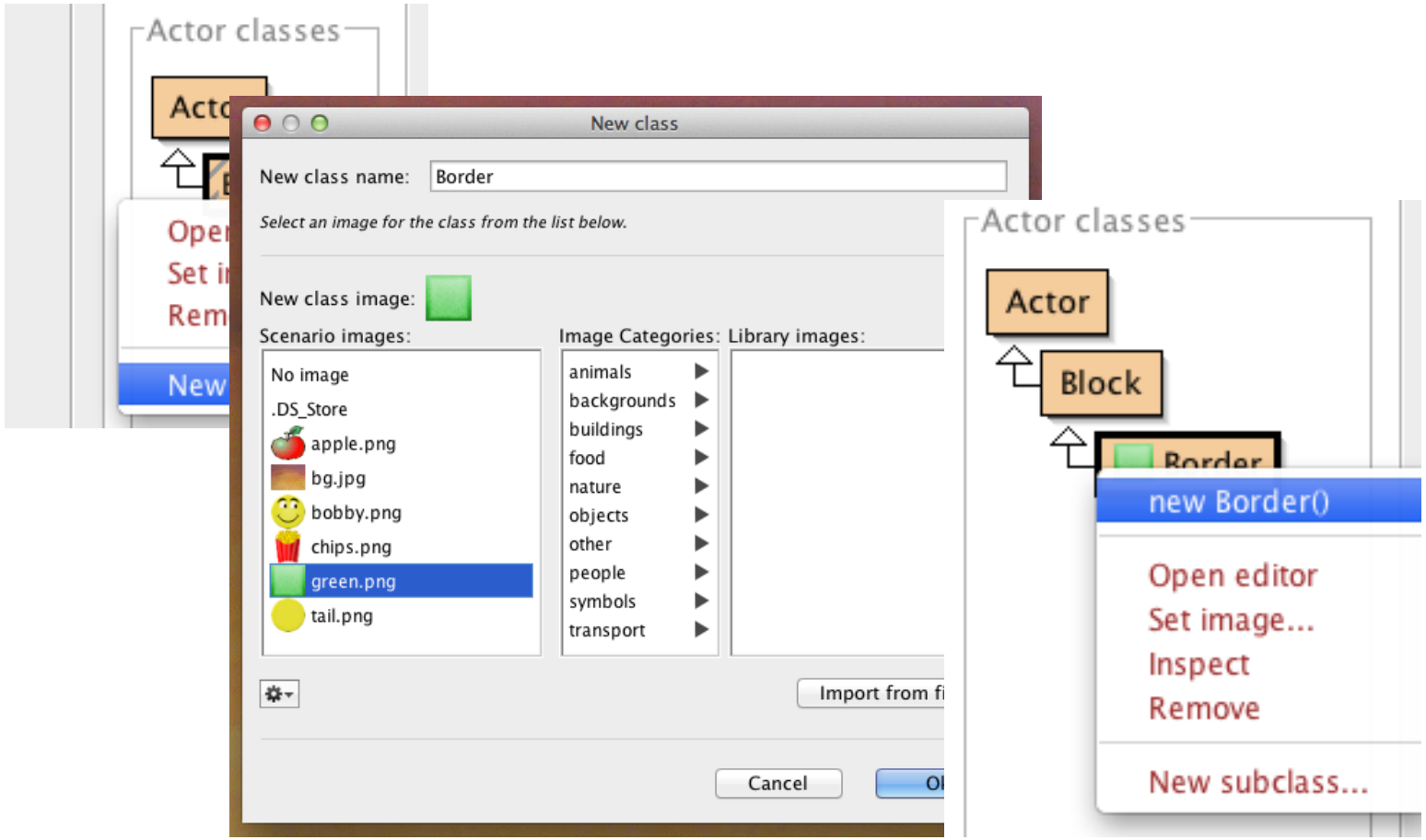
- We gebruiken blokken van 32x32 pixels
- De grootte van het spel is 25 x 20 blocks

```
/**
 * Constructor for objects of class SnakeWorld.
 *
 */
public SnakeWorld()
{
    super(25, 20, 32);
```

Maak een blok



Maak de spelrand



Coördinaten

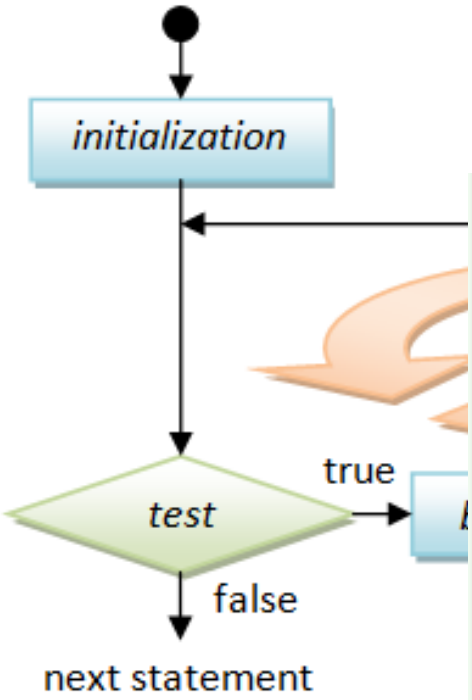
(0,0)	(1,0)	(2,0)	…	(24,0)
(0,1)	(1,1)	(2,1)	…	(24,1)
(0,2)	(1,2)	(2,2)	…	(24,2)
…	…	…	…	…
(0,19)	(1,19)	(2,19)	…	(24,19)

