Methods in Alice

Brookwood High School

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Methods

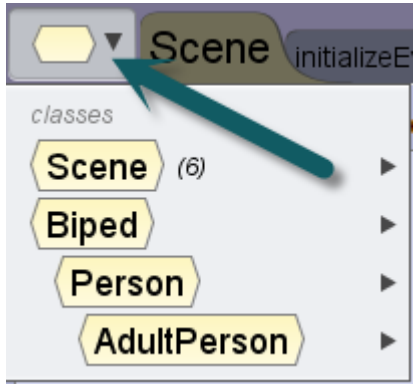
- Alice breaks methods up into 2 categories
- 1 – Procedures:
  - Procedures are methods that have object do something. They are **commands.**
- 2 – Functions:
  - Functions are methods that return information about the object. They ask **questions.**

Adding an Ice Skater

Abstraction

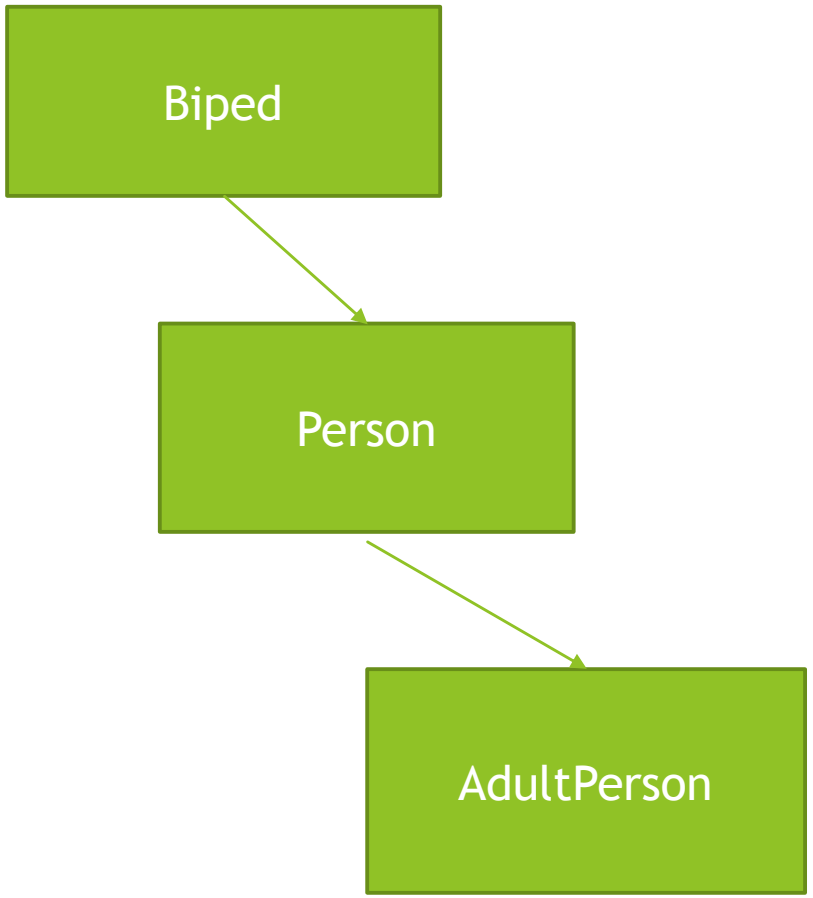
- We will add an ice skater to the environment and will write procedures to make it skate. With procedures, we can invoke (call) them over and over again without having to worry about the details involved in the process. By creating a procedure to take care of the details, we are making our programs more abstract. **Abstraction allows us not to worry about the details of how something works.**

Class Hierarchy



- By clicking the arrow next to the hexagonal shape in the top of the code editor, we will see the Hierarchy of classes.
- In the Hierarchy, we see Biped, and then slightly under to the right, Person, and then under to the right of that, AdultPerson.
- What does this mean?
  - An AdultPerson is also a Person
  - A Person is also a Biped
- This is the basis of **Inheritance**.
- Inheritance is when we have a subclass that shares the properties of a superclass.

