CompSci 94
Classwork: Undetermined repetition with while loop
October 10, 2024

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1) Setting up the scene

- Use the **seafloor** for the ground
- Drag in these objects so they are in positions similar to the picture on the next page
  - Swimmer (Fish): blueTang, clownFish, shark, pajamaFish
  - Swimmer (MarineMammal): dolphin, walrusBaby
- See next slide on where to place them

Placement of objects

- Spread the objects out like so. From left to right they are blueTang, walrusBaby, shark, dolphin, pajamaFish and clownFish

- Be sure blueTang and clownFish are facing offscreen and they will flee the shark

- **Be sure to move the fish UP**, not on the ground.
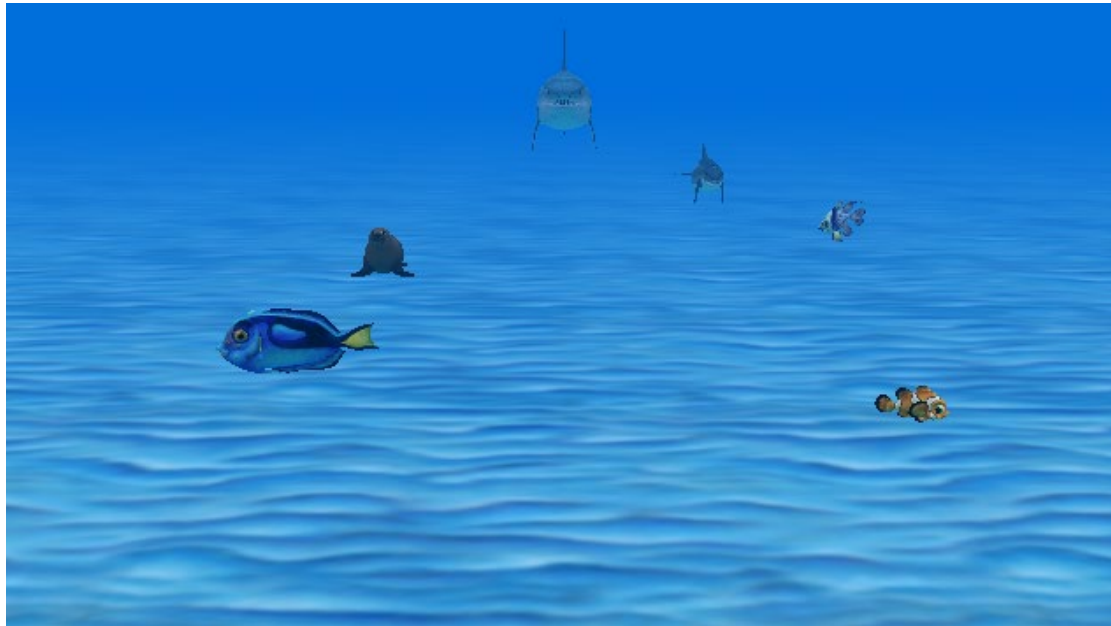
2) Make the Dolphin and walrusBaby invisible

3) Overview of Story

- The shark heads over to the pajamaFish and eats it. Then the shark chases the blueTang and eats it. Then the shark chases the clownFish and eats it. Then the shark disappears and the blueTang reappears. The camera focuses on the blueTang, which slowly turns into a walrusBaby and then the walrusBaby slowly turns into a dolphin.

- **Follow the steps that follow** to build the story, including building specific procedures.

4) Write a **Shark Procedure** called **catchfish**
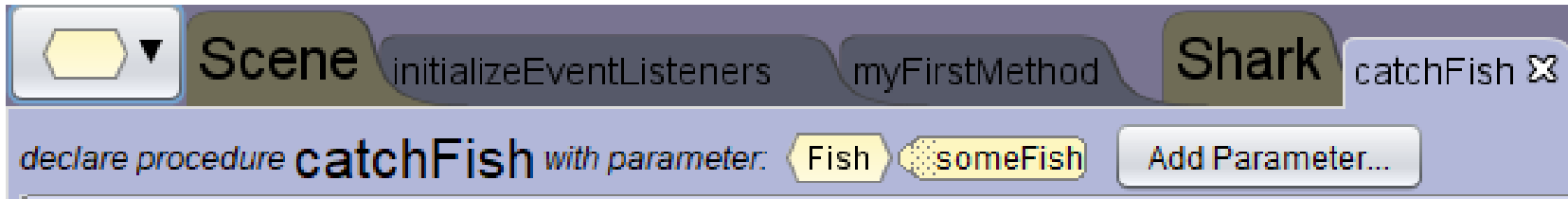
- There should be one parameter of type **Fish** named **someFish.** This fish will never move!

- The shark should **point at someFish's head** (instantly in 0.0 secs)

- Then use a while loop to have the shark repeatedly move towards the fish (0.25 distance, fast 0.01)

- Because the shark is so large, compare the distance between the shark's mouth and the fish's mouth. The shark's mouth is also big, so the shark is close enough if their mouths are 1.25 or closer in distance.

- When the shark stops, it should open its mouth (turn it), and eat the fish (disappear), and close the mouth

5) Story Part 1 - Add code in myFirstMethod

- Add a do in order into myFirstMethod.

