

CompSci 94

Arrays, Loops with Arrays

October 19, 2021



Prof. Susan Rodger

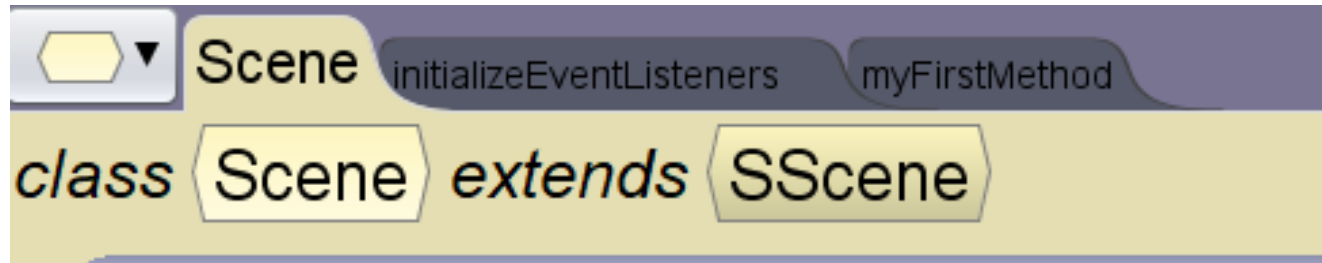
Announcements

- QZ and Videos for next time
- Assignment 4 out today, due Oct 28

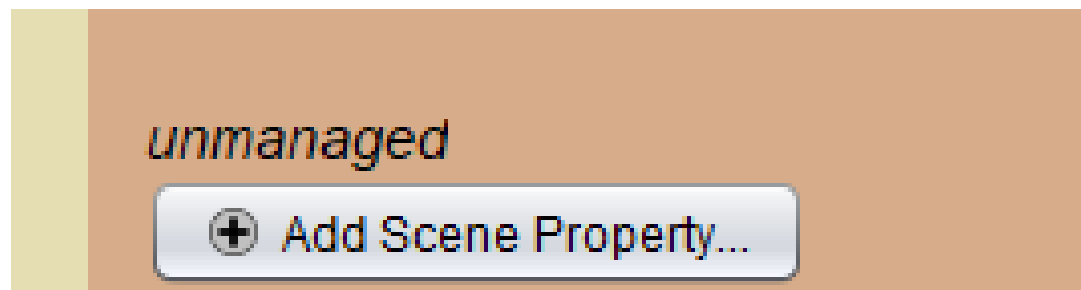
How and Where does one create an array?

How and Where does one create an array?

- Create as a Scene Property



- Go to bottom of page and add there.



Example – Build array of Flyers

- Be sure to check box by “is array”
- Must add Objects into the array

Add Scene Property

preview: `Flyer[]` **lotsOfBirds** ← `new Flyer[] { this.phoenix, this.chicken, this.flamingo, this.penguin, this.ostrich }`

is variable: variable field
 constant field

value type: `Flyer` is array

name: `lotsOfBirds`

initializer: `new Flyer[] { this.phoenix, this.chicken, this.flamingo, this.penguin, this.ostrich }`

Result

```
unmanaged  
▼ Flyer[] lotsOfBirds ← new Flyer[] { this.phoenix, this.chicken, this.flamingo, this.penguin, this.ostrich }
```