Toon de spelrand

```
public SnakeWorld()
{
    super(25, 20, 32);
    addObject(new Border(), 0, 0);
}
```

for lussen

for (*initialization* **;** *test* **;** *post-processing* **) {**
    body **;**
}



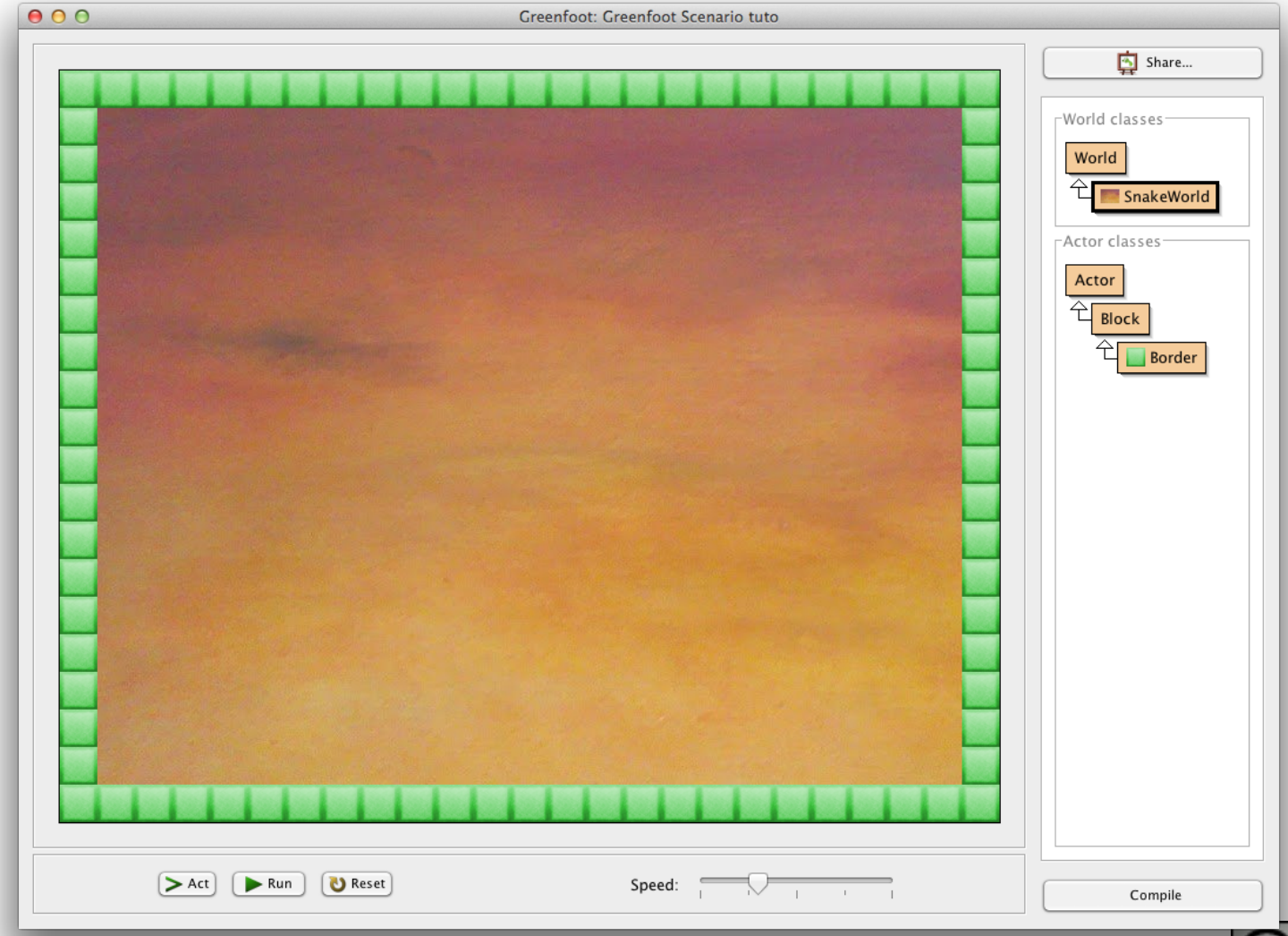

```
public SnakeWorld()
{
    super(25, 20, 32);

    for (int x = 0; x < getWidth(); x ++ ) {
        addObject(new Border(), x, 0);
        addObject(new Border(), x, getHeight()-1);
    }

    for (int y = 0; y < getHeight(); y ++) {
        addObject(new Border(), 0, y);
        addObject(new Border(), getWidth()-1, y);
    }

}
```