Inheritance

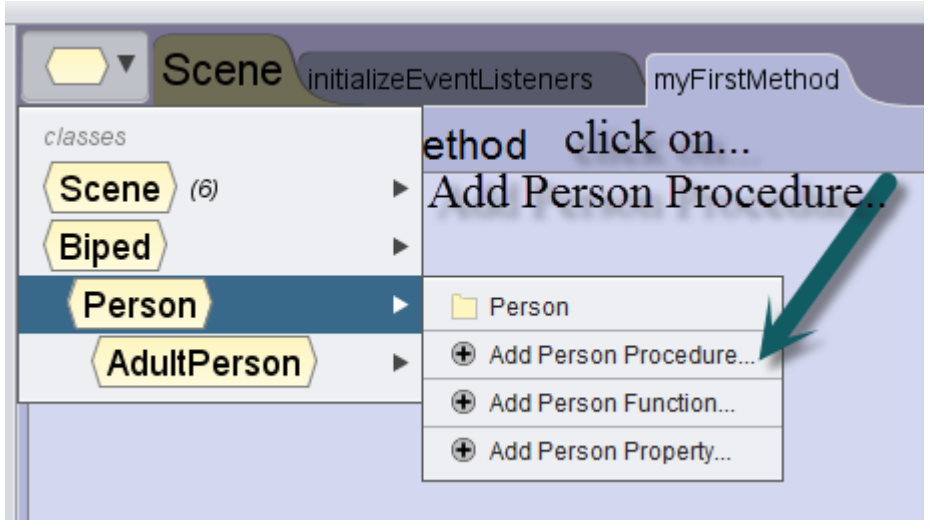


- This Hierarchy shows the relationship between these classes.
- An AdultPerson is a subclass of a Person
  - The AdultPerson takes on all of the properties of a Person and then adds to these properties. What separates an AdultPerson from a childPerson, or a teenPerson?
- A Person is a subclass of a Biped
  - There are a lot of Biped's that are not Persons. But to be a Person you walk on 2 legs so you are a Biped also.
  - The property of walking on 2 feet is shared amongst all Biped. This means that subparts for Bipeds do not need to be recreated over and over for each Biped class.
- Biped is a superclass of Person
- Person is a superclass of AdultPerson

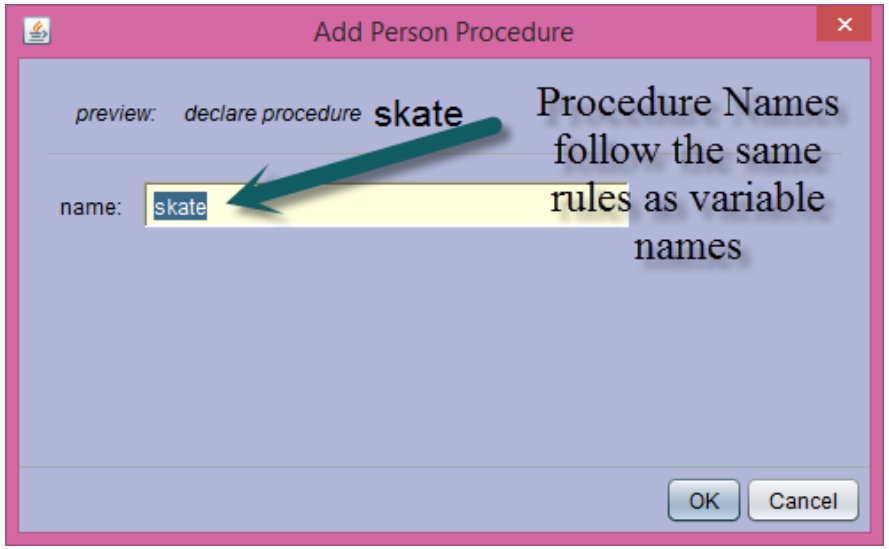
Skating Procedure

- We want to teach our iceSkater object to skate by creating a new procedure for him.
- Should we create the skate procedure for all AdultPerson objects, or is this a skill we may want to add to all Person objects?
- What about all Bipeds?
- Let's add our skating procedures at the Person level, so that all Person objects and their subclasses will know how to skate.

Click on Add Person Procedure…



Naming Methods



- When naming methods, follow the same rules as naming identifiers / objects.
  1. Start with a lowercase letter
  2. Only use letters, numbers and underscores
  3. Do not use keywords.

