Programming With Alice

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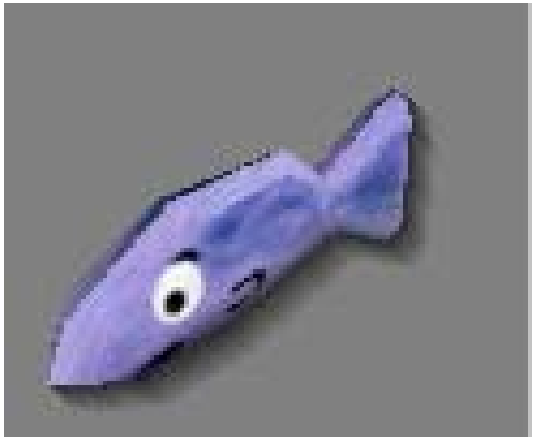
Alice

- Alice is a simple programming environment that allows you to create 3D movies.

- If not logged in:
  - move mouse to wake up computer
  - click "Logon" button
  - use your provided login id and password (FB01 – FB60), password, byte
  - click the "OK" button
  - Select **Start -> Programs -> Programming -> Alice**
  - It takes a minute to load

Creating an Alice Program

- You can either try to create a movie on your own
- OR the handout describes the steps necessary to build an Alice program with a simple version of the charades scene from ***Finding Nemo***
- Any questions, please ask!

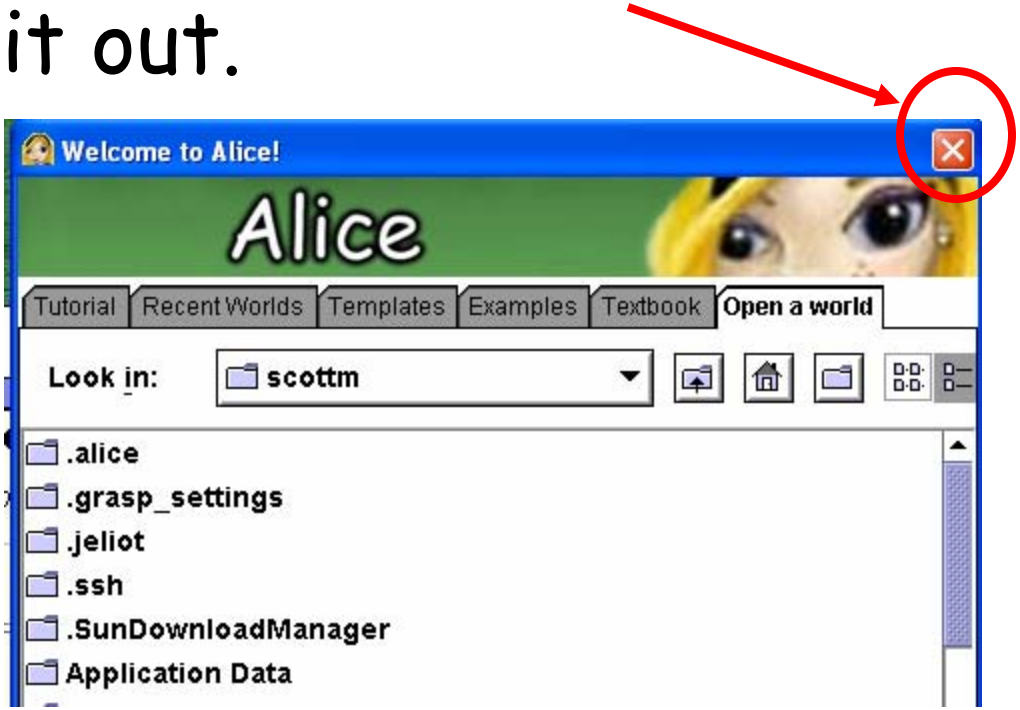


An Extended Example

- These slides step you through an extended example to learn the basics of programming in Alice
- To do your movie you will need to generalize some of these things.
  - apply them in a slightly different way
- Feel free to try and do something else

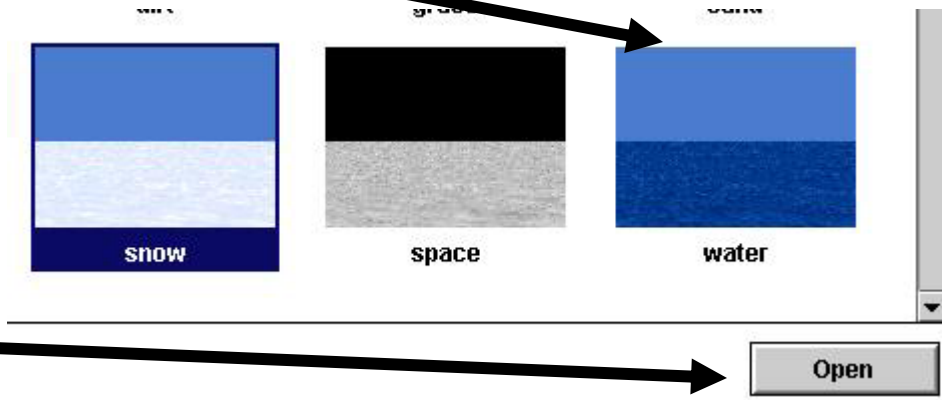
Getting Started

- Close the opening splash screen by x-ing it out.



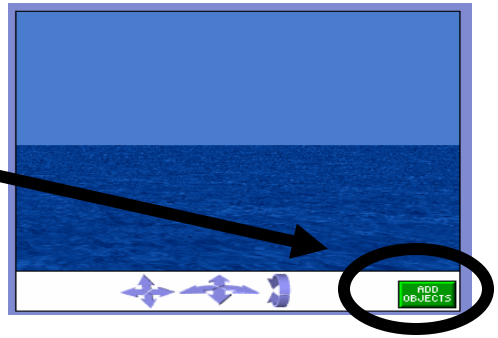
Create an Alice World

- Start Alice
- Select "File", "New World"
- Click on Water picture
- Click on "Open"

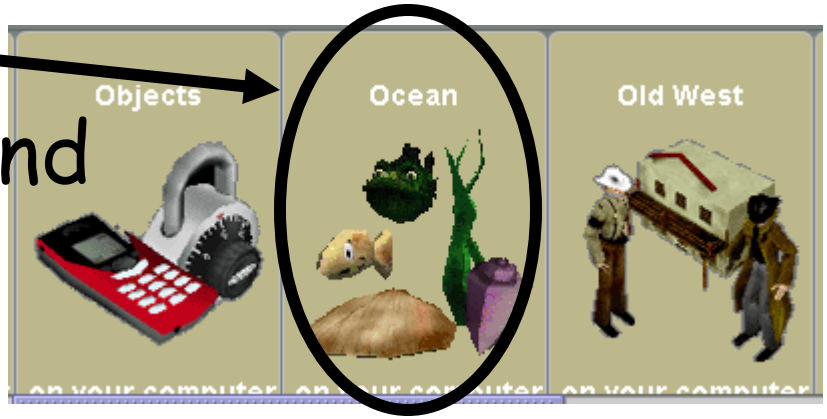


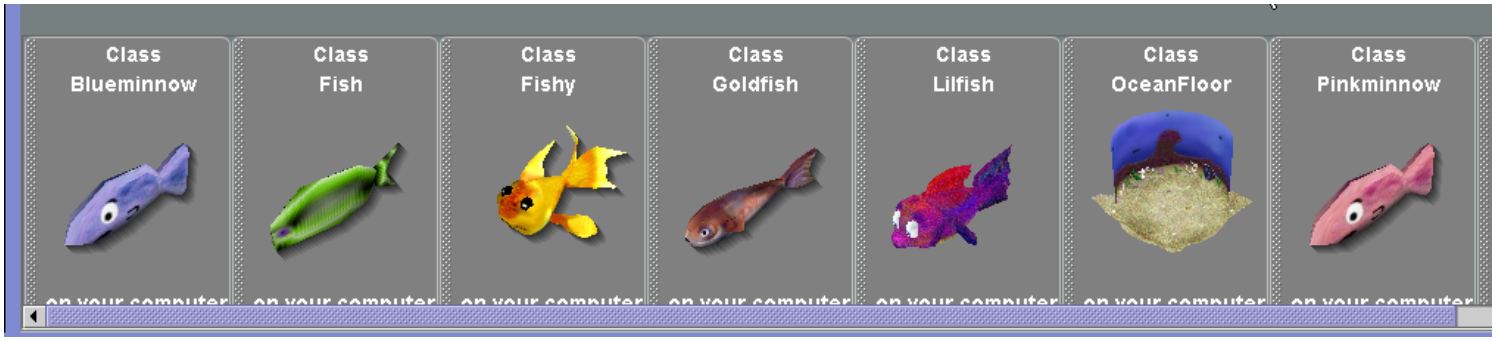
Find Fish objects

- Click on "add objects"



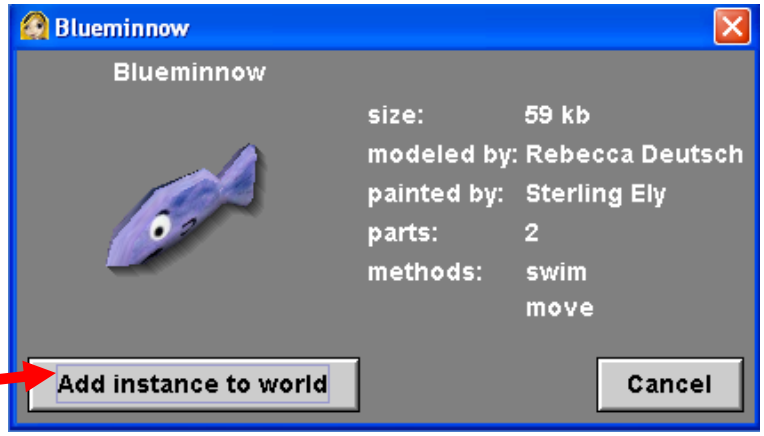
- Scroll over to "people" folder and click on it





Add Blueminnow to World

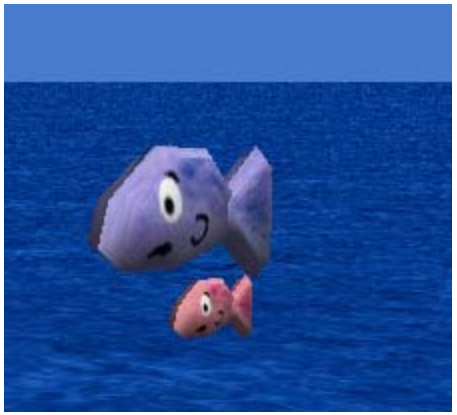
- Click on Blueminnow (for Dory) and you will see:
- Click on "Add instance"



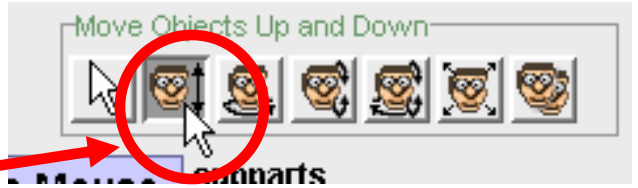
- Blueminnow appears in world
- Can also add my clicking on object and dragging into scene

Add Pinkminnow to world and adjust

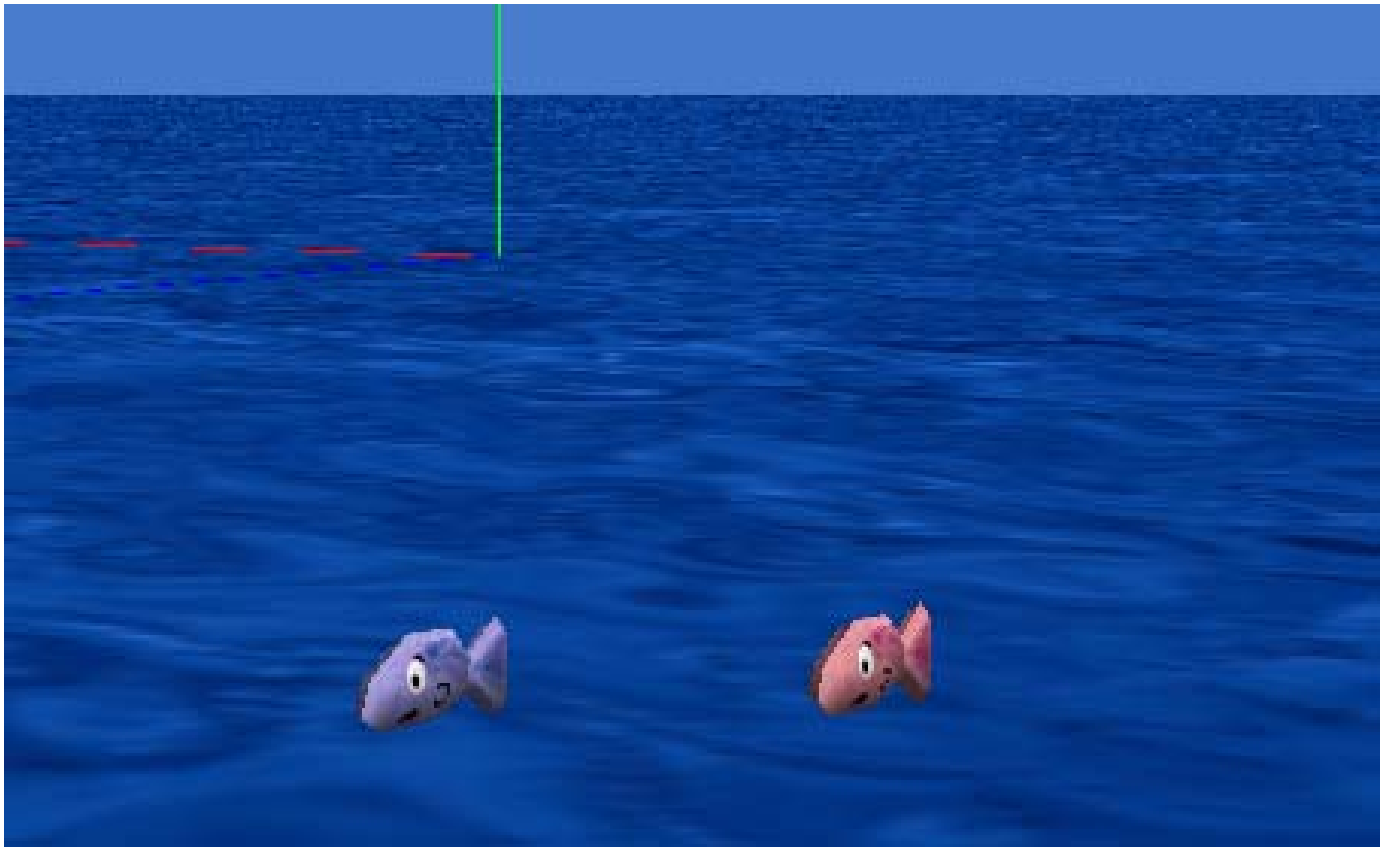
- Click on Pinkminnow (Marlin) and add to the world



- Click on arrow key
- Click and hold on fish to move.
- Click on move up and down to move fish up and down. (Okay if not in water.)