Q1. Arrays

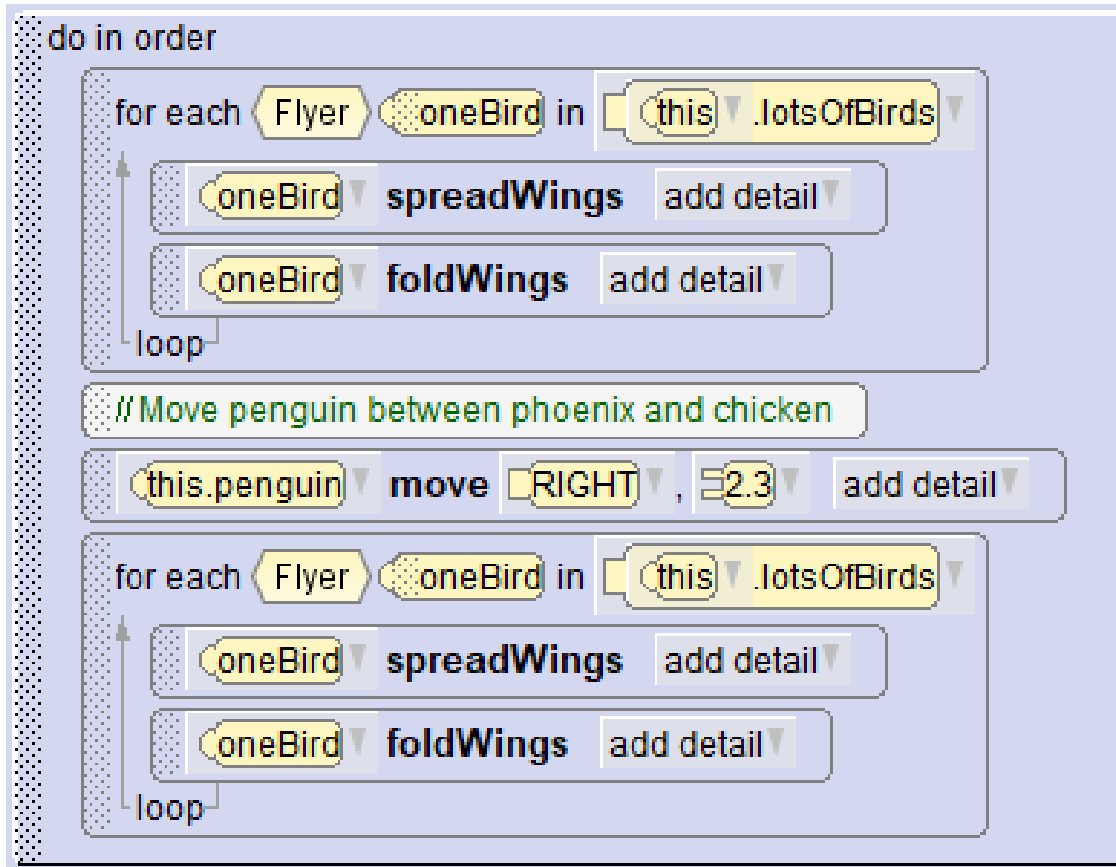
- What is an array?
- Why create an array?
- Can an object be in more than one array?

Q1. Arrays

- What is an array?
 - A group of similar objects
 - Examples: All flyers, all decimalNumbers, all SJointedModel
- Why create an array?
 - Can have just one instruction for every item in the array
 - Less code
- Can an object be in more than one array?
 - Yes!

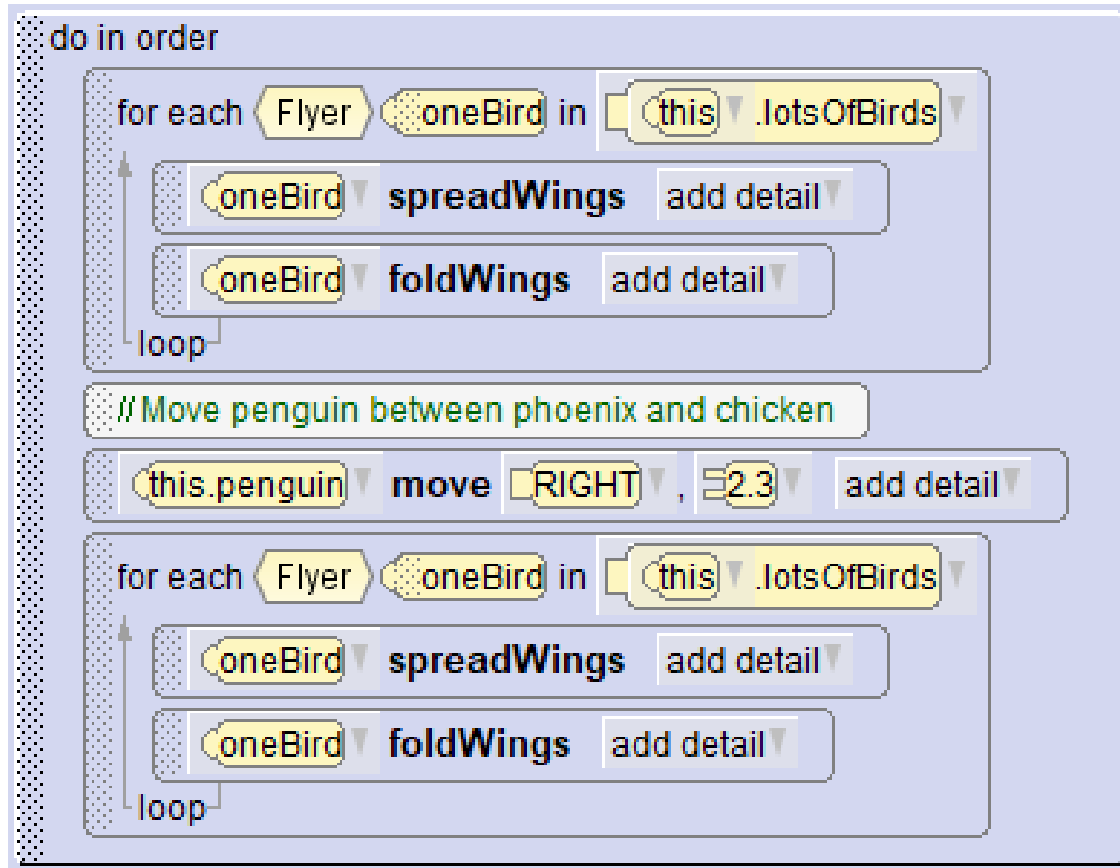
Q2. What is the order the birds do something here?