De spelrand



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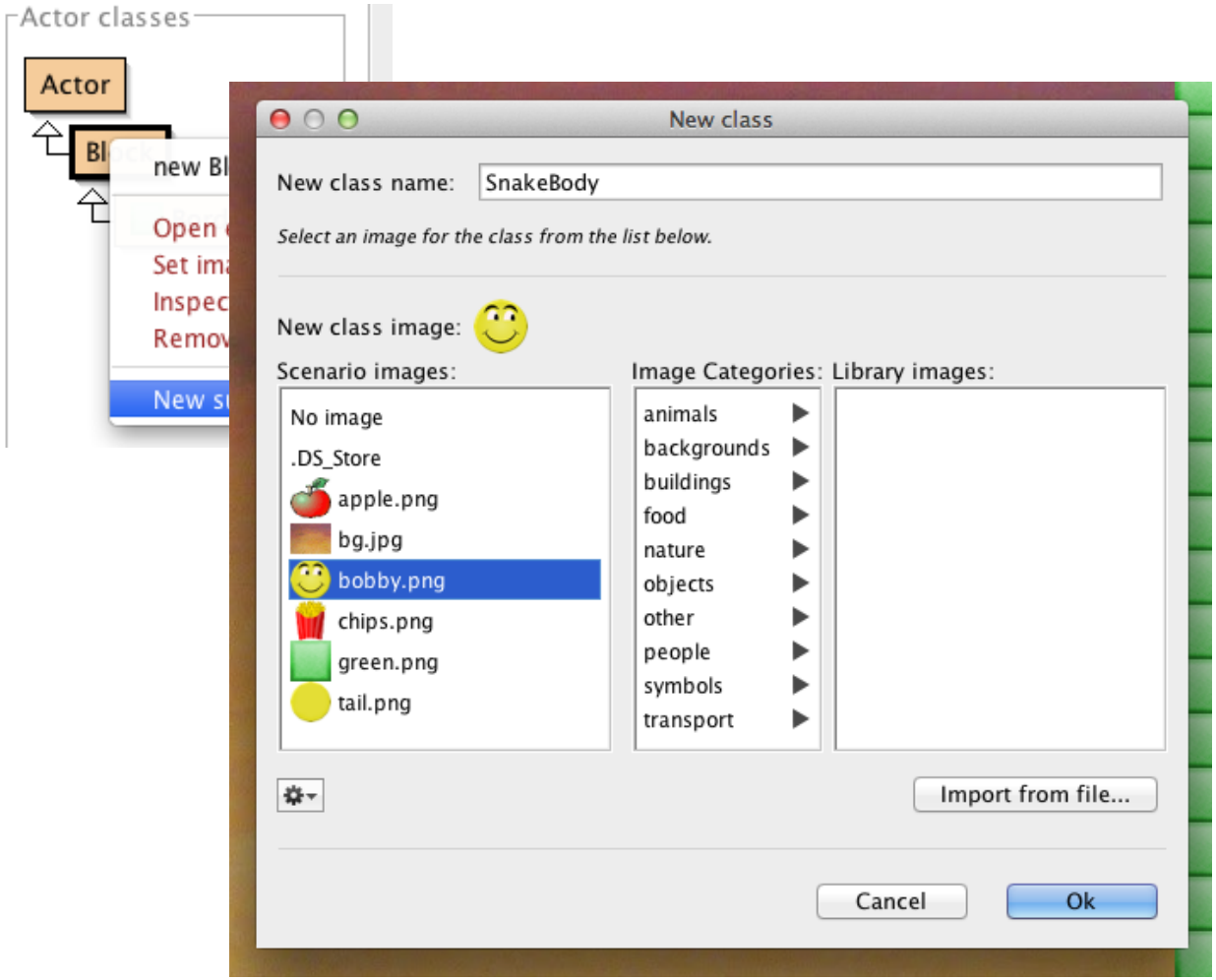
Klasse SnakeBody



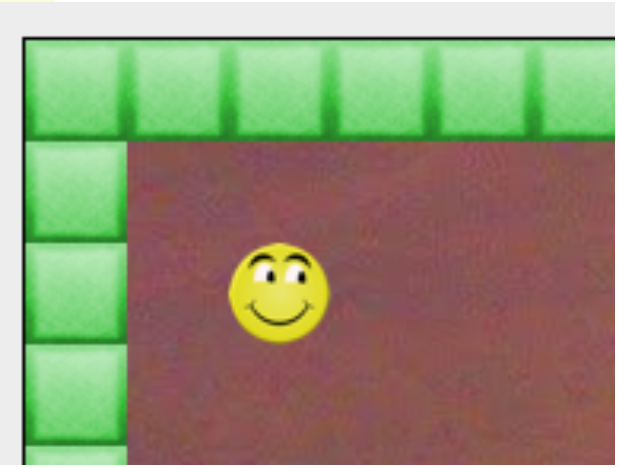
SnakeWorld veranderingen

```
public class SnakeWorld extends World
{
    private LinkedList<SnakeBody> snake = new LinkedList<SnakeBody>();
```

```
import greenfoot.*;
import java.util.*;
```

```
public SnakeWorld()
{
    super(25, 20, 32);

    SnakeBody body = new SnakeBody();
    snake.add(body);
    addObject(body, 2, 2);
```