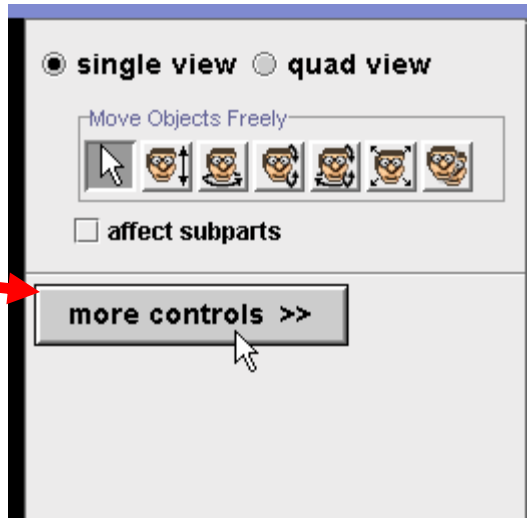
Position fish and camera so world should look something like this:

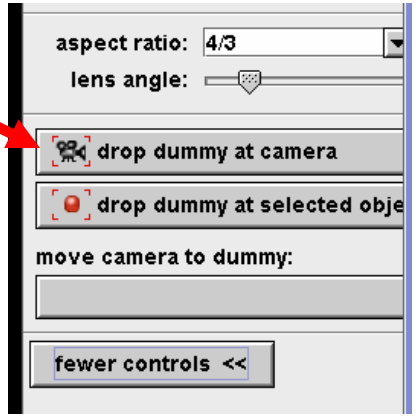


Not sure why placed so high initially!

Add Dummy Object

- When setting up a scene it is often necessary to move camera and then return to original position.
- Click the ***more controls*** button
- Select the ***drop dummy at camera***



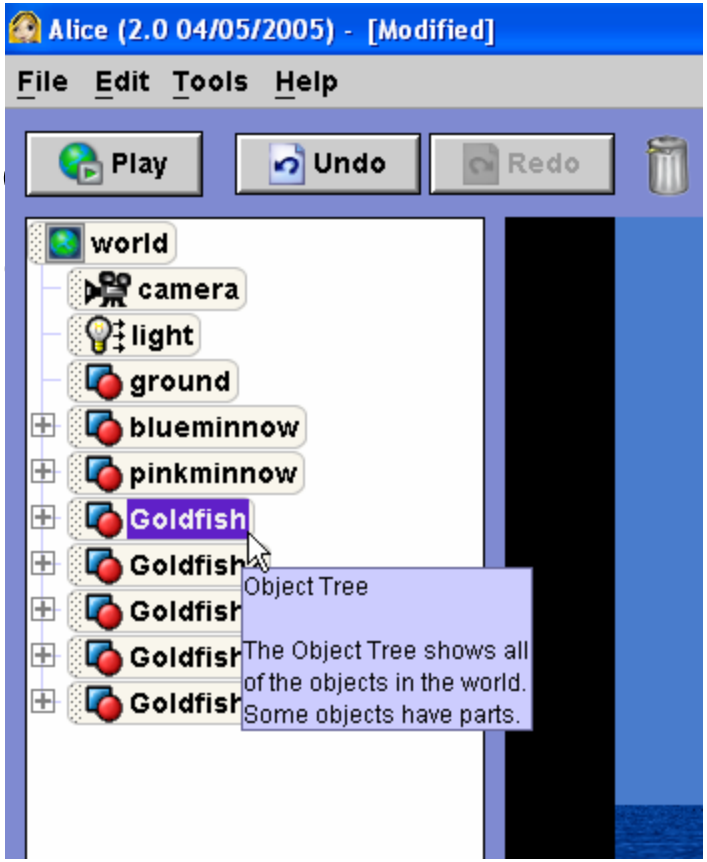


Add More Fish

- Add 5 Goldfish to world to be the school of fish
- Clicking and dragging into scene works better.

Move School of Fish Down

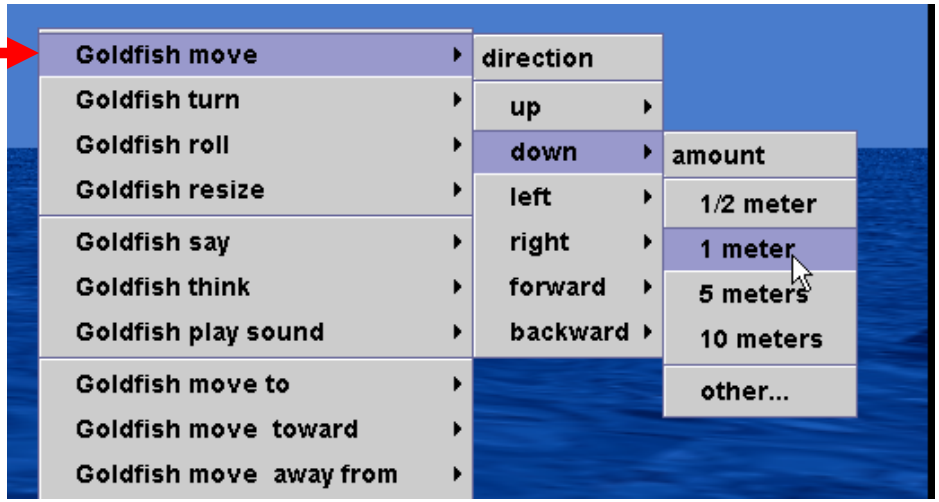
- In our movie the school of fish will appear later. We want them to disappear now.
- Could use the move down arr to move below surface but w want them all to move down same amount.



Move School of Fish Down

- Select each Goldfish from **Object Tree** and drag into scene

- From pop up menu choose **move**, then **down**, then **1 meter**



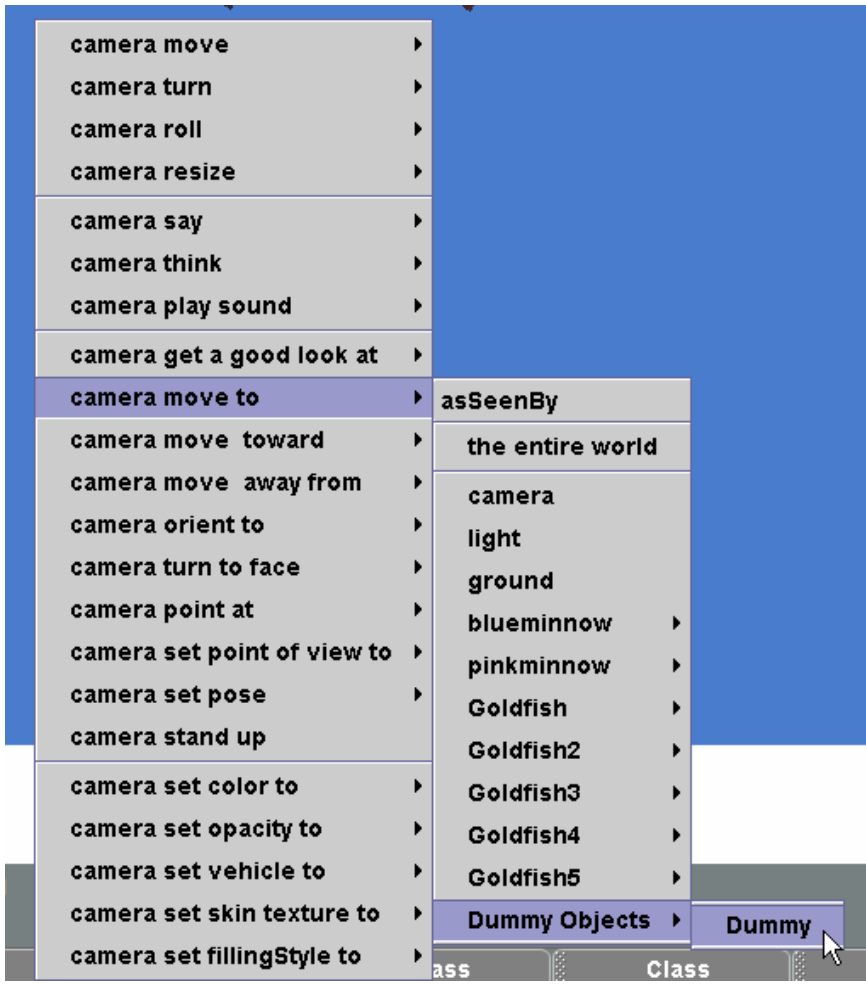
Position Dory and Marlin

- Move Dory and Marlin a little to the left as looking at the scene and rotate them

Setup Done!

- All goldfish are below surface of water, but still part of world.

- Could move camera down to see goldfish.
- To return camera to start position drag camera into scene and select moveTo command and select dummy from menu and then select the orient to command to return camera to original position



Save World

- Select the file option from the menu and the select Save world: File -> Save World

- Type in a name such as: nemo and then "save"
- Alice will remind you to save your work every 15 minutes

Now Ready to program!

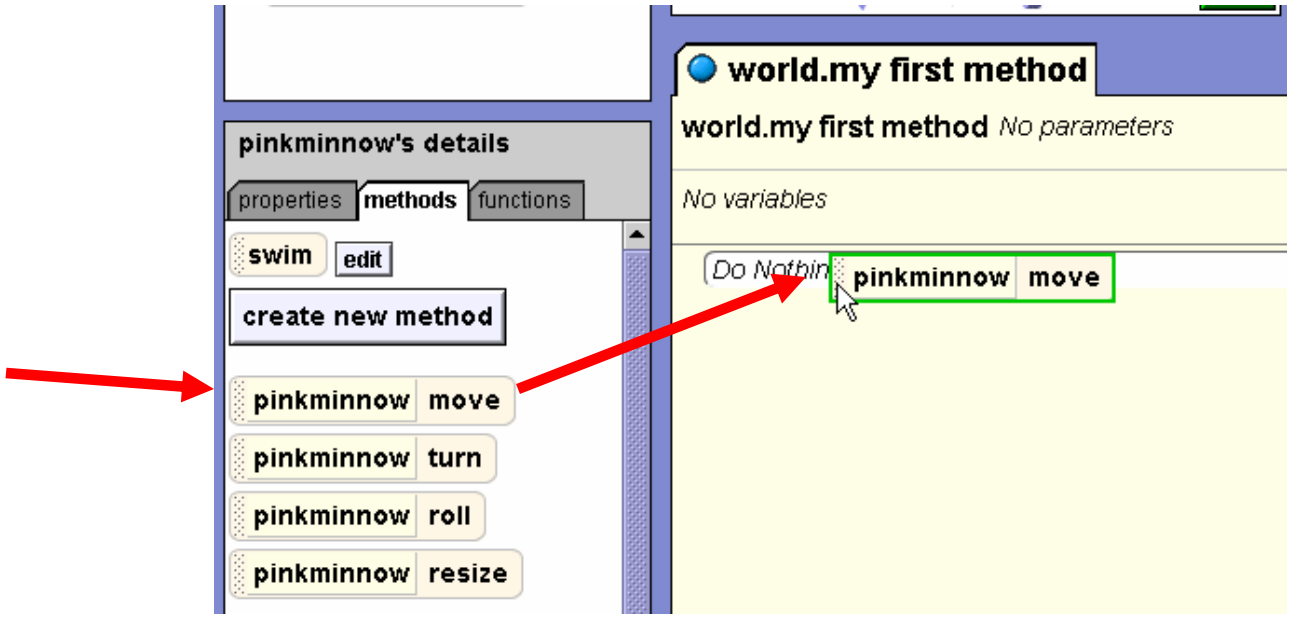
- Click on done
- Should now see myFirstMethod

Make fish move

- This is the *object tree*, a list of all your objects in the world
- Now click on the word "pinkminnow" to highlight it
- You should see methods below it (things the snowman can do) such as move, turn, roll, …