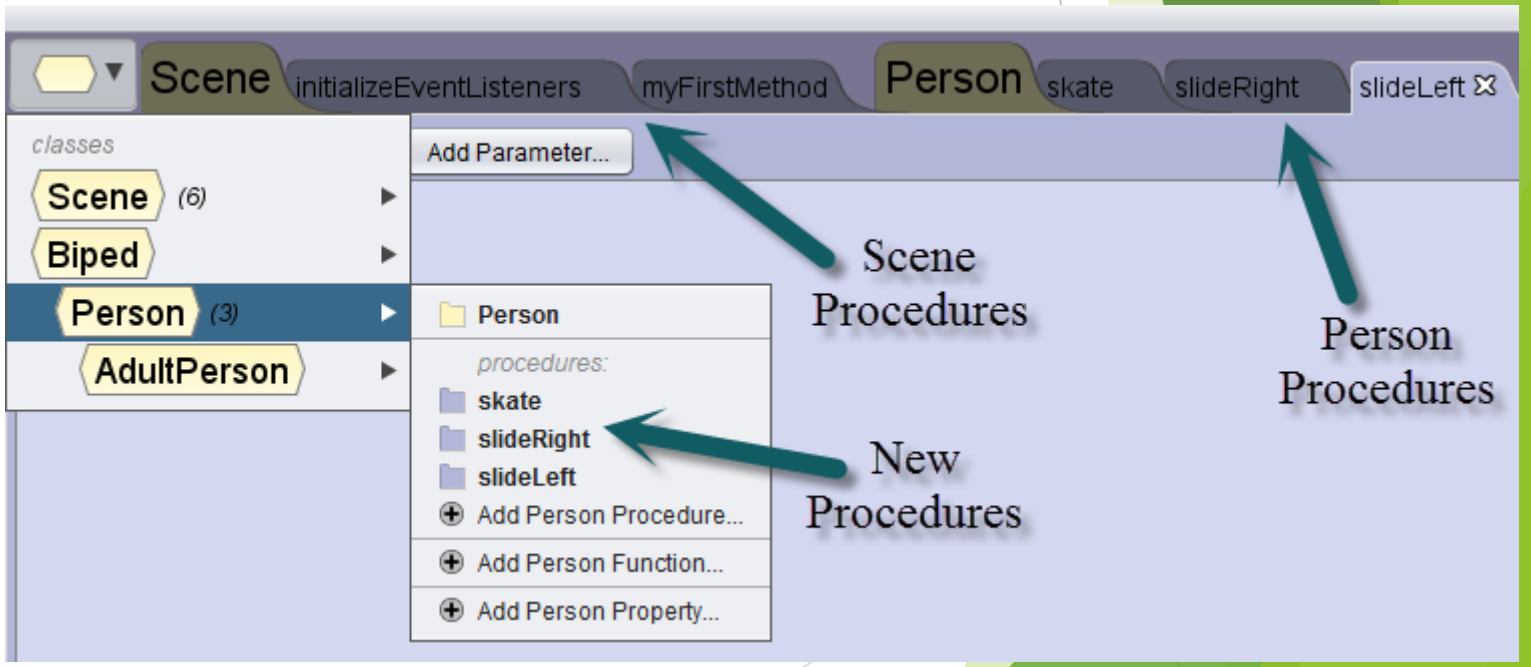
Skate Procedure Textual Storyboard

- Do the following steps together
  - Move forward 2 meters at a duration of 4 seconds
  - Do the following steps in order
    - Slide on the right leg
    - Slide on the left leg