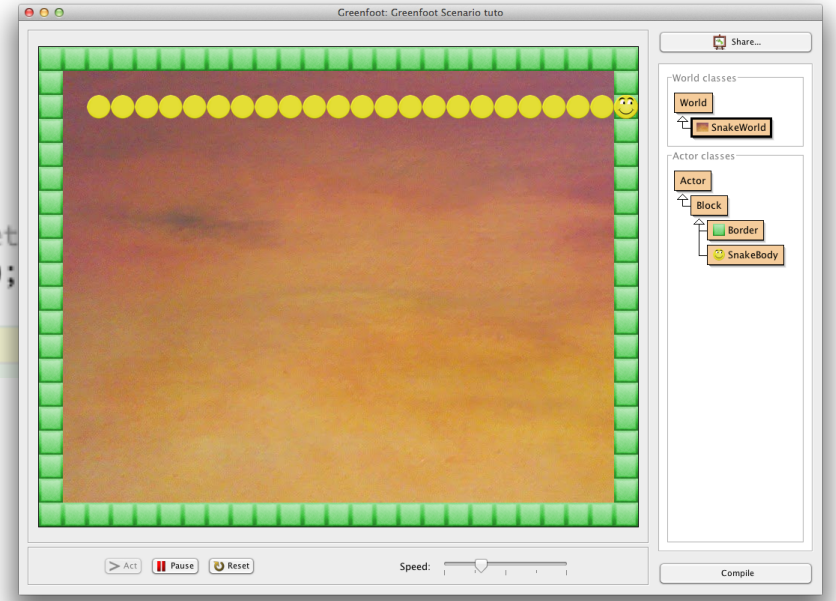
Beweging

```
public class SnakeWorld extends World
{
    private LinkedList<SnakeBody> snake = new LinkedList<SnakeBody>();
    private int dx = 1;
    private int dy = 0;
```

```
public void act()
{
  //on remplace l'image de la tête
  SnakeBody head = snake.getLast();
  head.setImage("tail.png");

  //crée une nouvelle tête
  SnakeBody newHead = new SnakeBody();
  int newHeadX = head.getX()+dx;
  int newHeadY = head.getY()+dy;

  //ajoute la nouvelle tête à la liste et
  addObject(newHead, newHeadX, newHeadY);
  snake.add(newHead);
}
```



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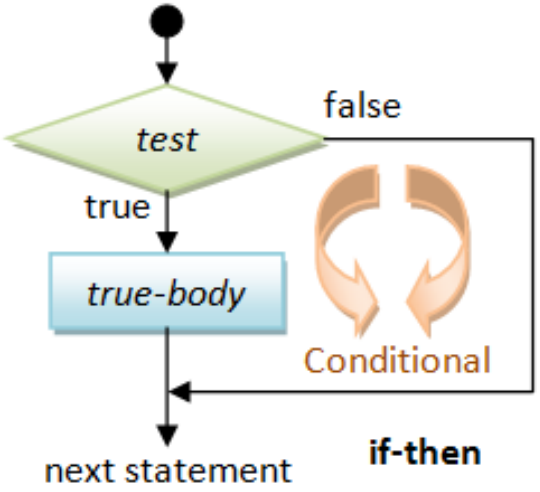
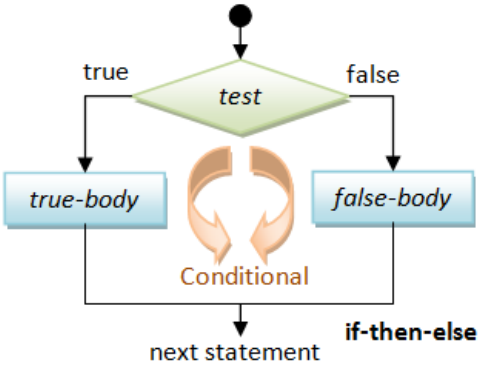
If uitdrukking

```
if ( condition ) {
        true-body ;
}
```




```
if ( condition ) {
   true-body ;
} else {
   false-body ;
}
```