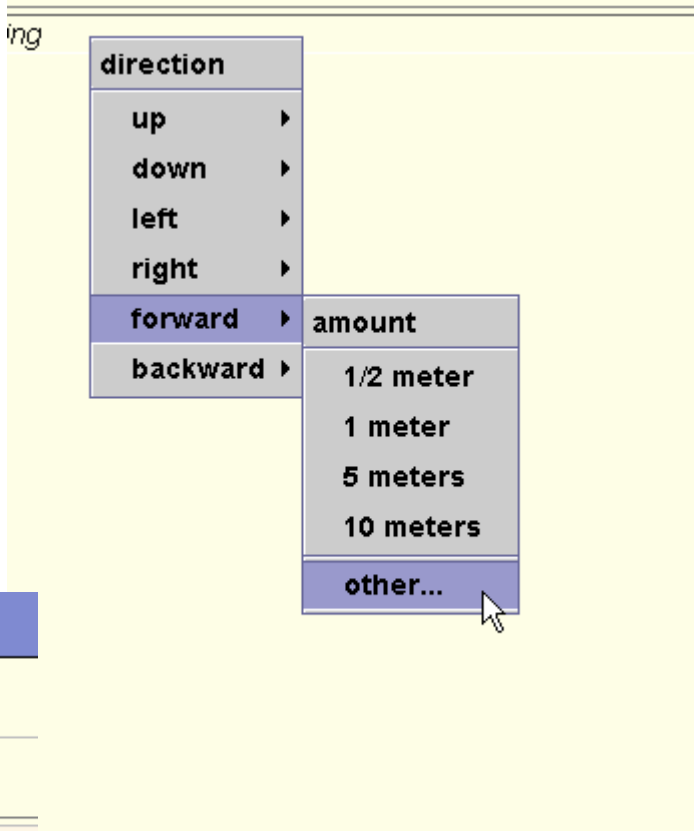
Add code to move fish

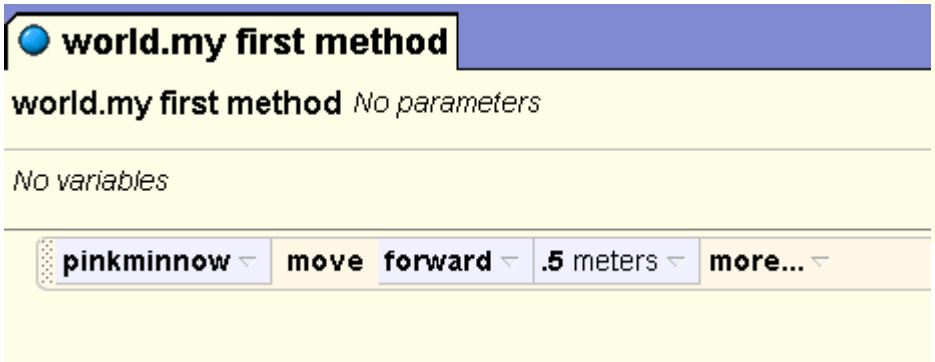
- Click left mouse button on ***pinkminnow move*** AND HOLD IT DOWN, then Drag it over to the World.my first method and release the mouse button



Move fish

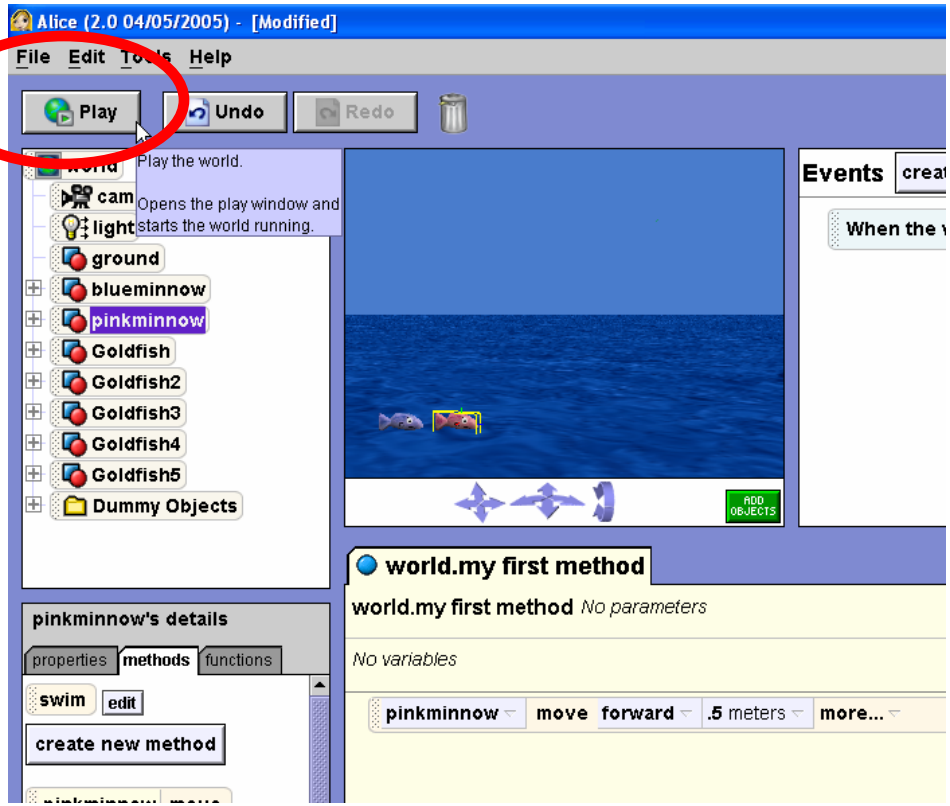
- From the pop up menu select ***forward*** and then ***other***
- In the calculator that pops up type in 0.5
- You have added a command!





Run the Program

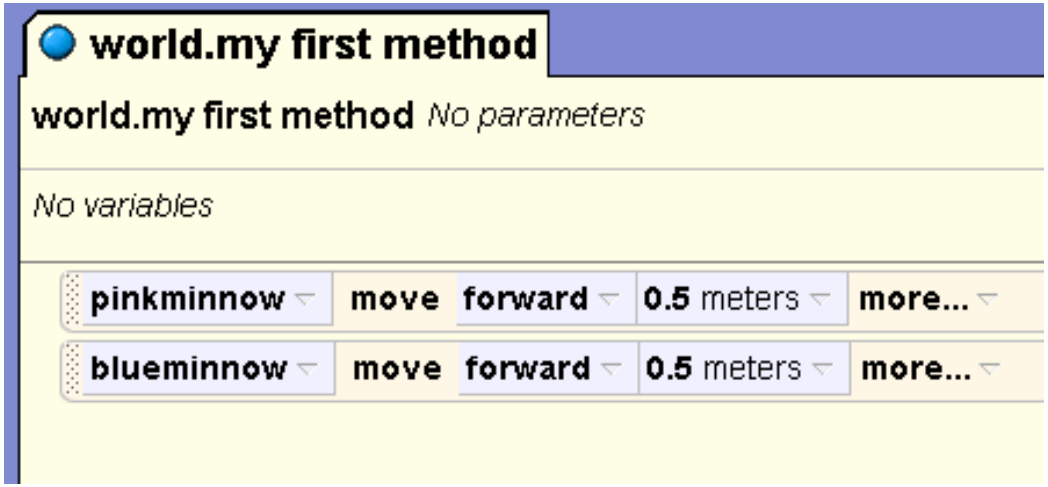
- Click on Play



Close the movie player by x-ing it out when you are finished to go back to programming.

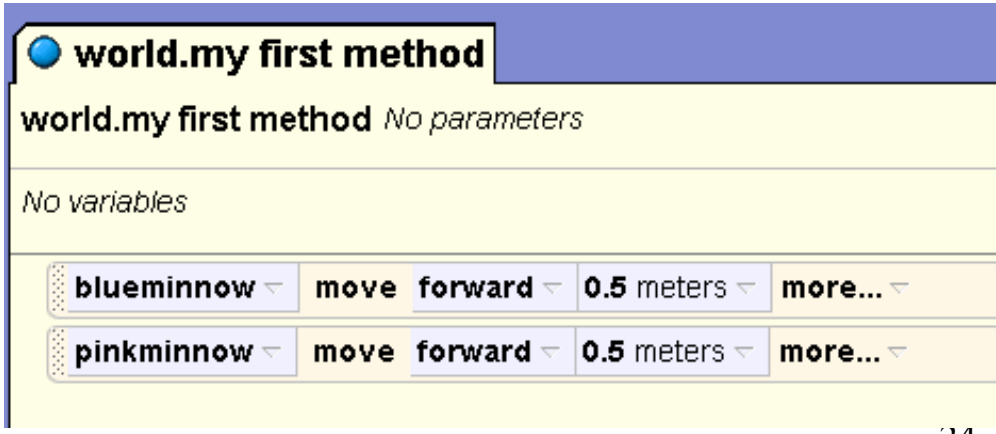
Have Dory move

- Select the blueminnow in the object tree and drag over a move command for it. Place it after the command for the pickminnow
- Code is now:
- Play again



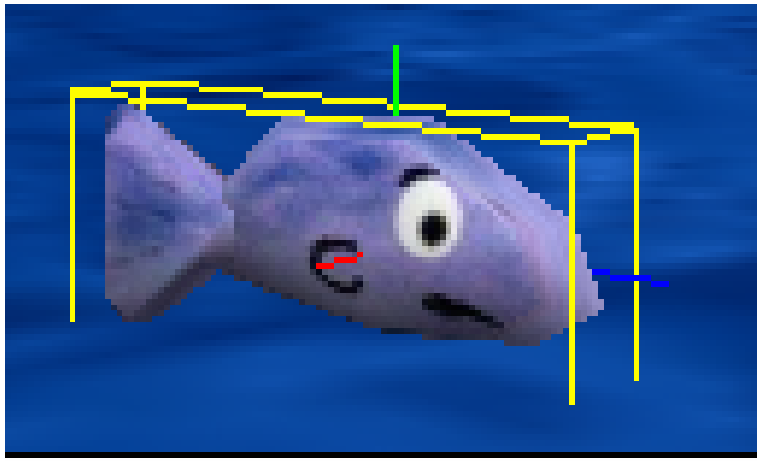
Sequential Execution

- Commands in the program are carried in the order they appear.
- Alter order of movement so Dory moves first and play movie. Click and drag commands in the My first method screen
  - See the difference?



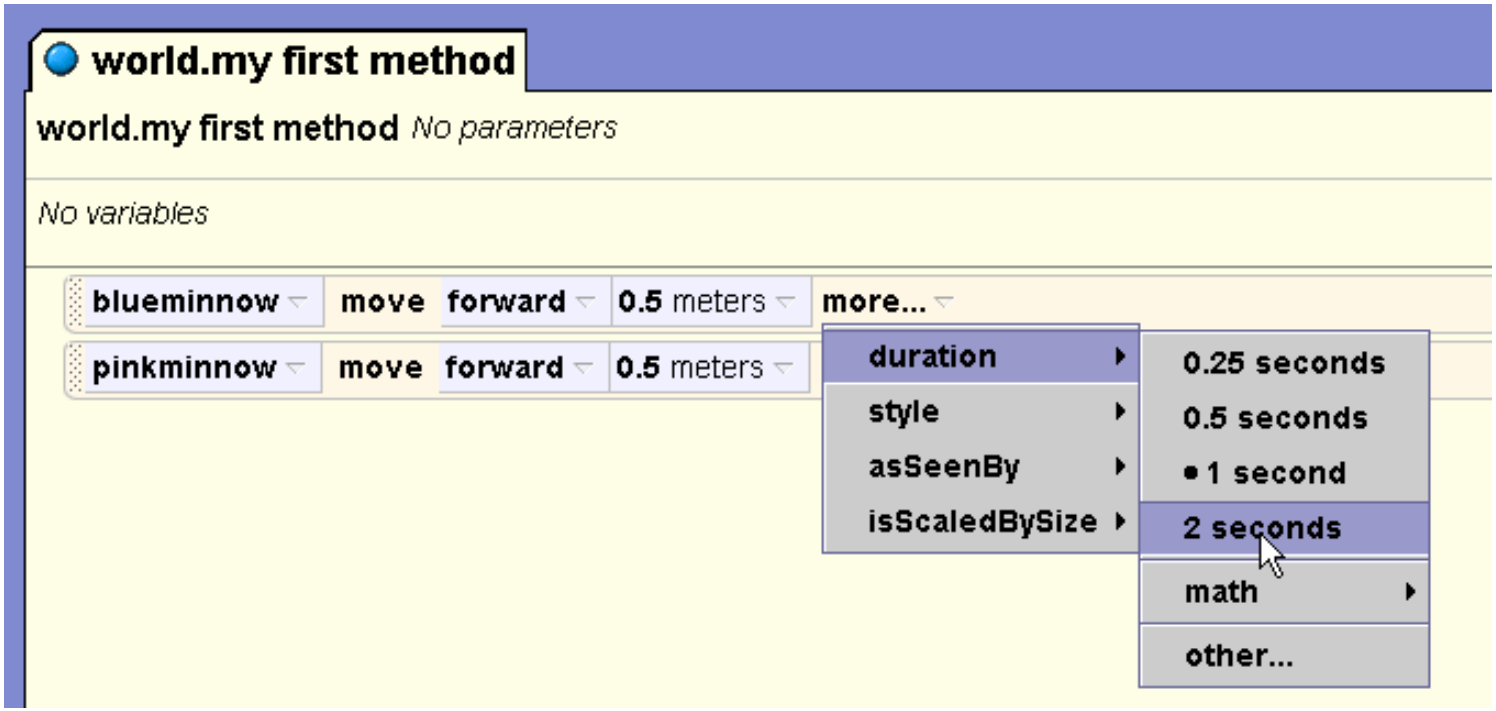
Movement

- All movement for Alice objects is based on their own frame of reference.
- Moving fish forward based on what they think is forward
- Blue: forward
  Red: right
  Green: up



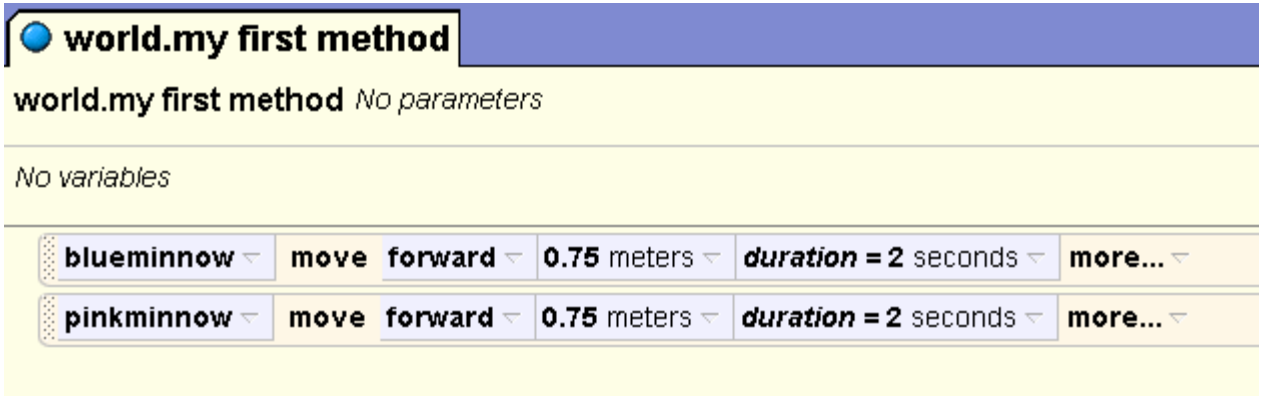
Duration

- Can change duration of actions by clicking on ***more*** drop down menu in command and picking duration.