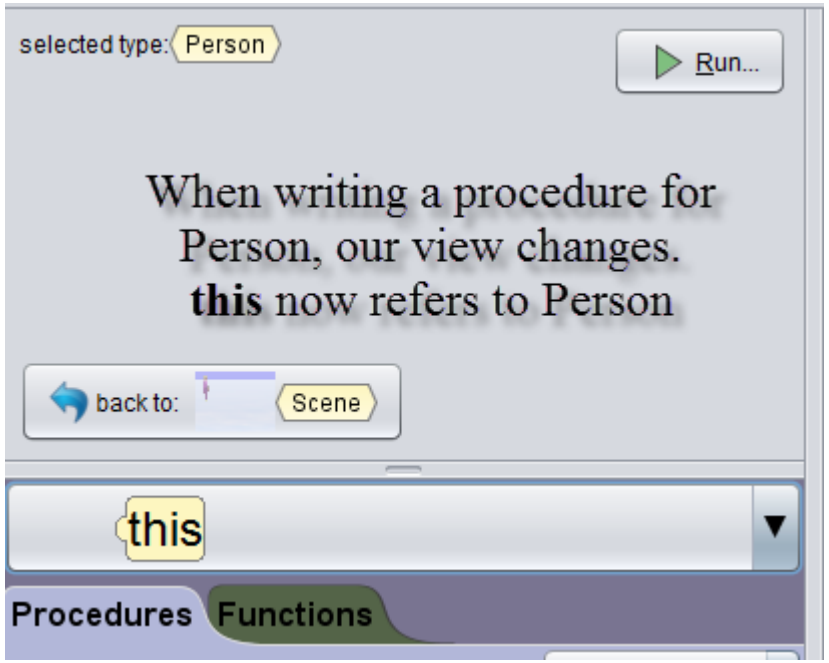
- Sliding on the right leg and sliding on the left leg, are examples of **abstraction**. We do not need to know the details of what it means to slide on the right leg entails, to understand that this will work to make an object skate forward. However, in order to write the skate procedure we will need to first right the slideRight and slideLeft procedures.

slideLeft Procedure Textual Storyboard

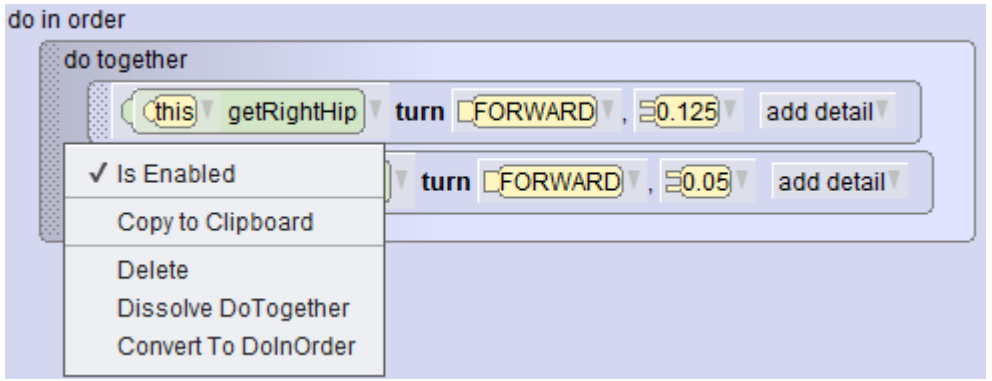
- Do the following steps together
  - Turn right leg to the back
  - Tilt upper body forward
- Do the following steps together
  - Turn right leg back to the starting position
  - Tilt the upper body back up right.
- Add 2 more procedures for Person
  - A slideRight procedure
  - A slideLeft procedure



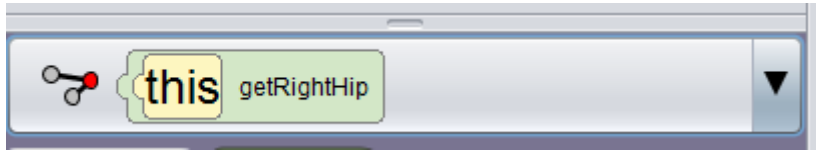
Writing slideLeft Procedure



- Add a do Together block
- Inside the doTogether block add a line that has the RightHip turn Forward 0.125
- Select the base of the spine and add the method to turn it forward 0.05
- Right click on the do together block and select Copy to Clipboard