De grootte van de slang

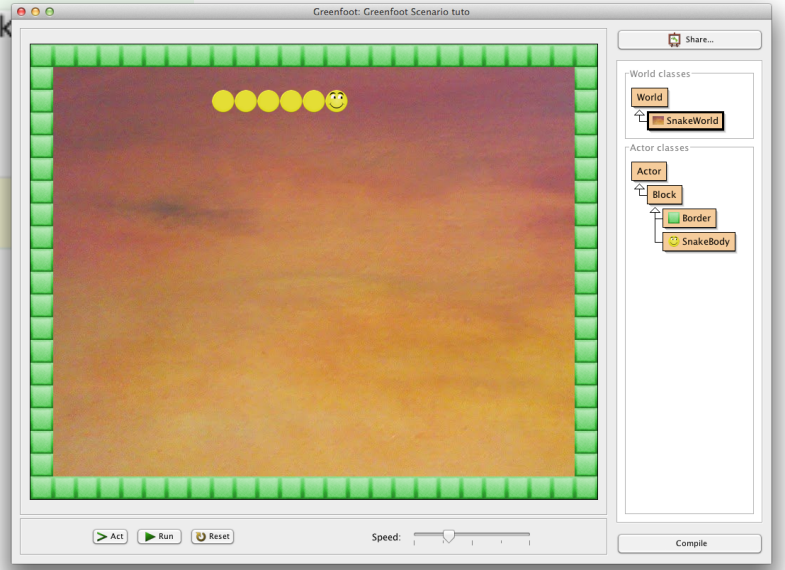
```
public class SnakeWorld extends World
{
    private LinkedList<SnakeBody> snake = new LinkedList<Snak
    private int dx = 1;
    private int dy = 0;
    private int tailCounter = 5;
```

```
    public void act()
    {
      //on remplace l'image de la tête
      SnakeBody head = snake.getLast();
      head.setImage("tail.png");

      //crée une nouvelle tête
      SnakeBody newHead = new SnakeBody();
      int newHeadX = head.getX()+dx;
      int newHeadY = head.getY()+dy;

      //ajoute la nouvelle tête à la liste et au world
      addObject(newHead, newHeadX, newHeadY);
      snake.add(newHead);

      if (tailCounter == 0) {
          SnakeBody tail = snake.removeFirst();
          removeObject(tail);
      } else {
          tailCounter--;
      }
    }
```



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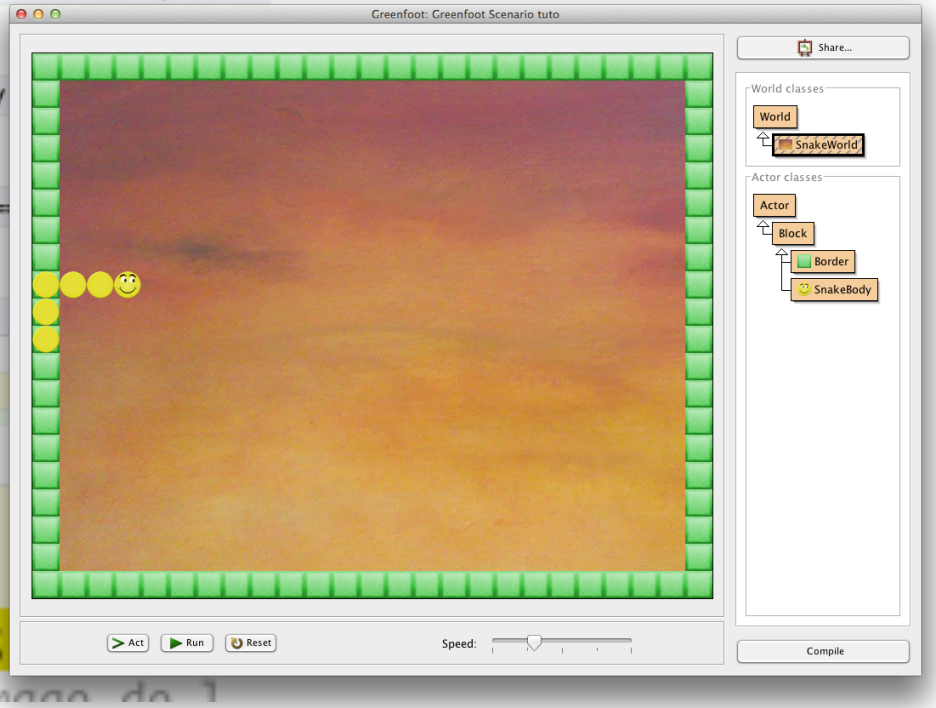
Van richting veranderen

```
private void changeDirection() {
    if (Greenfoot.isKeyDown("left") && dx == 0 ) {
        dx = -1;
        dy = 0;
    } else if (Greenfoot.isKeyDown("right") && dx == 0 ) {
        dx = 1;
        dy = 0;
    } else if (Greenfoot.isKeyDown("down") && dy
        dx = 0;
        dy = 1;
    } else if (Greenfoot.isKeyDown("up") && dy =
        dx = 0;
        dy = -1;
    }

}
```

```
public void act()
{
    changeDirection();
```



