

# CompSci 94 KeyPressListener, Collision Listeners November 4, 2021



Prof. Susan Rodger

CompSci 94 Fall 2021

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## Announcements

- Assignment 5 is due Thursday, November 11
- Watch videos and online quiz for Tuesday
- Exam 2 is November 16

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Q1: How do I get the hare to turn around?

```
this addKeyPressListener add detail ▼  
  
declare procedure keyPressed [event] isLetter [event] isDigit [event] getKey  
do in order  
  [this.hare] turn RIGHT, 1.0 add detail ▼
```

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Q1: How do I get the hare to turn around?

```
this addKeyPressListener add detail ▼  
  
declare procedure keyPressed [event] isLetter [event] isDigit [event] getKey  
do in order  
  [this.hare] turn RIGHT, 1.0 add detail ▼
```

- Press any key and the hare will turn around
- Not a good way to do this. Can't use any other keys for anything else.

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Q2: What happens if I press letter A?  
If I press the letter T?

```
declare procedure keyPressed (event isLetter, event isDigit)
do in order
  if (event isLetter) is true then
    this.pig turn RIGHT, 1.0 add detail
  else
    drop statement here
  if (event isKey T) is true then
    this.panda turn RIGHT, 1.0 add detail
  else
    drop statement here
```

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Q2: What happens if I press letter A?  
If I press the letter T?

- Letter A – pig turns
- Letter T – pig turns, then panda turns

```
declare procedure keyPressed (event isLetter, event isDigit)
do in order
  if (event isLetter) is true then
    this.pig turn RIGHT, 1.0 add detail
  else
    drop statement here
  if (event isKey T) is true then
    this.panda turn RIGHT, 1.0 add detail
  else
    drop statement here
```

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Q3: What happens if press letter A?  
If press letter T?

```
declare procedure keyPressed (event isLetter, event isDigit)
do in order
  if (event isLetter) is true then
    this.pig turn RIGHT, 1.0 add detail
  else
    if (event isKey T) is true then
      this.panda turn RIGHT, 1.0 add detail
    else
      drop statement here
```

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Q3: What happens if press letter A?  
If press letter T?

- Letter A – pig turns once
- Letter T – pig turns once

```
declare procedure keyPressed (event isLetter, event isDigit)
do in order
  if (event isLetter) is true then
    this.pig turn RIGHT, 1.0 add detail
  else
    if (event isKey T) is true then
      this.panda turn RIGHT, 1.0 add detail
    else
      drop statement here
```

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## Q4: What does Combine and Fire\_Multiple do?

```
this addKeyPressListener, multipleEventPolicy COMBINE, heldKeyPolicy FIRE_MULTIPLE

declare procedure keyPressed event isLetter event isDigit event getKey
do in order
  if event isKey RIGHT is true then
    this.whiteRabbit move RIGHT, =0.25 add detail
  else
    if event isKey UP is true then
      this.whiteRabbit move FORWARD, =0.25 add detail
    else
      drop statement here
```

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## Q4: What does Combine and Fire\_Multiple do?

- Hold the key down and the whiteRabbit moves a lot faster until you release the key!

```
this addKeyPressListener, multipleEventPolicy COMBINE, heldKeyPolicy FIRE_MULTIPLE

declare procedure keyPressed event isLetter event isDigit event getKey
do in order
  if event isKey RIGHT is true then
    this.whiteRabbit move RIGHT, =0.25 add detail
  else
    if event isKey UP is true then
      this.whiteRabbit move FORWARD, =0.25 add detail
    else
      drop statement here
```

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## Q5: What happens when ...

```
this addCollisionStartListener this.bunnies, new SThing[] { this.whiteRabbit, this.panda }

declare procedure collisionStarted event getSThingFromSetA event getSThingFromSetB
do in order
  this.whiteRabbit turn RIGHT, =1.0 add detail
```

- a) panda collides with a bunny?
- b) whiteRabbit collides with a bunny?

Note: bunnies is an array of bunnies

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## Q5: What happens when ...

```
this addCollisionStartListener this.bunnies, new SThing[] { this.whiteRabbit, this.panda }

declare procedure collisionStarted event getSThingFromSetA event getSThingFromSetB
do in order
  this.whiteRabbit turn RIGHT, =1.0 add detail
```

- a) panda collides with a bunny?  
WhiteRabbit (W.R.) turns right
- b) whiteRabbit collides with a bunny?  
whiteRabbit turns right

Note: bunnies is an array of bunnies

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Q6: What happens when

- a) panda collides with a bunny?
- b) whiteRabbit collides with a bunny?
- c) pig collides with a bunny?
- d) whiteRabbit collides with panda?



```
declare procedure collisionStarted
do in order
  if (getSThingFromSetB == this.whiteRabbit) is true then
    this.whiteRabbit say "hello" add detail
  else
    if (getSThingFromSetB == this.panda) is true then
      this.panda say "hello" add detail
    else
      this.pig say "hello" add detail
```