lotsOfBirds ← new Flyer[] { this.phoenix, this.chicken, this.flamingo, this.penguin, this.ostrich }



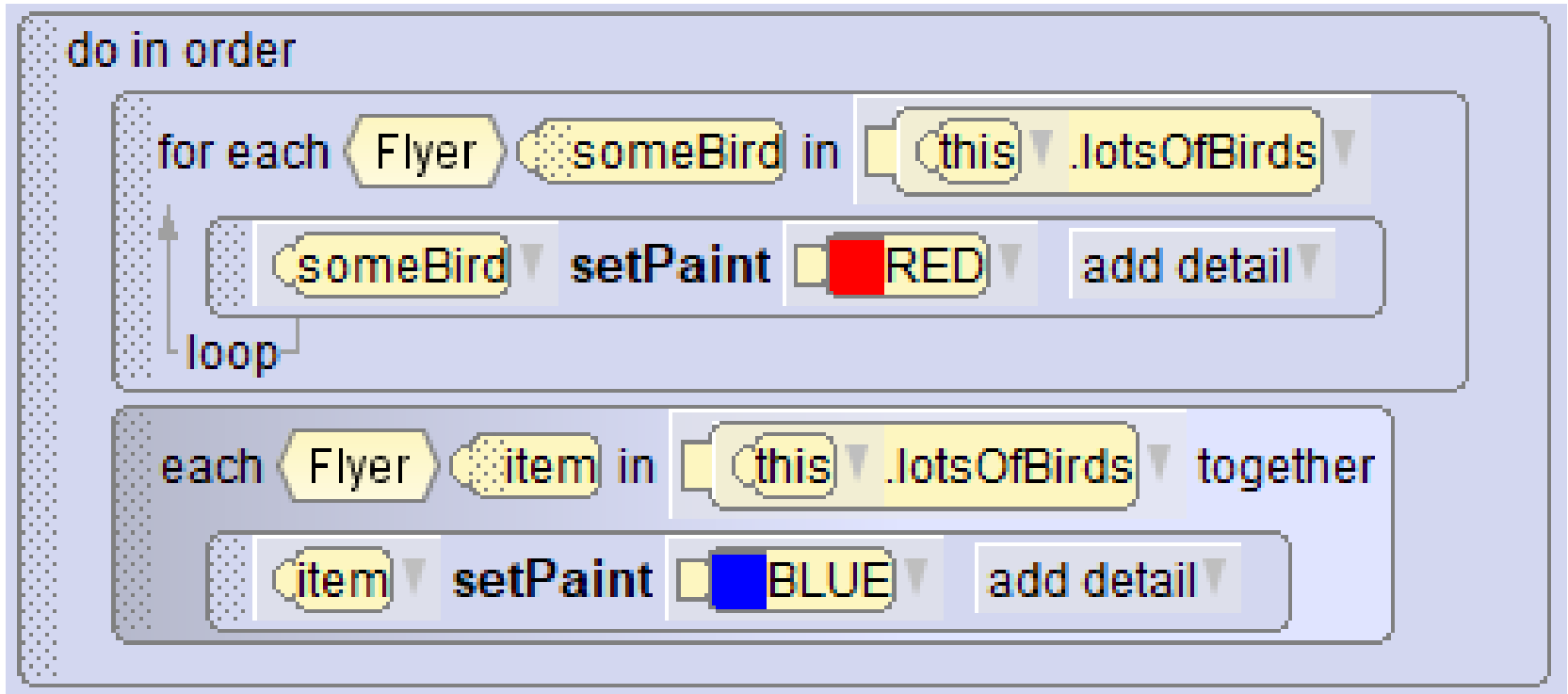
Q2. What is the order the birds do something here?