Botsingen (1)

```
public class SnakeWorld extends World
{
    private LinkedList<SnakeBody> snake = new LinkedList<SnakeBody>();
    private int dx = 1;
    private int dy = 0;
    private int tailCounter = 5;
    private boolean dead = false;
```

```
    public void act()
    {
        if (dead) {
            return;
        }
        changeDirection();
```

```
    public void dead() {
        dead = true;
    }
```

Botsingen (2)

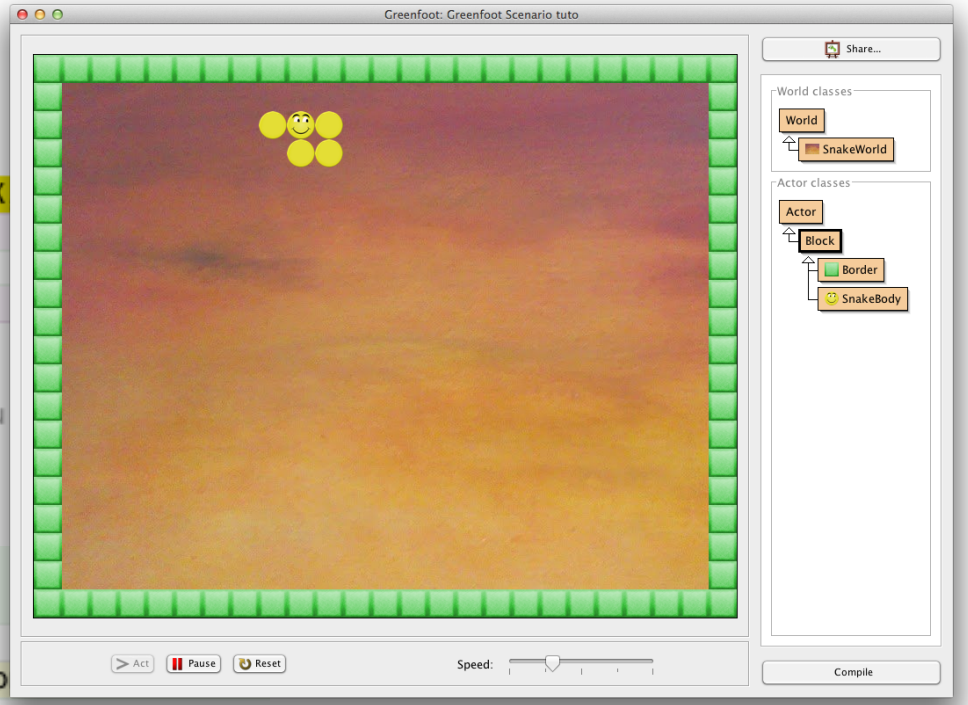
```
//crée une nouvelle tête
SnakeBody newHead = new SnakeBody();
int newHeadX = head.getX()+dx;
int newHeadY = head.getY()+dy;

List<Block> blocks = getObjectsAt(newHeadX
for(Block block : blocks) {
    block.collision(this);
}


//ajoute la nouvelle tête à la liste et au
addObject(newHead, newHeadX, newHeadY);
snake.add(newHead);
```

```
public class Block extends Actor
{

    public void collision(SnakeWo
        world.dead();
    }
}
```