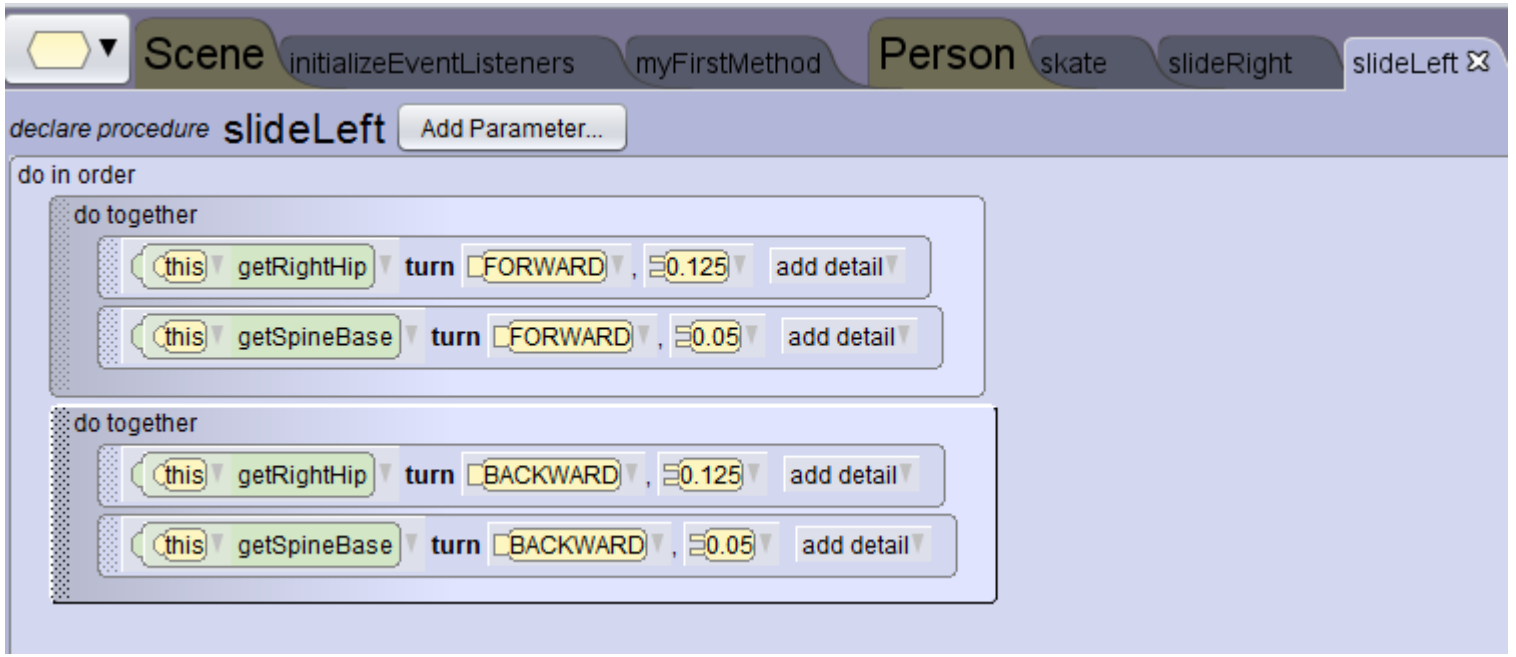
- Select the right hip. If we are sliding on our left leg, we need to lift our right leg.



- From the clipboard in the right corner, drag the copy back in, and change both Forward commands to Backward commands.

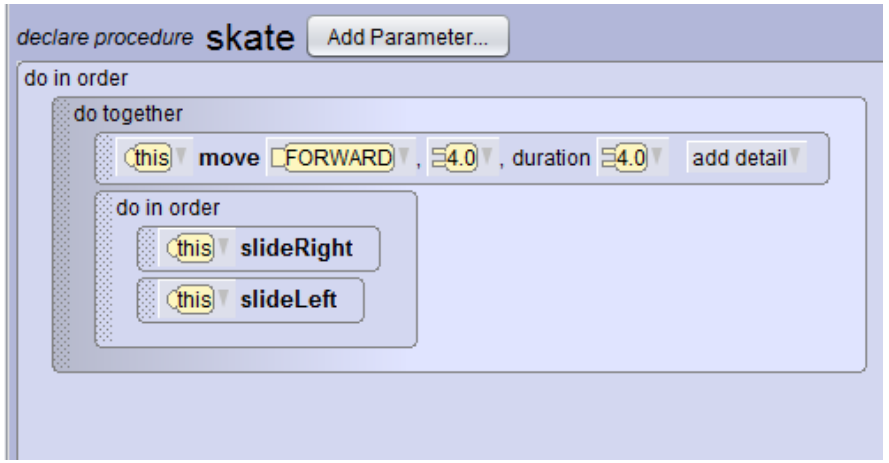
slideLeft procedure

- The procedure should look as follows:
- Duplicate this method for the slideRight procedure.
  - Change the getRightHip to getLeftHip



Finish Up The skate Procedure

- Follow the textual storyboard for skate.
- Add a call to the skate method in the myFirstMethod



Finished Product