lotsOfBirds ← new Flyer[] { this.phoenix, this.chicken, this.flamingo, this.penguin, this.ostrich }

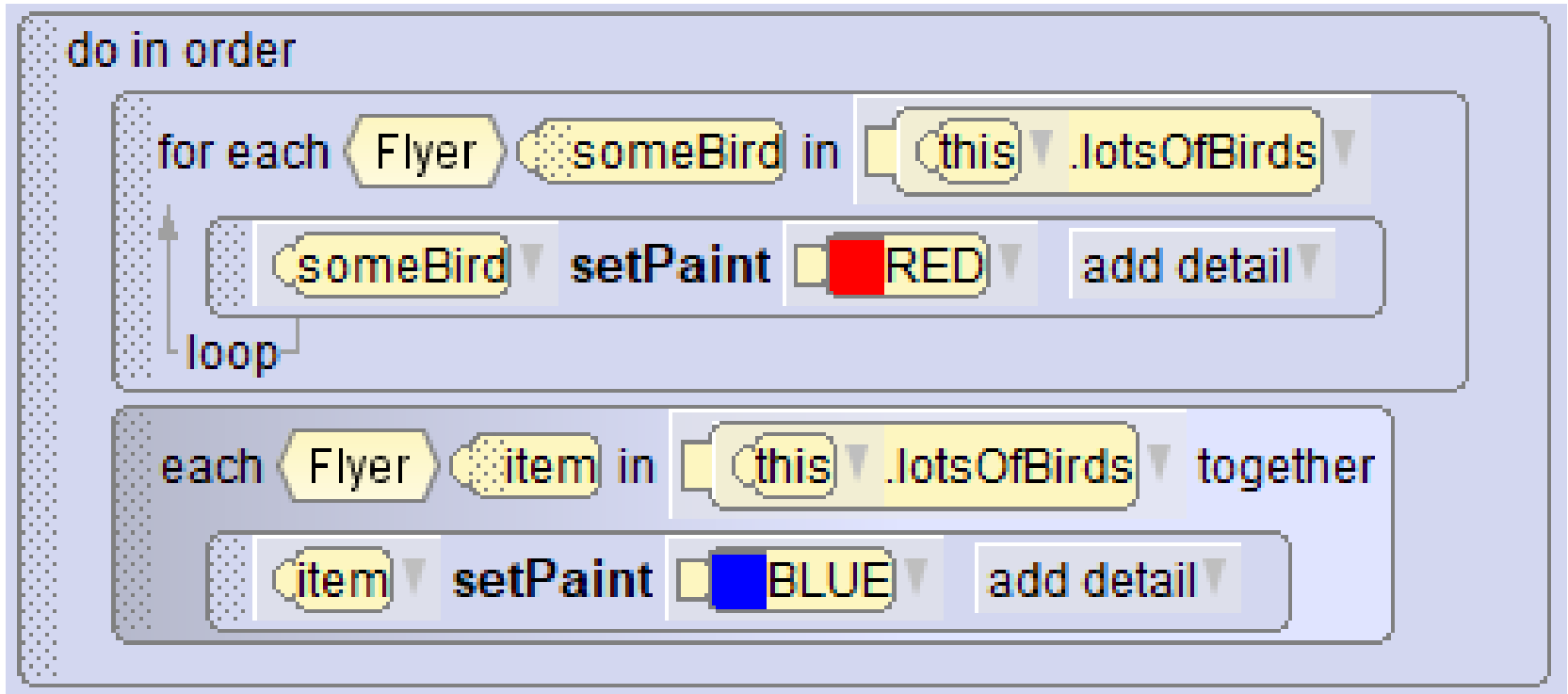


- Move their wings in this order: Phoenix, chicken, flamingo, penguin, ostrich, then SAME order again

Q3. What does this code do?