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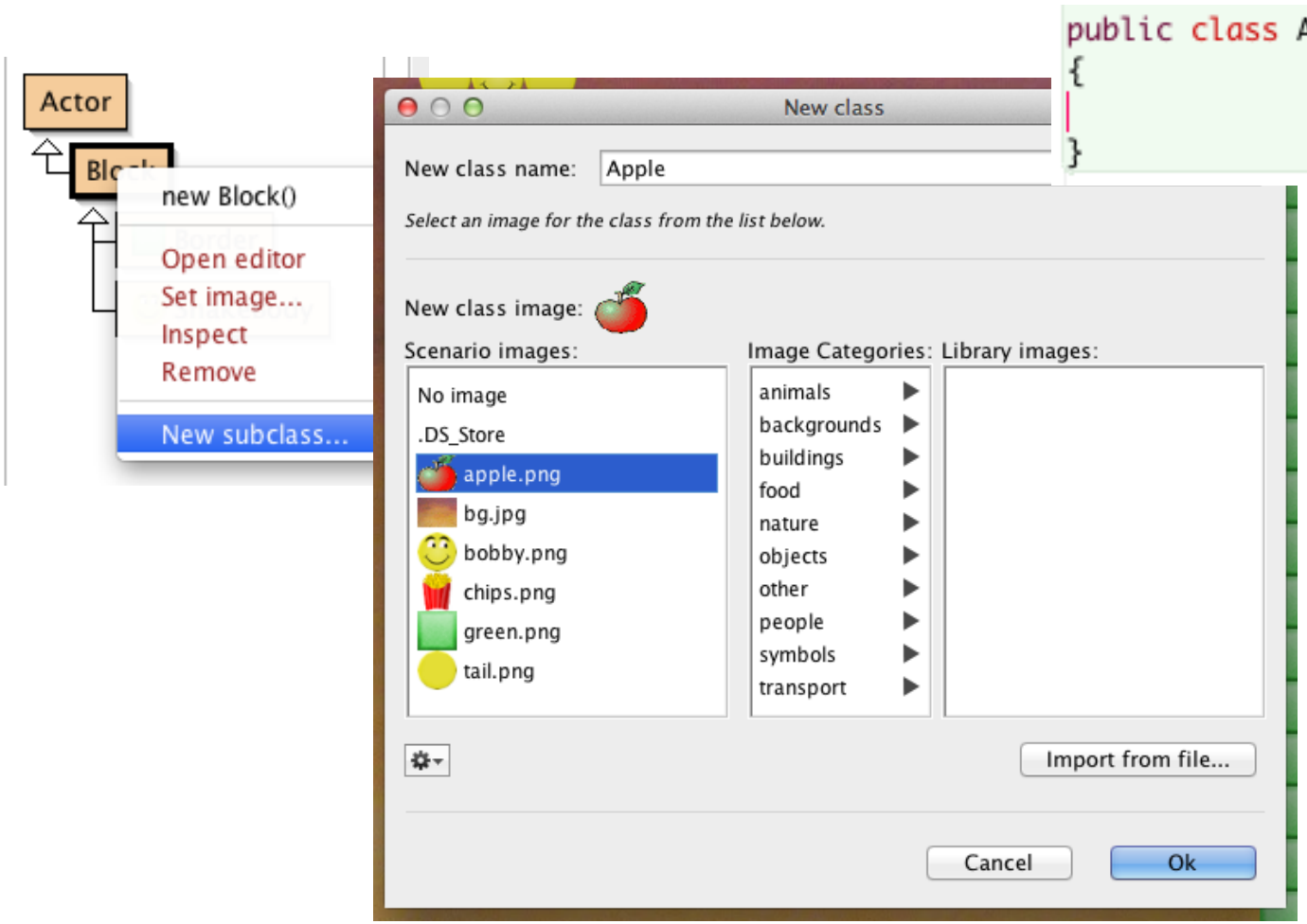
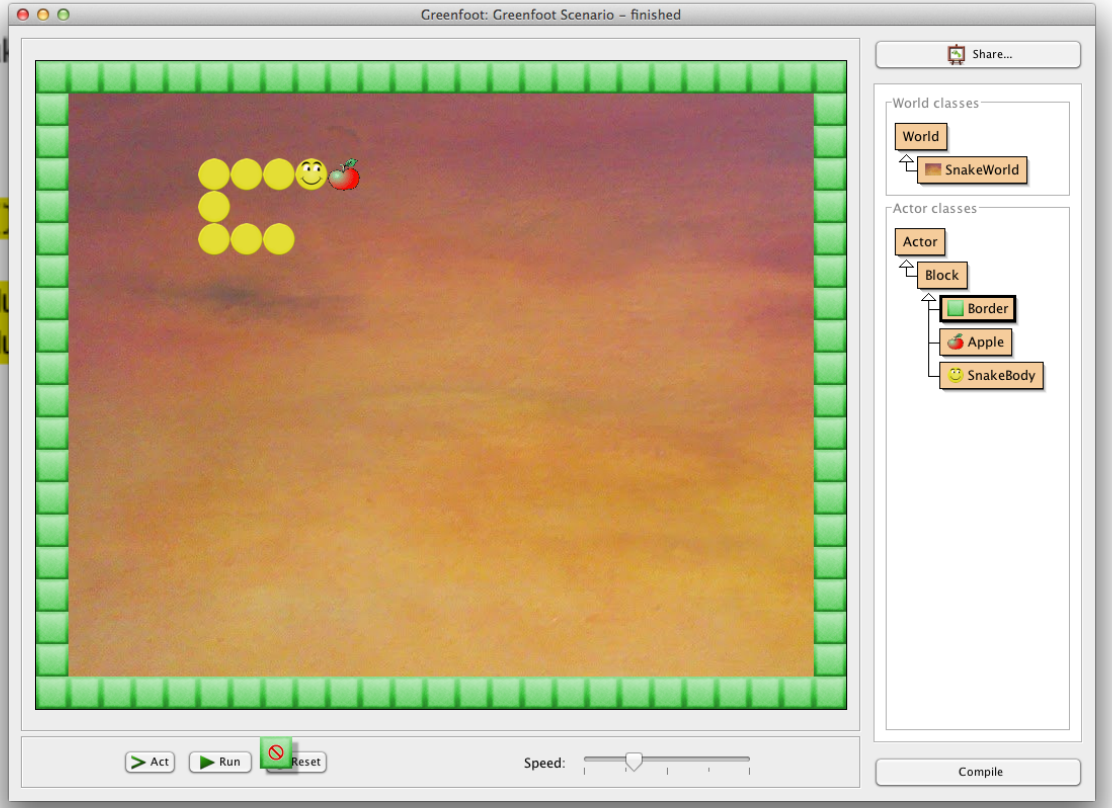
Appelen toevoegen (1)




```
public class Apple extends Block
{

}
```