Changing amounts

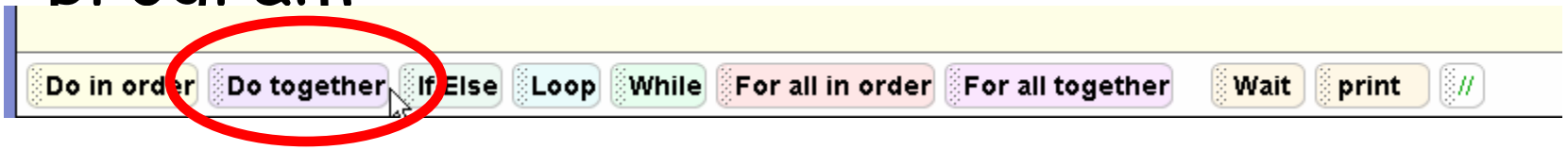
- Can also change amounts by clicking on drop down menu for command.
- Change movement from 0.5 to 0.75 meters

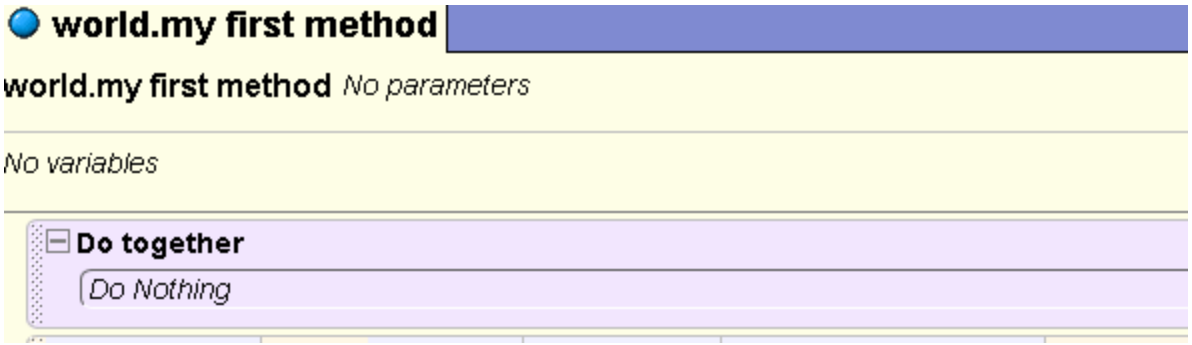


- Play movie

Move together

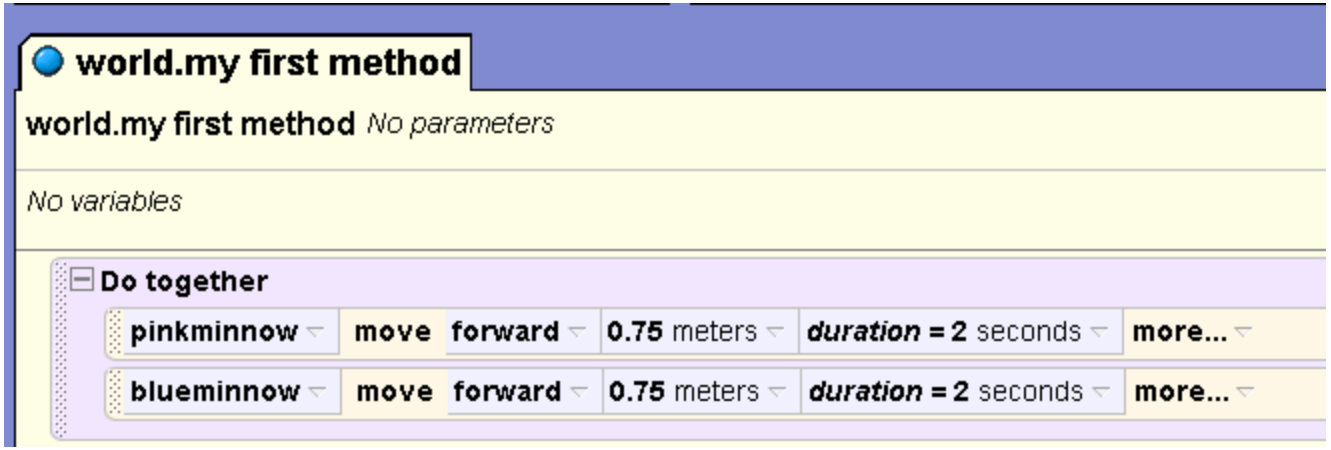
- To get the fish to move together drag a ***Do together*** command from the bottom of the window into the program





Move together

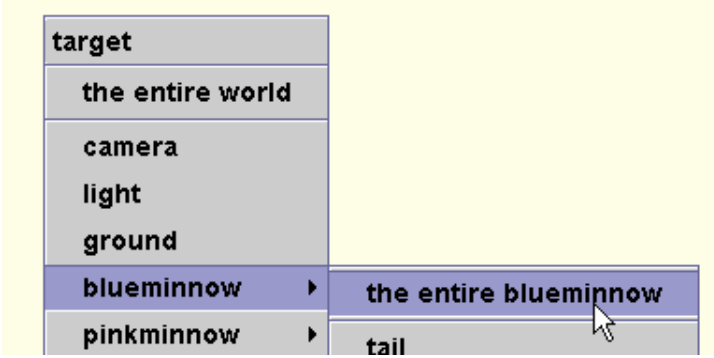
- Drag both move commands into the ***Do together*** block
- Play!



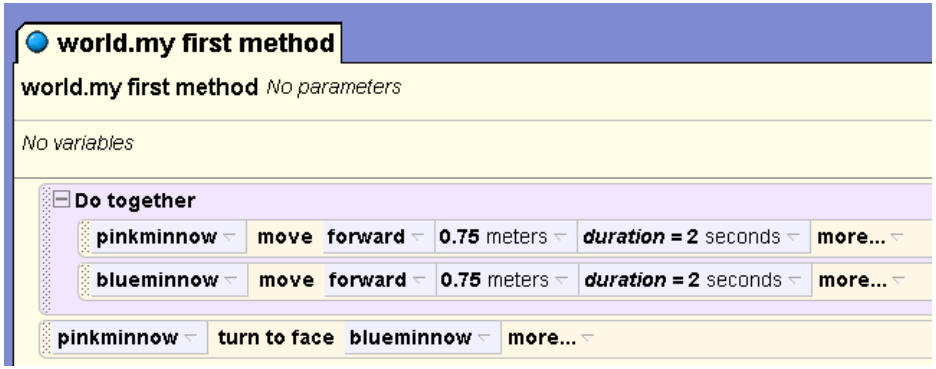
- Order inside do together does not matter

turn to face

- Click on pinkminnow to see methods
- Select the ***turn to face*** method from lower in list and drag into program after the move commands
- Select blueminnow from the popup



- Play!

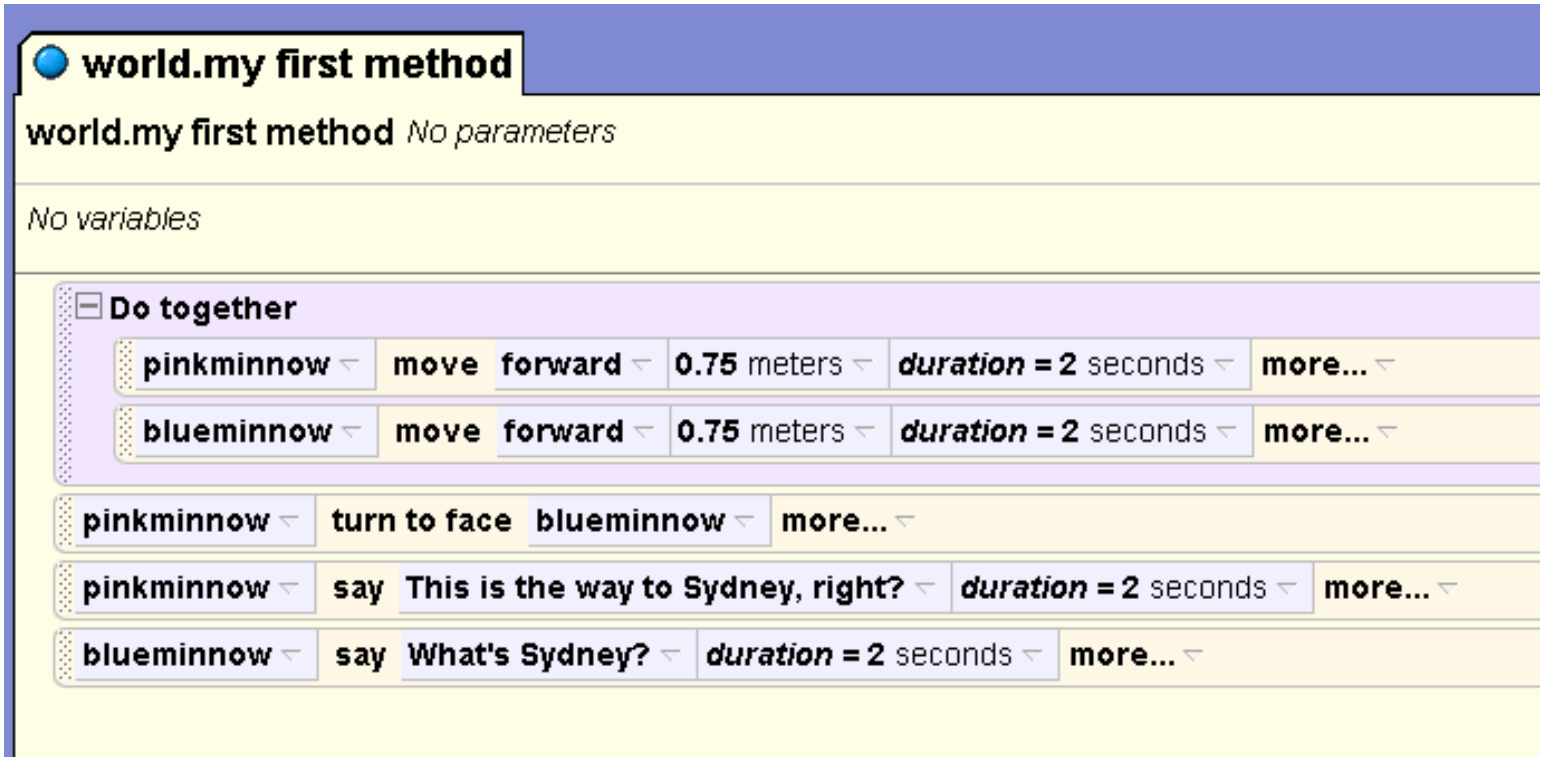


Have fish talk

- Have fish talk to each other.
- Drag ***say*** command for pinkminnow and pick ***other*** from menu.
- Type in question.

- Select blueminnow and type in response: What's Syndey?

Program so far



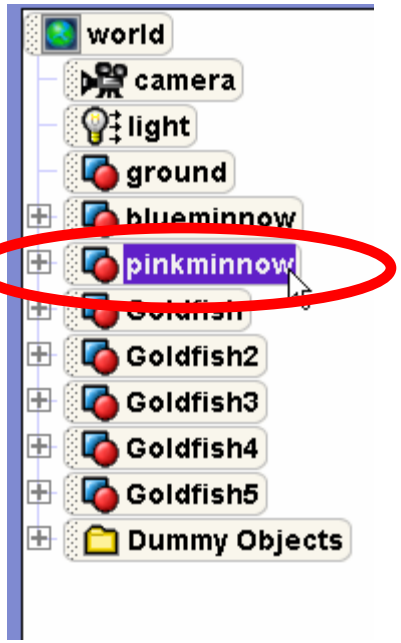
- Play!

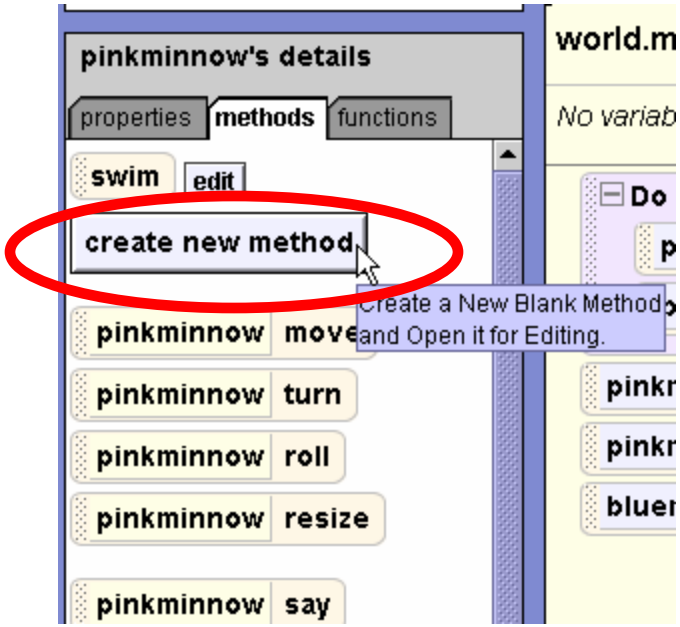
Adding methods

- Program getting longer.
- We are going to have Marlin react to Dory forgetting what Sydney is.
- We are going to repeat his reaction twice
- To try and keep program simple and to reuse commands we are going to make a new method for Marlin,

Add a New Method

- Select pinkminnow in object tree
- In method tab click the ***create new method*** button.