Q3. What does this code do?



- The birds in array `lotsOfBirds` turn red one at a time. Then at the same time they all turn blue.

Q4. What does this code do?

```
TextString[] greetings ← new TextString[] { "How are you today?", "Welcome", "Nice to see you." }
```

do in order

```
for each TextString saying in this.greetings
```

```
  this.phoenix say saying add detail
```

loop

```
each TextString phrase in this.greetings together
```

```
  this.penguin say phrase add detail
```

Q4. What does this code do?

```
TextString[] greetings ← new TextString[] { "How are you today?", "Welcome", "Nice to see you." }
```

do in order

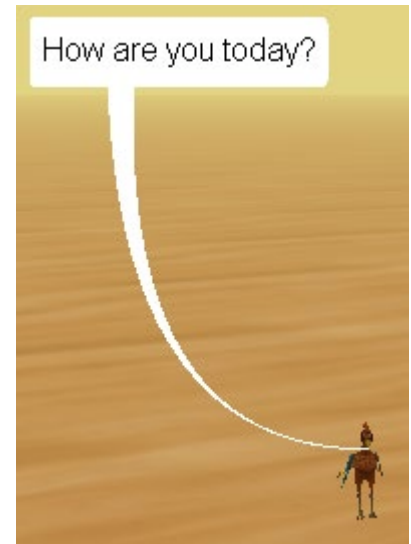
for each TextString saying in this.greetings

this.phoenix say saying add detail

loop

each TextString phrase in this.greetings together

this.penguin say phrase add detail

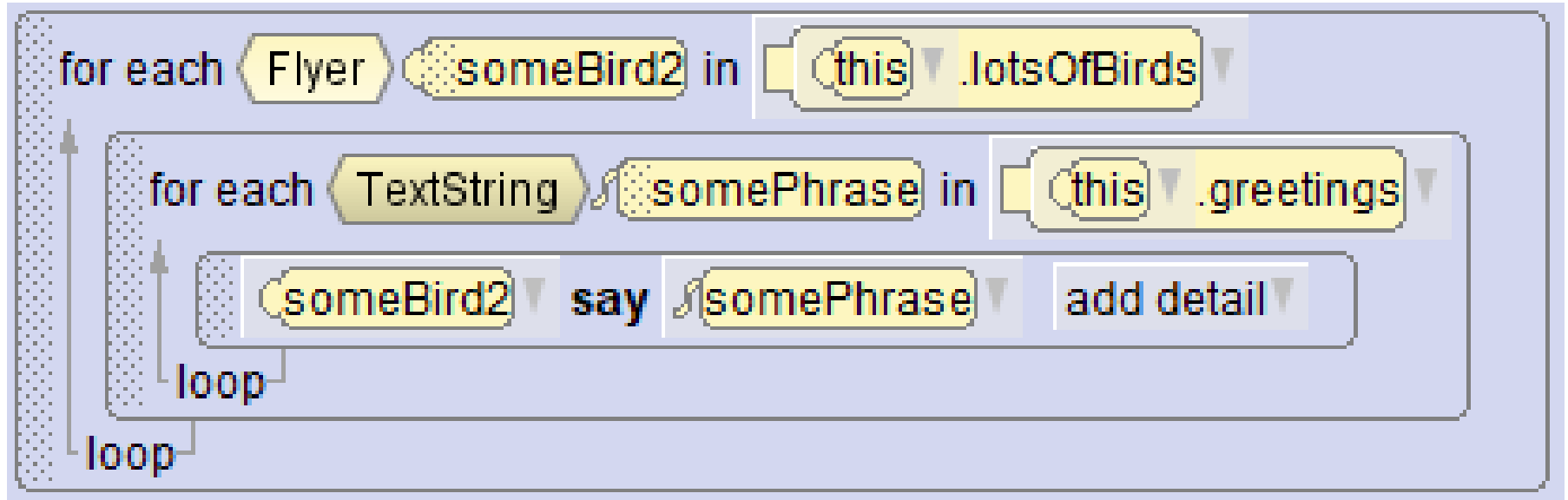


How are you today?