Q6: What happens when

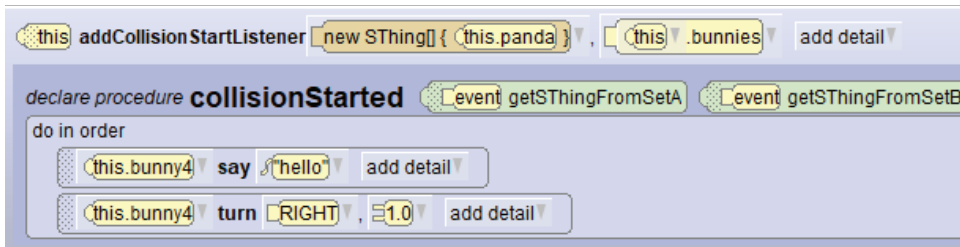
- a) panda collides with a bunny? *Panda says hello*
- b) whiteRabbit collides with a bunny? *W.R. says hello*
- c) pig collides with a bunny? *Nothing happens*
- d) whiteRabbit collides with panda? *Nothing happens*



```
declare procedure collisionStarted
do in order
  if (getSThingFromSetB == this.whiteRabbit) is true then
    this.whiteRabbit say "hello" add detail
  else
    if (getSThingFromSetB == this.panda) is true then
      this.panda say "hello" add detail
    else
      this.pig say "hello" add detail
```

## Q7: Clicking on an array object

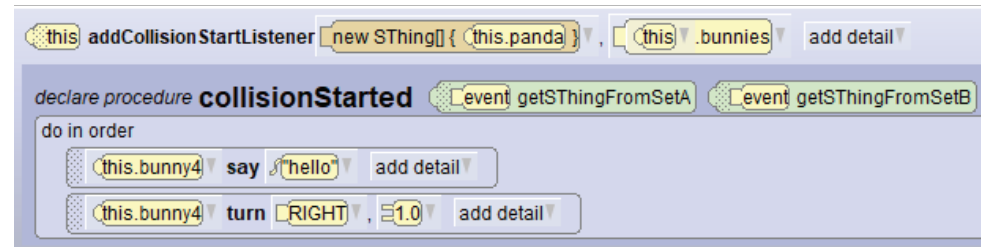
- There is an array of bunnies. When a bunny collides with panda, you want the bunny that collided with the panda to say hello and turn around once.
- Why doesn't this code work?



```
declare procedure collisionStarted
do in order
  this.bunny4 say "hello" add detail
  this.bunny4 turn RIGHT, 1.0 add detail
```

## Q7: Clicking on an array object

- There is an array of bunnies. When a bunny collides with panda, you want the bunny that collided with the panda to say hello and turn around once.
- Why doesn't this code work? *Bunny4 says and turns*



```
declare procedure collisionStarted
do in order
  this.bunny4 say "hello" add detail
  this.bunny4 turn RIGHT, 1.0 add detail
```

## Q7: Clicking on an array object

- There is an array of bunnies. When a bunny collides with panda, you want the bunny that collided with the panda to say hello and turn around once.
- Can you change the code to this?

```
addCollisionStartListener new SThing [ (this.panda) ], [ (this).bunnies ] add detail  
  
declare procedure collisionStarted [Event] getSThingFromSetA [Event] getSThingFromSetB  
do in order  
  this.bunny4 say hello add detail  
  this.bunny4 turn RIGHT 1.0 add detail
```

## Q7: Clicking on an array object

- There is an array of bunnies. When a bunny collides with panda, you want the bunny that collided with the panda to say hello and turn around once.
- Can you change the code to this? **NO!**

```
addCollisionStartListener new SThing [ (this.panda) ], [ (this).bunnies ] add detail  
  
declare procedure collisionStarted [Event] getSThingFromSetA [Event] getSThingFromSetB  
do in order  
  this.bunny4 say hello add detail  
  this.bunny4 turn RIGHT 1.0 add detail
```

## Why not?

- This code: `[Event] getSThingFromSetB`
  - Is an Sthing so you CANNOT drop it over a type bunny
- Instead, you have to look through the bunny array and compare each bunny with with an Sthing. When you find the bunny that was clicked on, then you just refer to that bunny

## Find bunny clicked on in array

- Write a loop to iterate through the bunny array, for each bunny in the array, check to see if it is the item clicked on.

```
addCollisionStartListener new SThing [ (this.panda) ], [ (this).bunnies ] add detail  
  
declare procedure collisionStarted [Event] getSThingFromSetA [Event] getSThingFromSetB  
do in order  
  for each Bunny someBunny in [ (this).bunnies ]  
    if [Event] getSThingFromSetB == someBunny is true then  
      this.bunny4 say hello add detail  
      this.bunny4 turn RIGHT 1.0 add detail  
    else  
      drop statement here  
  loop
```

## Find bunny clicked on in array

- Write a loop to iterate through the bunny array, for each bunny in the array, check to see if it is the item clicked on.

The image shows a Scratch code editor with a procedure named `collisionStarted`. It starts with a `do in order` block containing a `for each` loop over `(this).bunnies`. Inside the loop, there is an `if` block: `if (Event) getSThingFromSetB == (someBunny) is true then`. The `if` block contains two actions: `(this.bunny4) say "hello" add detail` and `(this.bunny4) turn RIGHT, 1.0 add detail`. An `else` block contains `drop statement here`. A green box highlights the `if` block, and the word **COMPARE** is written in green to the right.

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## Find bunny clicked on in array

- Write a loop to iterate through the bunny array, for each bunny in the array, check to see if it is the item clicked on.

The image shows the same Scratch code editor as slide 21. A black arrow points from the `(someBunny)` variable in the `if` block to a green box containing the text **Have someBunny do things if it matches**.

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## Find bunny clicked on in array

- Write a loop to iterate through the bunny array, for each bunny in the array, check to see if it is the item clicked on.

The image shows the final Scratch code editor. The `if` block now uses `(someBunny)` instead of `(this.bunny4)` for both the `say` and `turn` actions. The word **FINAL CODE** is written in green to the right.

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## Class Today

- A game with collisions