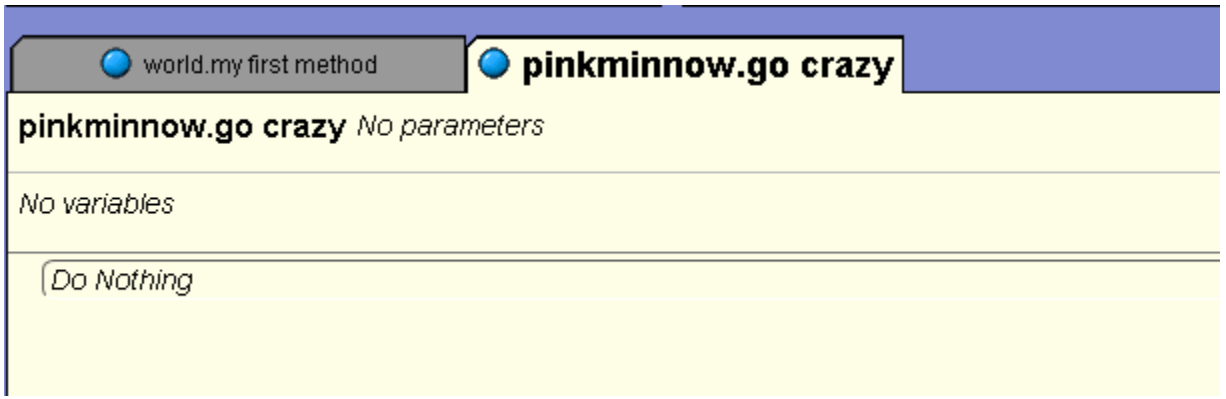




- Name new method ***go crazy***

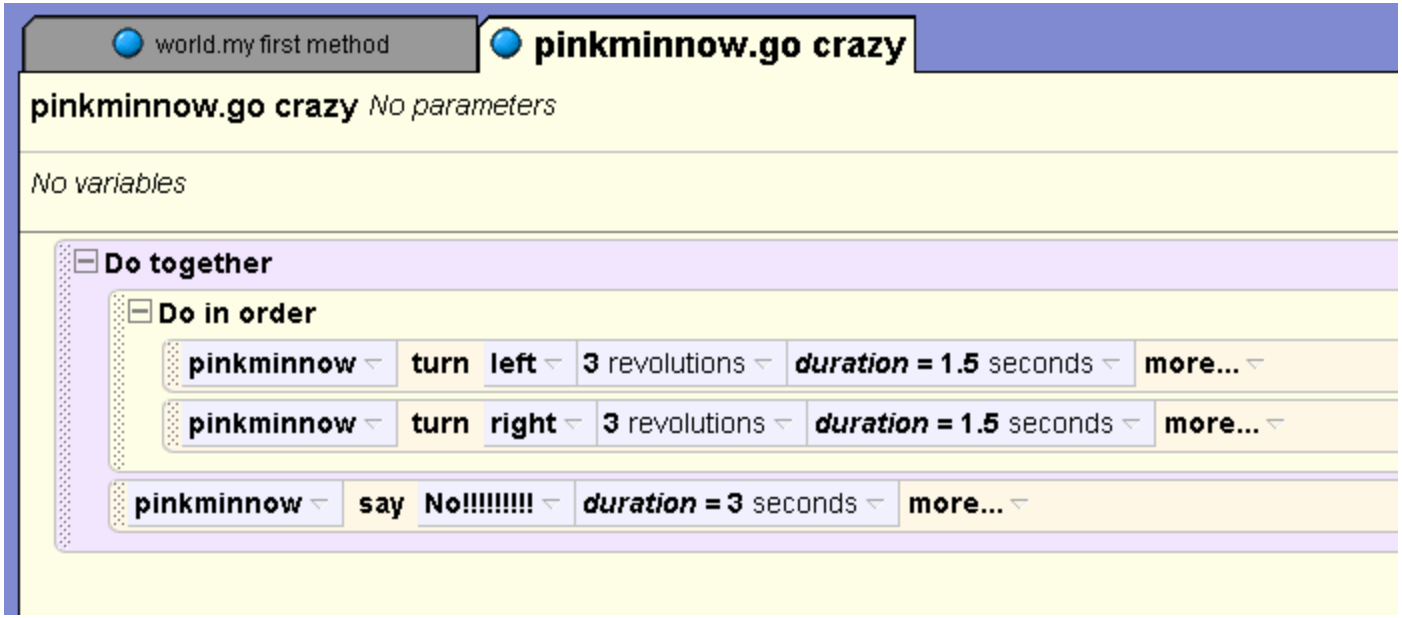
Go crazy

- when creating new method a blank program screen pops up



- Add commands to this method
- Have Marlin turn around 3 times to the left in 1.5 seconds, then 3 times to the right in 1.5 seconds while saying NO!!!! at the same time

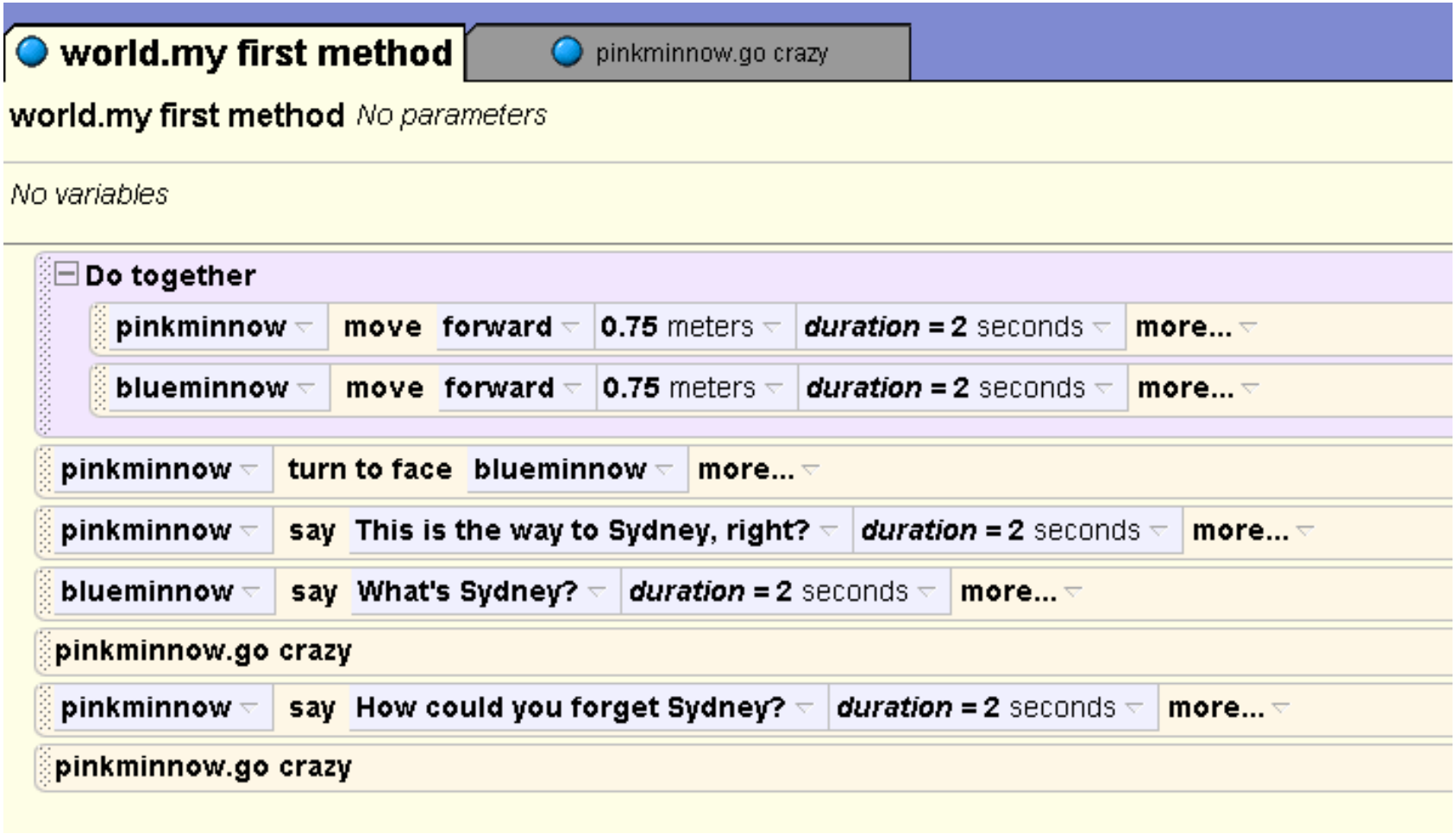
Completed go crazy



Call go crazy

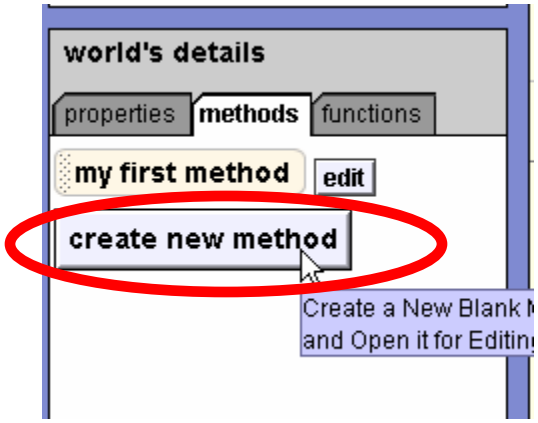
- Select the My first method tab to go back to the main program
- Call the go crazy method
- then have Marlin say "How could you forget Sydney?"
- then call the go crazy method again

Calling new method



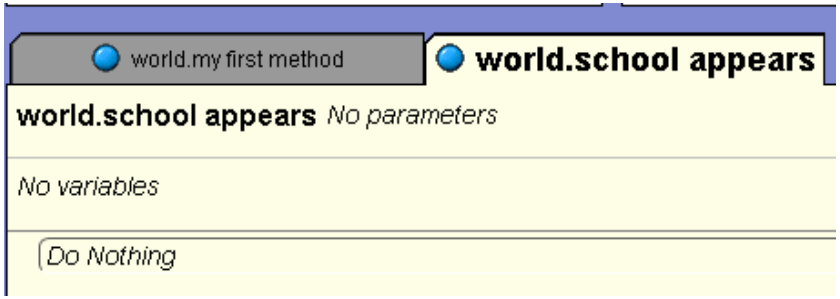
Move School of Fish Up

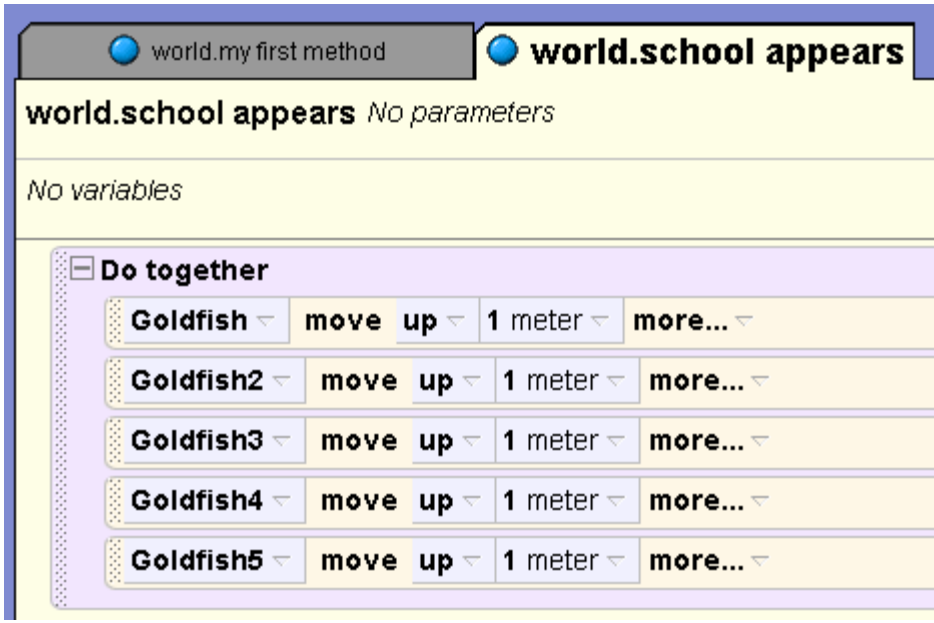
- Now have the school of goldfish appear.
- They will all have to move up 1 meter at the same time.
- When a method involves more than one object it should be a world level method. (go crazy was a class level method.)
- Select ***world*** from object tree and ***create new method*** from the object tab



World Level Method

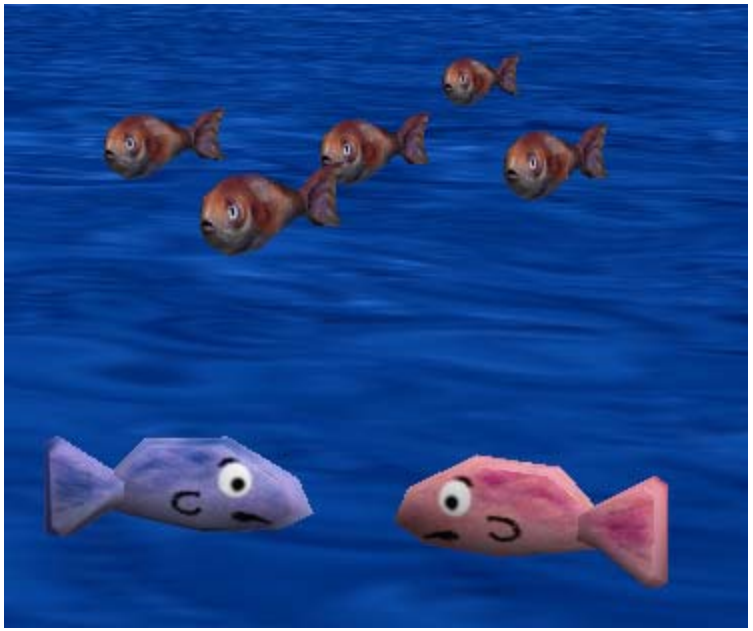
- Call the new method school appears.
- Add a do together block and a command to move each of the goldfish up 1 meter
- Call the method in my first method
- Play!