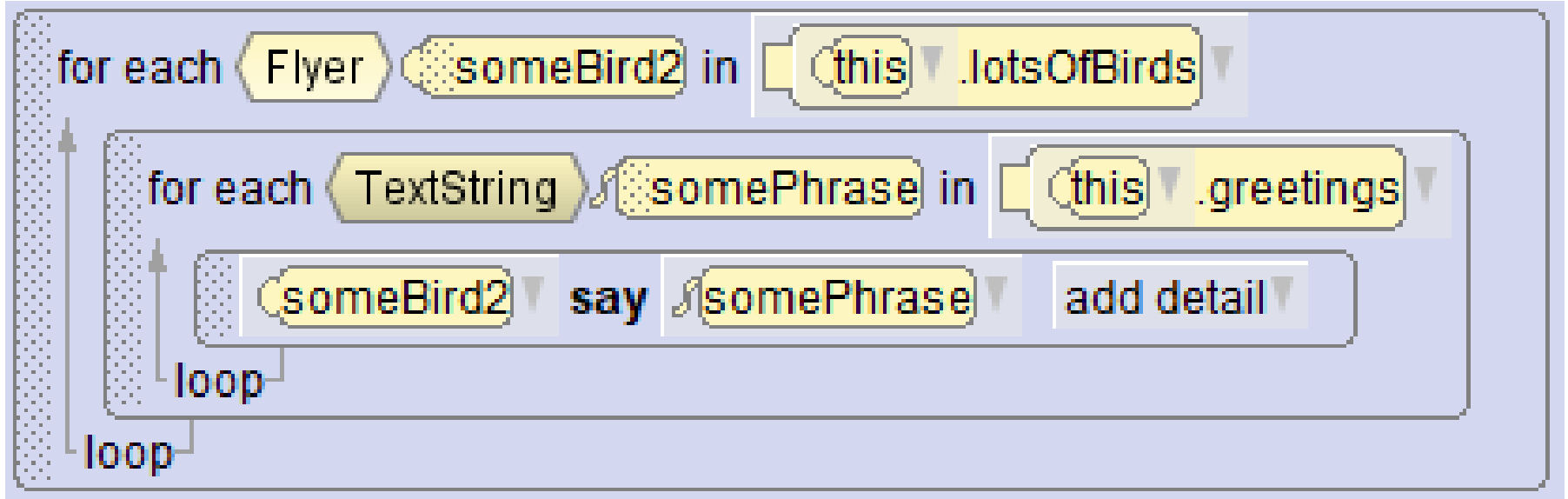
Nice to see you.

- Phoenix says greetings one at a time
- Then Penguin says the greetings all at once

Q5. What does this code do?