- Add code in myFirstMethod for the shark to catch the pajamaFish. Note the pajamaFish never moves. It must be asleep!

6) Write a **Fish procedure** named **moveRandom** to randomly move a fish **ONCE**

- **No parameters** in this procedure

- **No loop** in this code, just move the fish once

- You should generate a random number and

  - 1/3 of the time have the fish move forward

  - 1/3 of the time have the fish turn right 0.125 instantly and then move forward

  - 1/3 of the time have the fish turn left 0.125 instantly and then move forward

- When the fish moves forward, it should randomly move some amount between 0.1 and 1.0, and it should happen quickly, 0.05 sec

7)Test moveRandom in myFirstMethod

- In myFirstMethod, next add a count loop to have the BlueTang move 10 times with the moveRandom procedure.

- It might go off screen that is ok.

8) Write a **Shark Procedure** called **catchMovingFish**

- There should be one parameter of type **Fish** named **target**

- Use a while loop. It should do in this order:
  - 1) have the shark repeatedly **point at** the fish's tail (**instantly**)
  - 2) at the same time, have the fish move random and have the shark move towards the fish (0.25 units), quickly in 0.05 sec
- The shark should stop when its mouth is close to the **fish's tail** (within 1.5). At that point open the mouth, and eat the fish (it should disappear), and close the mouth

9) Add more code in MyFirstMethod

- Since the fish that move random can go off screen, first have the camera set its vehicle property to the shark, so the shark will always be in view.

- Have the shark catch the blueTang, which is moving randomly

- Have the shark then catch the clownFish, which is also moving randomly.

Next slide, write a **scene** procedure

- In addition to writing specific object procedures, sometimes we will write a **scene** procedure. This may be the case when it has lots of objects in it and/or it doesn't make as much sense for an object to own it.

- The **scene** procedure cannot be saved and put into another Alice program.

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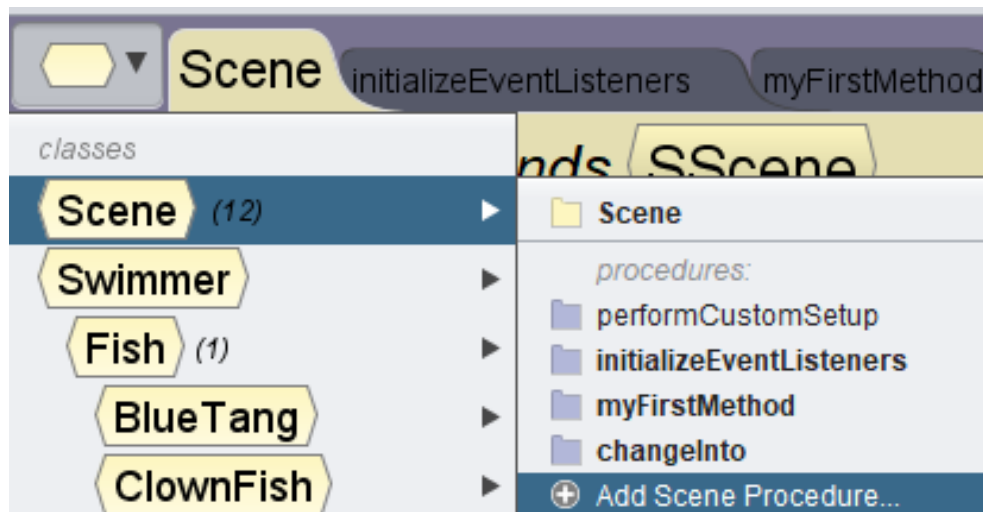
10) Write a **Scene procedure** named **changeInto**

- This procedure will take two objects and have one slowly turn into the other object.

- This procedure should have **two parameters** both of type **Swimmer** called **creature1** and **creature2**

- Creature2 should **already be** invisible. We want creature1 to turn into creature2.

- Follow the steps for the procedure on the next slide.

10) Scene procedure changeInto (cont)

- This procedure should:
  - Move creature2 into creature1 and have it face the same direction, instantly. (Hint: MoveAndOrientTo)
  - Move creature2 down 0.25, instantly, and then move creature2 forward 0.25 instantly. (adjust so can see it better)
  - Use a **while** loop to repeatedly make creature1 less visible (by 0.22) and at the same time make creature2 more visible (by 0.22).
    - Hint: Set the creatures opacity values to their current values plus or minus the 0.22
  - The while loop should stop when creature 1 is almost invisible (0.2 or less opacity).
  - When the while loop finishes be sure to then set creature1 to all invisible and creature2 at the same time to all visible.

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11) Now complete the story in myFirstMethod

- Make the shark invisible, don't need it anymore.

- Make the blueTang completely visible.

- Have the camera look at the blueTang (hint: use camera moveAndOrientToAGoodVantagePointOf)

- Have the blueTang changeInto the babyWalrus

- Then have the blueTang say "I'm now a baby walrus"

- Then change the walrusBaby into a dolphin

- Then have the dolphin say, "I'm now a dolphin"

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That's it!