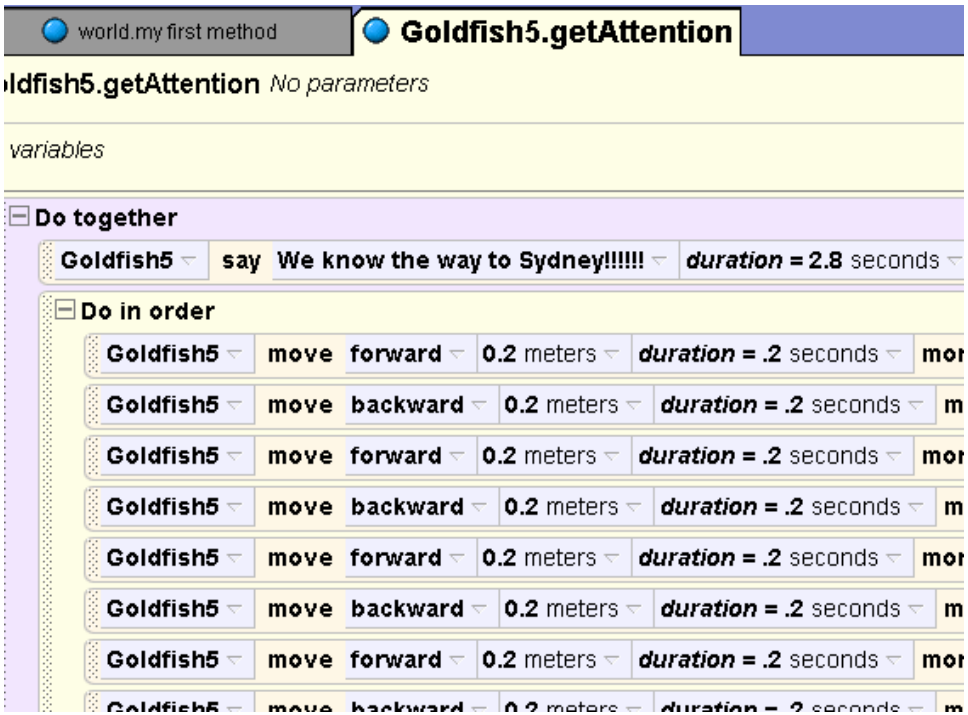
Get Attention

- The leader of thge school of fish want sto get the attention of Dory and Marlin
- He is going to move forwards and backwards 7 times quickly while saying "We know how to get to Sydney!"



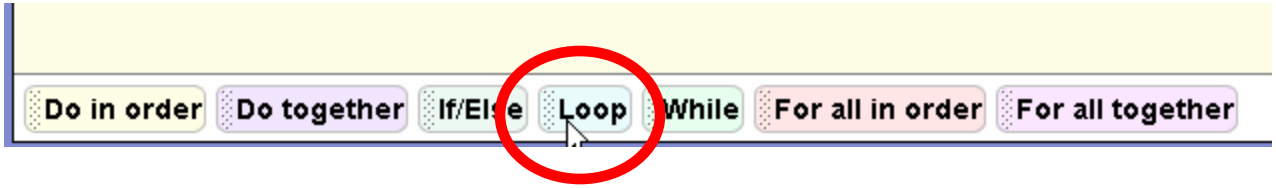
Repeated Actions

- Create a method for the goldfish at the front of the school named get attenetion
- One way would be to use multiple moves as shown, but don't do this!

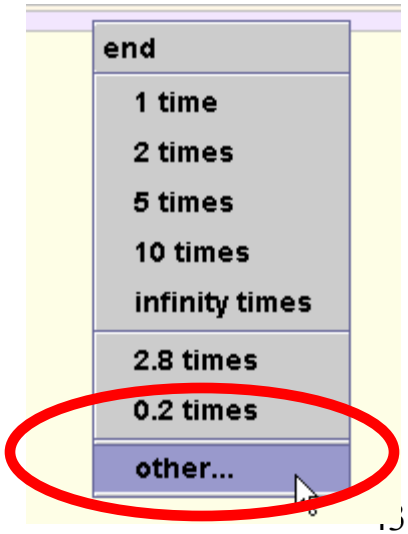


Loops

- Previous approach is cumbersome
- Instead, use a loop!
- Drag ***Loop*** from bottom of commands to ***do together*** in ***get attention*** method

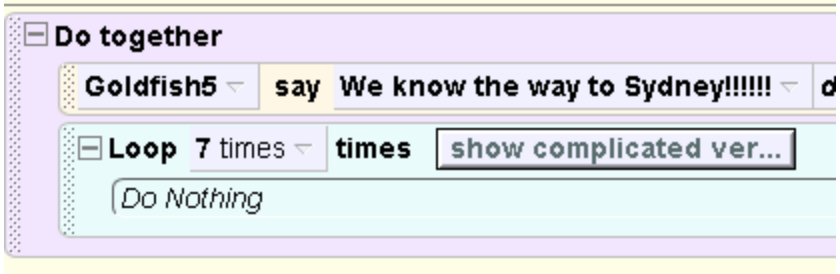


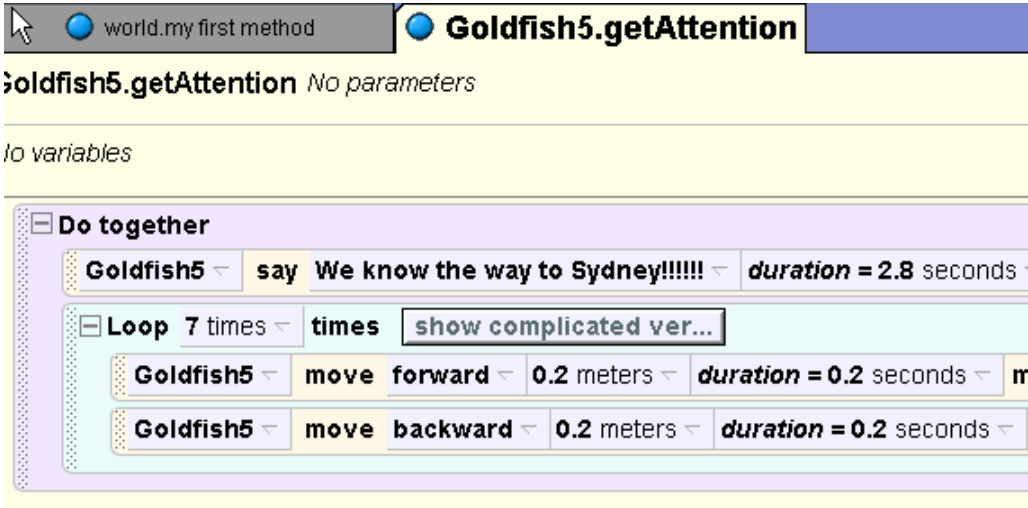
- Set number of times to 7 by using other choice



Loop

- Now add a single move forward and backward command to inside the loop.
- Call ***get attention*** method in ***my first method***
- Play!
- Make sure times match for say and total movement back and forth. 2.8 seconds



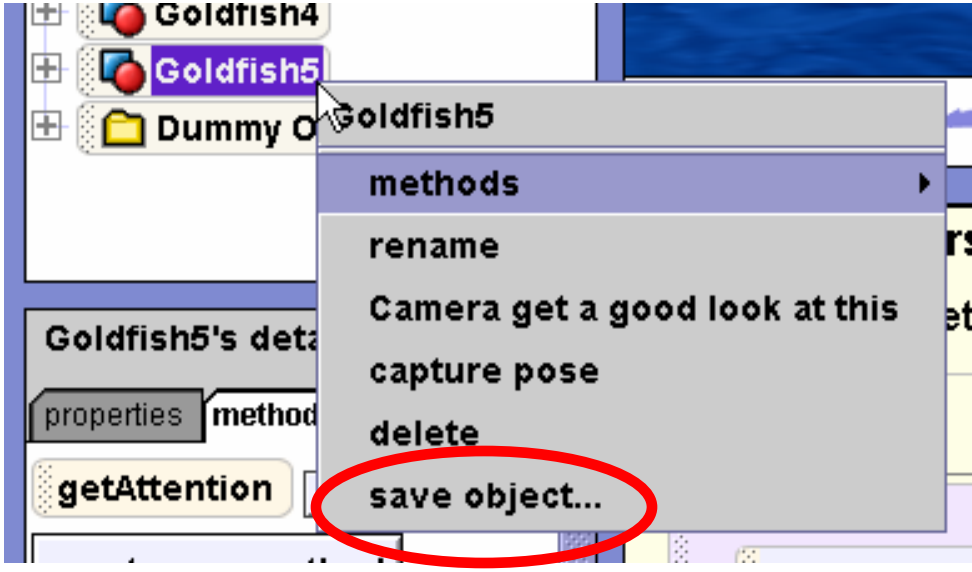


Saving new classes and objects

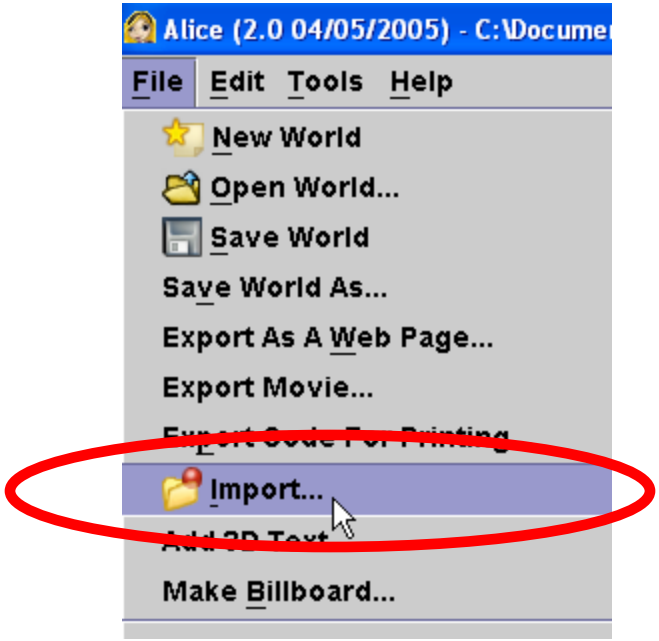
- Creating the ***get attention*** method for one goldfish does not give the other goldfish that method.
- But we could save a new class with the get attention method and then add objects of that new, smarter type to our program.

Saving New Classes

- right click on goldfish in object tree with ***get attention*** method and select ***save object***
- Name new class ***Smart Goldfish***



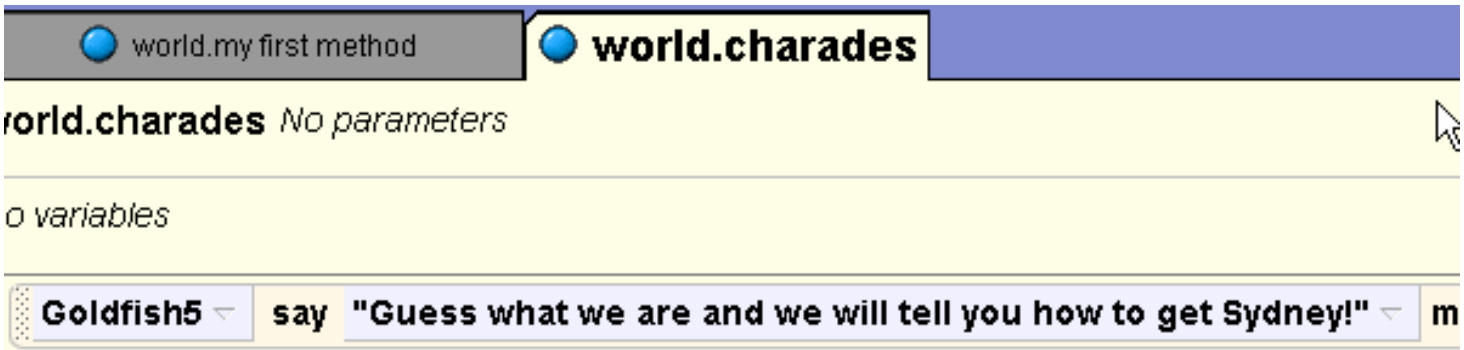
Using New Classes



- To add objects of the new type to a world go to the ***add objects*** window
- Select file from the top menu and ***Import***
- Browse to the location of the file and select it. A copy will be added to the world
- This feature can be used to allow people to work on different parts of a world / movie.

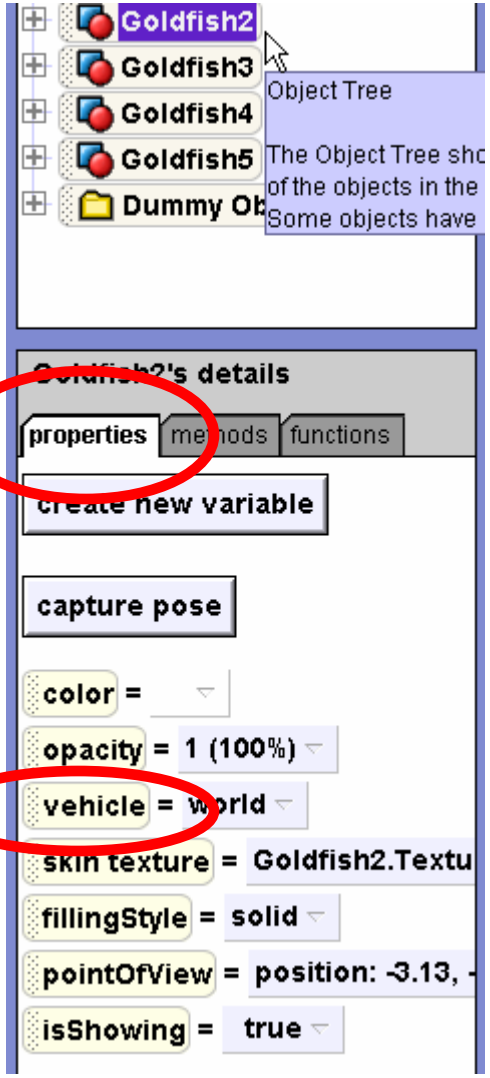
Charades!