Appelen toevoegen (2)

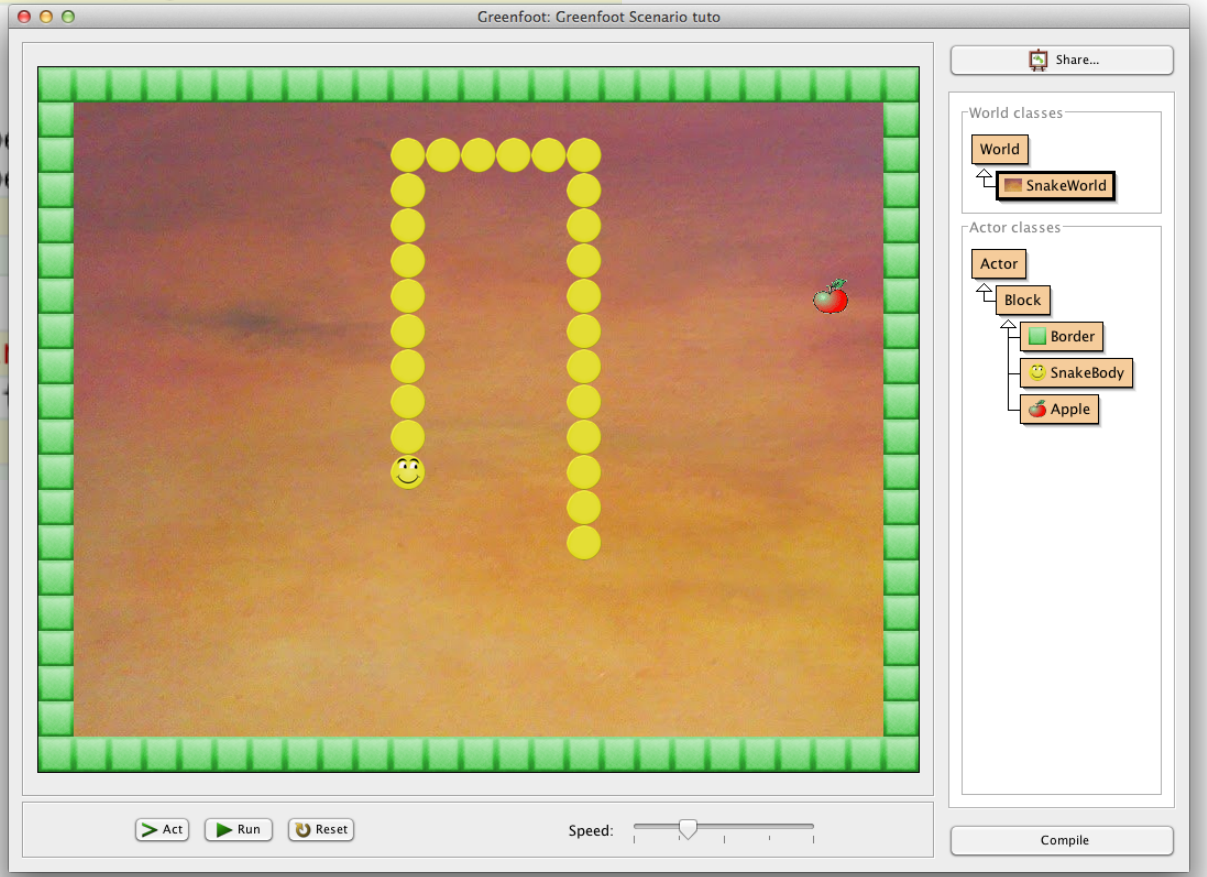
```
public SnakeWorld()
{
    super(25, 20, 32);

    SnakeBody body = new Snak
    snake.add(body);
    addObject(body, 2, 2);

    Apple apple = new Apple(
    addObject(apple,
        Greenfoot.getRandomNu
        Greenfoot.getRandomNu
```



Botsing met een appel

```
public class Apple extends Block
{
    public void collision(SnakeWorld world) {
        world.grow(2);

        setLocation(
            Greenfoot.getRandomNumbe
            Greenfoot.getRandomNumbe
    }
}
```

```
    public void grow(i
        tailCounter =
    }
```



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Geluid

```
public void collision(SnakeWorld world) {
    Greenfoot.playSound("slurp.mp3");
    world.grow(2);
    setLocation(
        Greenfoot.getRandomNumber(getWorld().getWidth()-2)+1,
        Greenfoot.getRandomNumber(getWorld().getHeight()-2)+1);
}
```

```
public void collision(SnakeWorld world) {
    Greenfoot.playSound("dead.mp3");
    world.dead();
}
```

Proficiat!

- Je hebt net je eerste Greenfoot spel gemaakt.
- Je kan nu nieuwe ideeën aan jouw spel toevoegen of een nieuw spel bouwen.