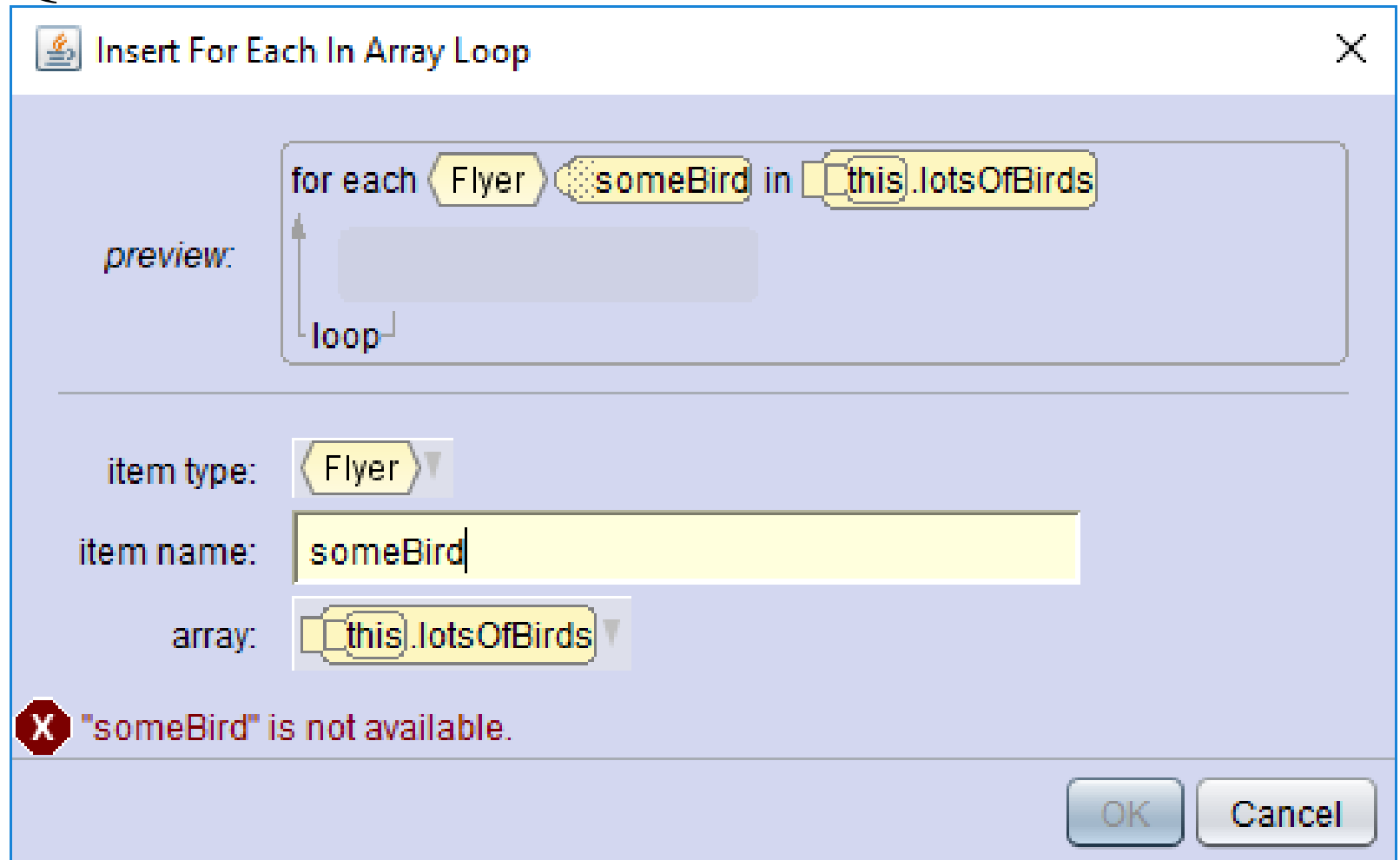


Q5. What does this code do?



- Each bird in the array `lotsOfBirds`, one at a time, says the phrases in the array `greetings`, one at a time.

Q6. What does this error mean?



The screenshot shows a dialog box titled "Insert For Each In Array Loop" with a close button (X) in the top right corner. The dialog is divided into several sections:

- preview:** A preview window showing the code: `for each Flyer someBird in this.lotsOfBirds`. Below the code is a greyed-out area representing the loop body. An arrow labeled "loop" points to the body area.
- item type:** A dropdown menu set to "Flyer".
- item name:** A text input field containing "someBird".
- array:** A dropdown menu set to "this.lotsOfBirds".

At the bottom left, there is a red error icon (X) with the message: **"someBird" is not available.** A black arrow points from the left edge of the slide towards this error message.

At the bottom right, there are two buttons: "OK" and "Cancel".

Q6. What does this error mean?

The screenshot shows a dialog box titled "Insert For Each In Array Loop" with a close button (X) in the top right corner. The dialog contains a preview of a code snippet: `for each Flyer someBird in this.lotsOfBirds`. Below the preview, there are three fields: "item type" set to "Flyer", "item name" set to "someBird", and "array" set to "this.lotsOfBirds". At the bottom left, a red error icon (X) is followed by the text: "someBird" is not available. An arrow points from the left side of the slide to this error message. At the bottom right, there are "OK" and "Cancel" buttons.

- This name already exists. You must use a different name for each loop!

BE CAREFUL!

- When naming loop variable
 - Don't use the name of anything else in your program.
 - Don't use penguin, etc.
 - Use someBird, someBird2, someBird3
- Don't CUT and PASTE ARRAY LOOP code
 - This can lead to using a variable from the wrong loop. Your Alice code will freeze!

Class Today

- Iterating through Arrays