- Create new world level method named charades
- Start by having the lead goldfish say "Guess what we are and we will tell you how to get Sydney!"



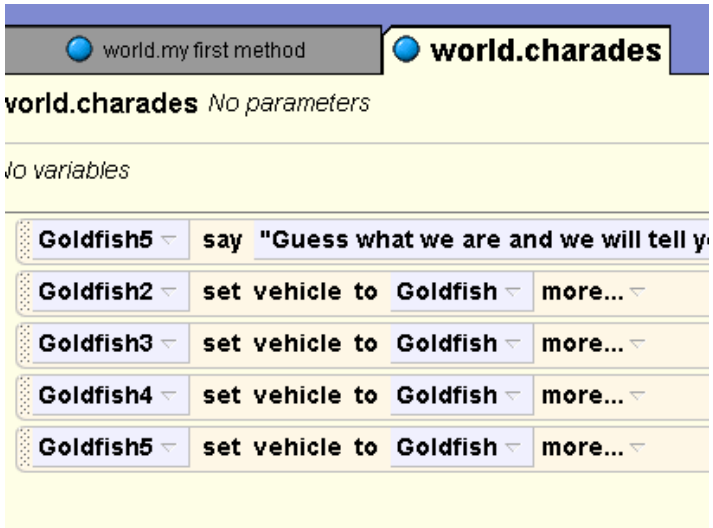
Changing Properties in the Program

- The school of fish are going to pretend to be a propeller.
- This can be done easily by changing the **vehicle** property of the fish
- Select each fish besides the center fish from the object tree
- Select the properties tab
- Drag vehicle property into charades method and change to goldfish at center



Change Vehicle Property

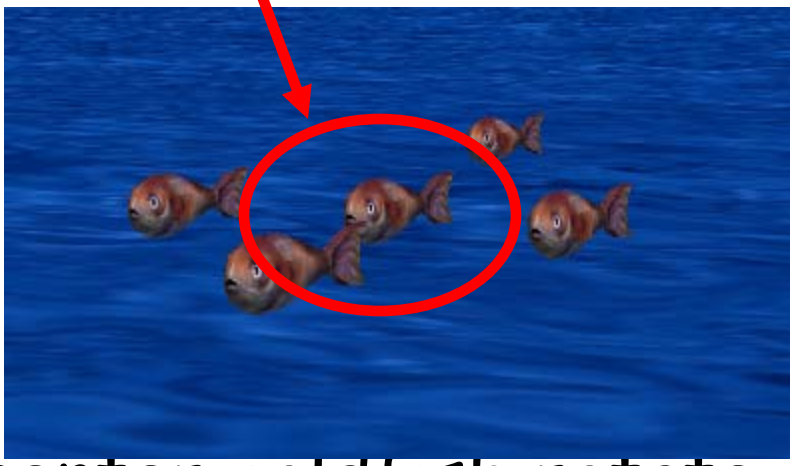
- Select ***entire Goldfish***
- Repeat for all the other goldfish except the one at the center of the group



Effect of Vehicle

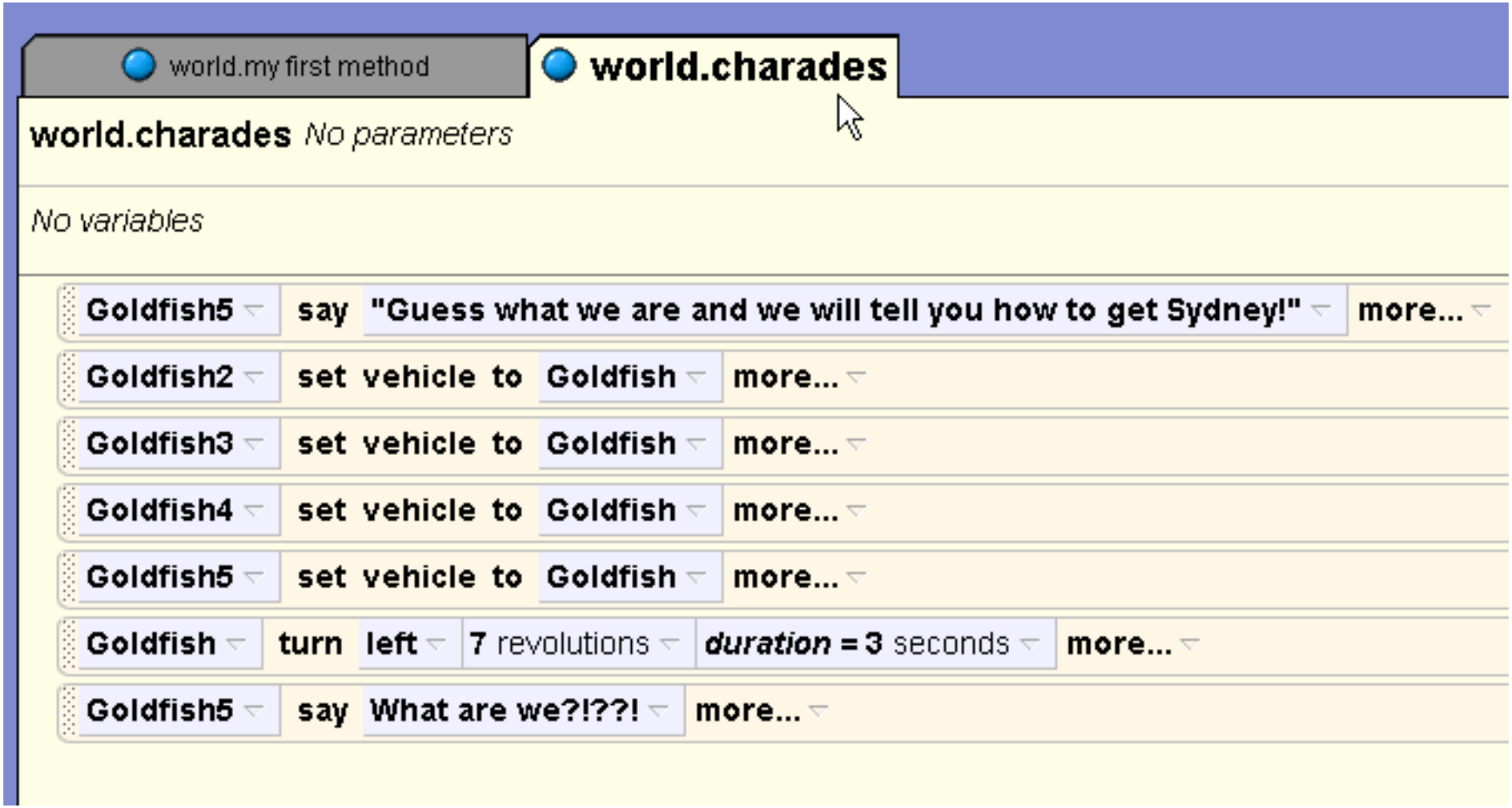
- Now that the center goldfish is the vehicle for all the other goldfish when it moves the other goldfish move as if they were attached to that goldfish

when this goldfish moves others move as if attached

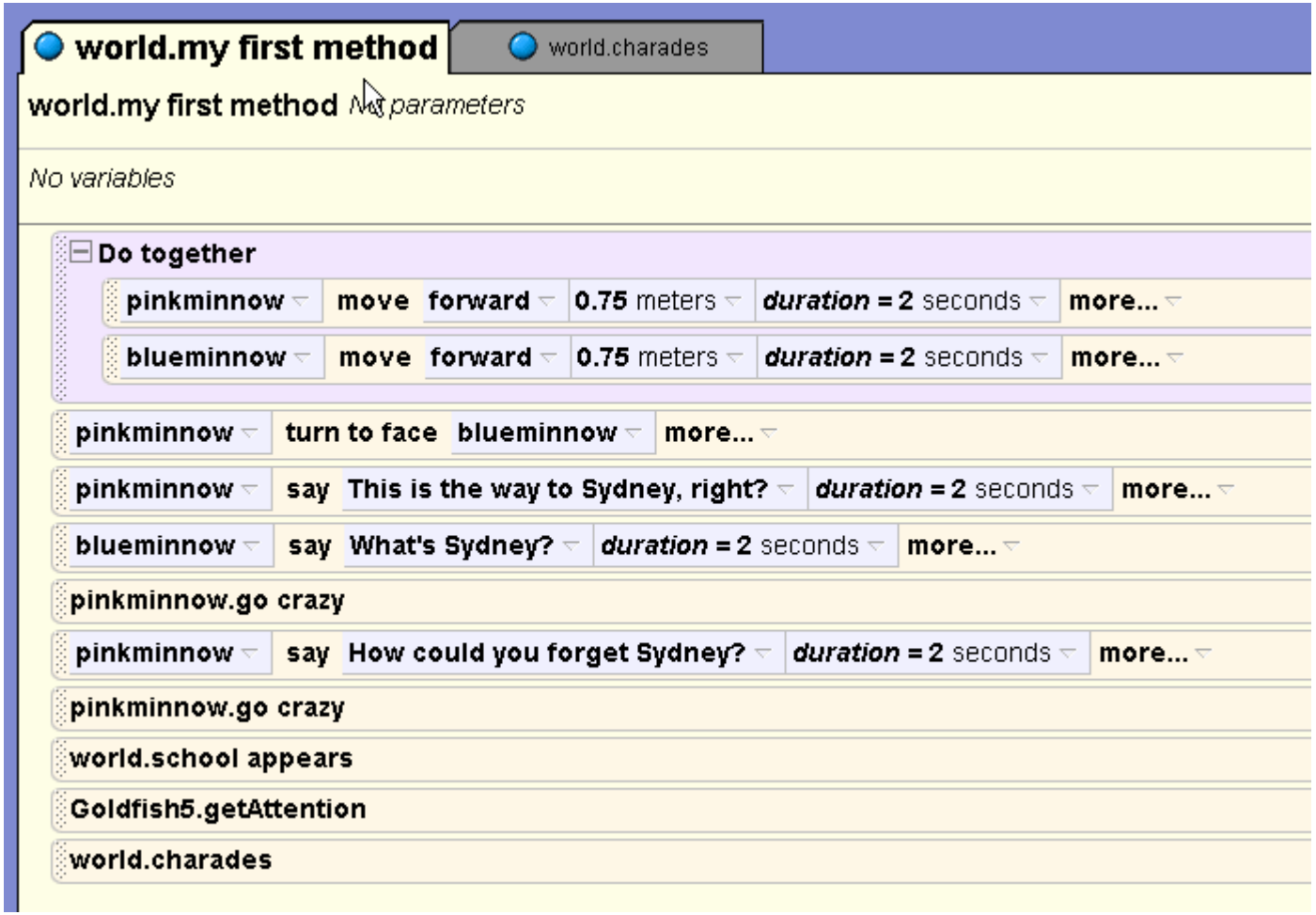


- In charades method have center goldfish rotate around 7 times
- Call ***charades*** from ***my first method*** and PLAY!
- Other properties can be changed as well (Color, isShowing, opacity)

Completed *charades* method

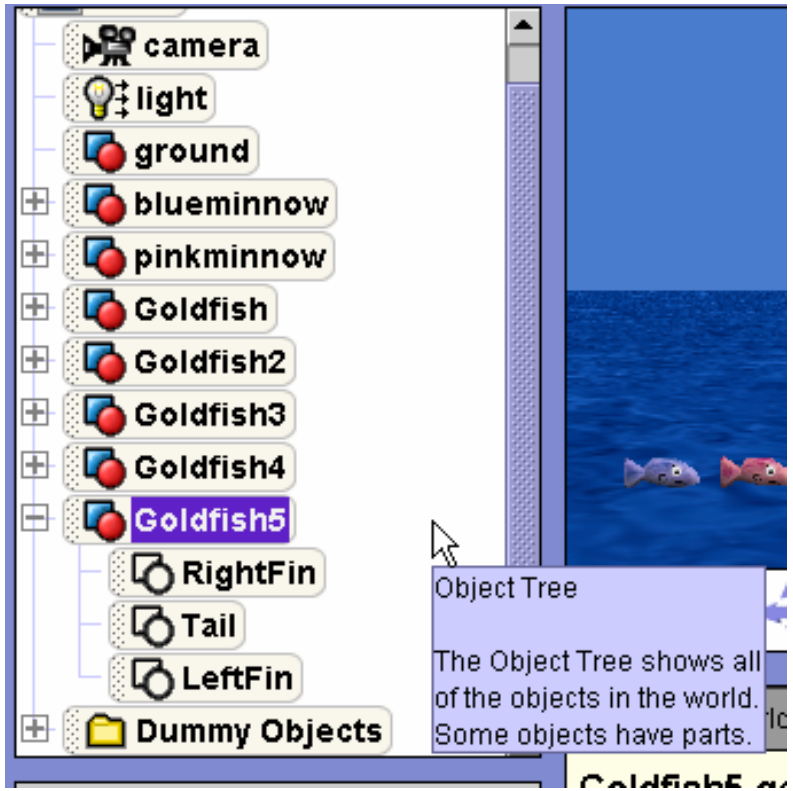


My first method so far



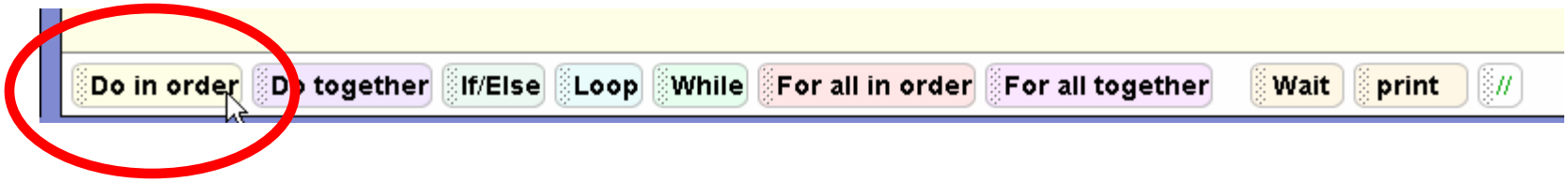
Affecting subparts

- Go back to the ***get attention*** method for the lead goldfish
- We want the goldfish to move its tail while going back and forth
- In the object tree select the lead goldfish and expand the object



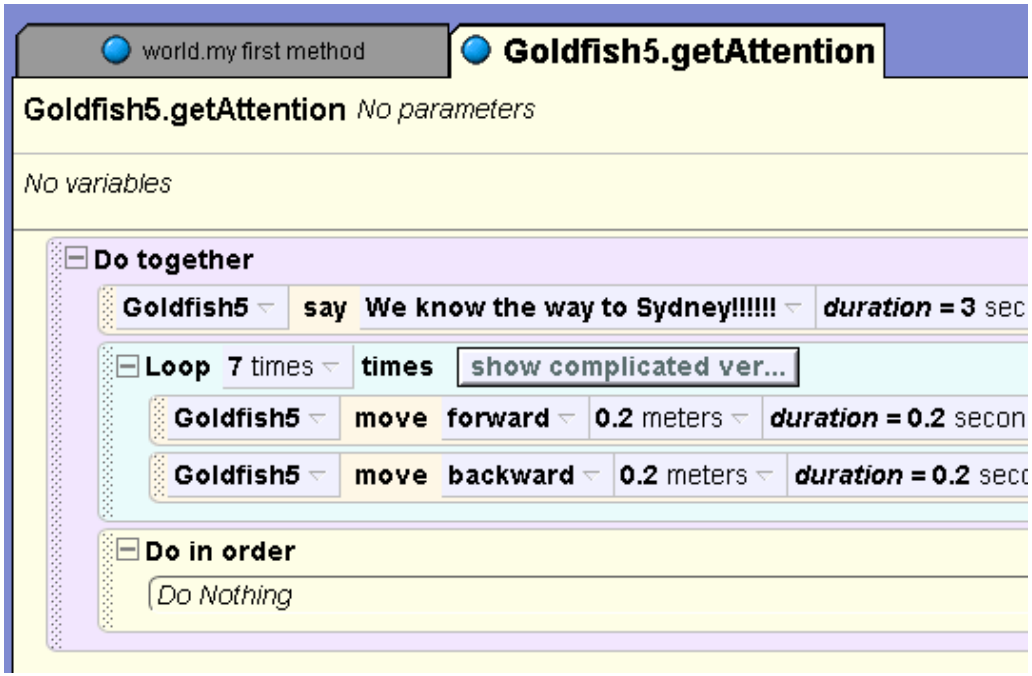
Affecting Subparts

- Most objects have subparts
- The goldfish has a tail and right and left fins
- subparts can be given commands just like the whole object
- Add a ***Do in order*** block to the inside of the do together block in get attenetion



Affecting subparts

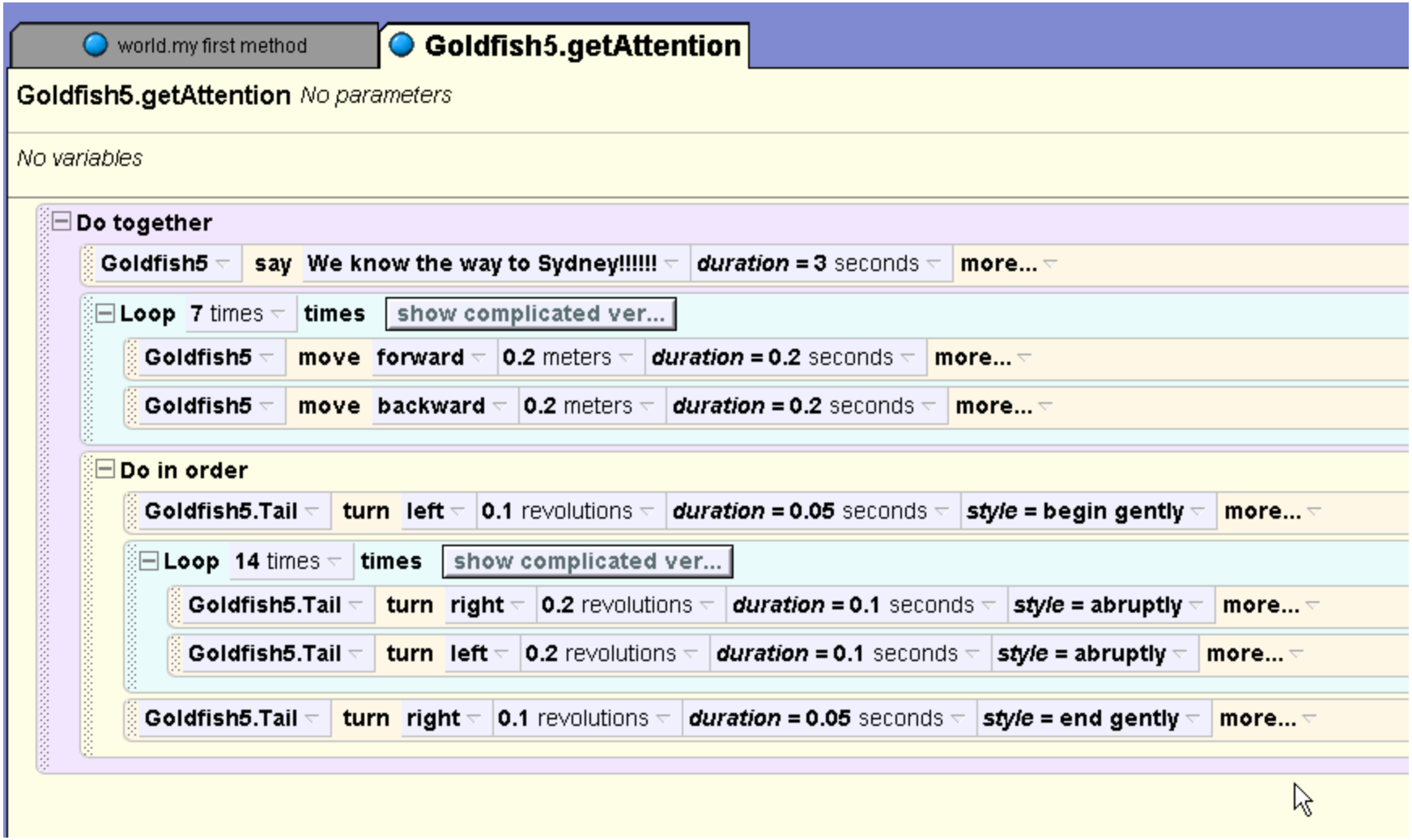
- In the object tree select the lead goldfish's tail



Moving the Tail

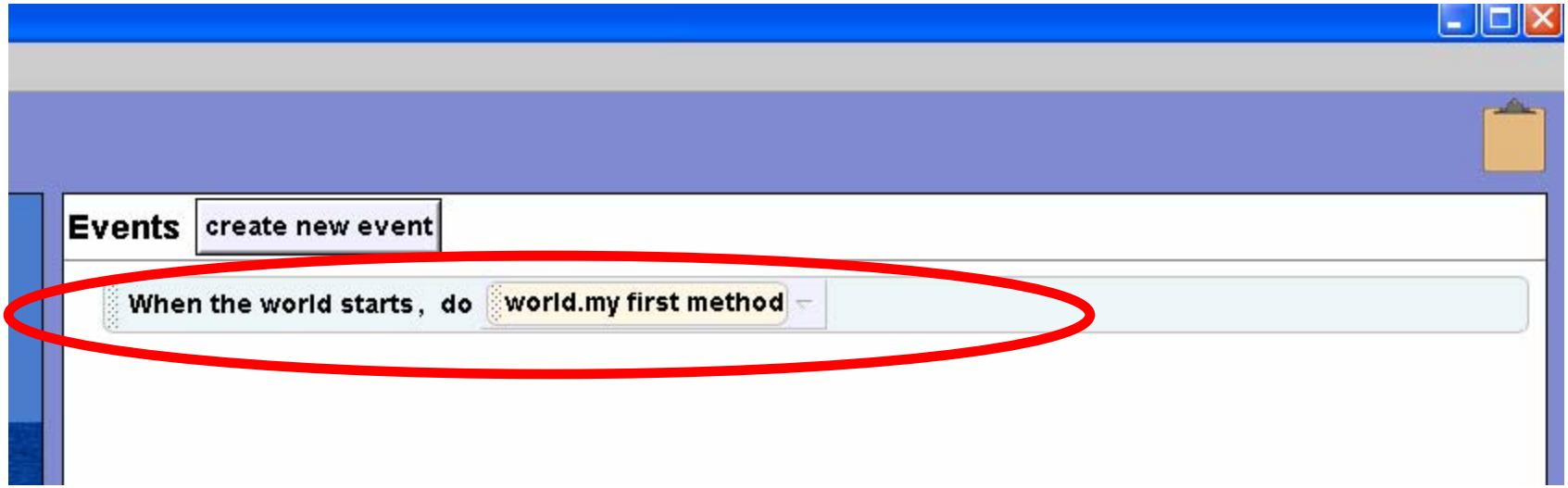
- Add commands in the do together to move the ***turn*** the tail left .1 revolutions
- Then a loop to move right and left .2
- Then right .1
- Make durations .1 seconds
- To make more realistic change style to ***abruptly***

Completed *get attention* Method



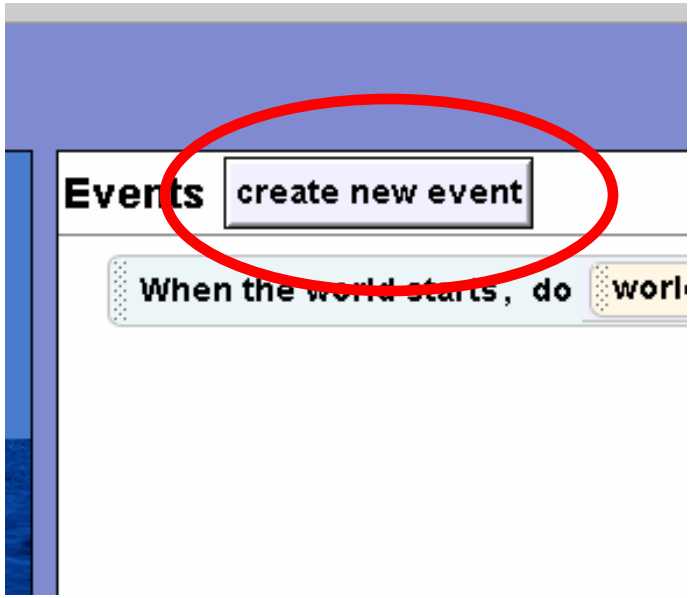
Events

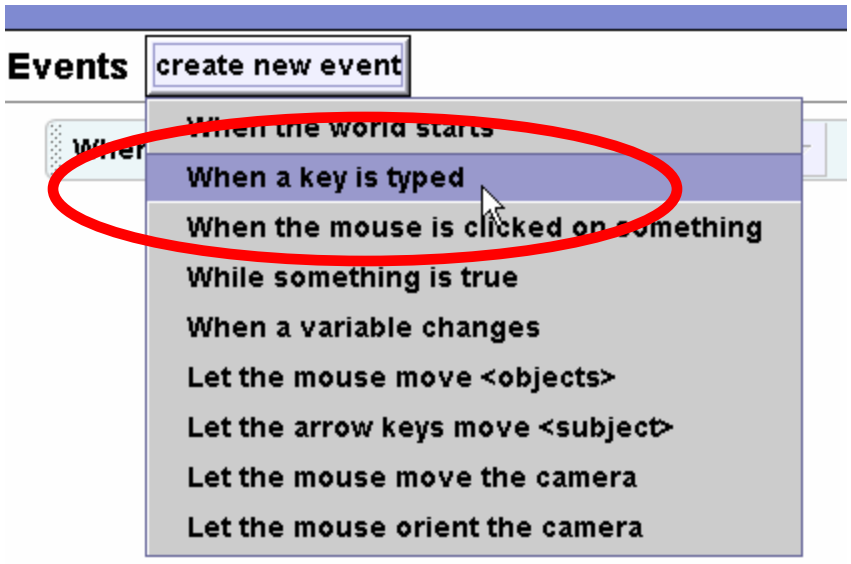
- Events are parts of the program that can respond to user input
- Initially only event is when world starts do the my first method method



Add an Event

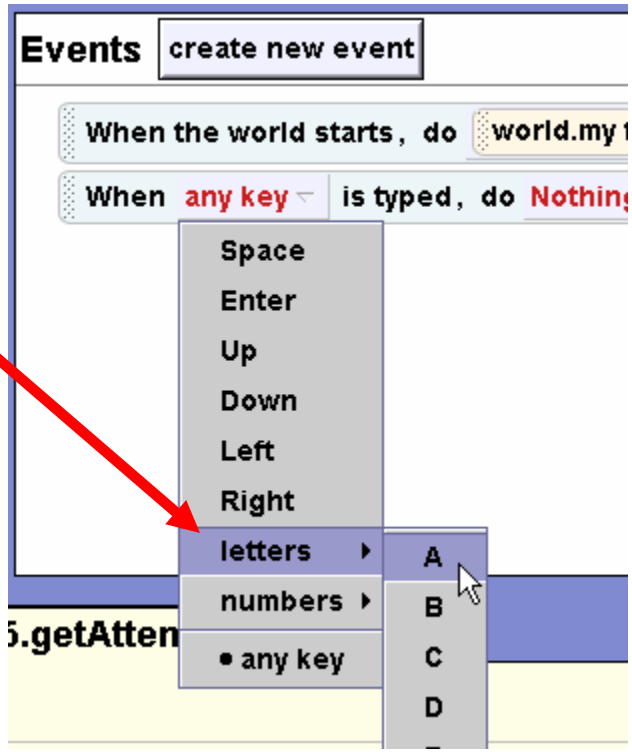
- Click the ***create new event*** button
- From the pop up menu select when a key is typed





Change Event

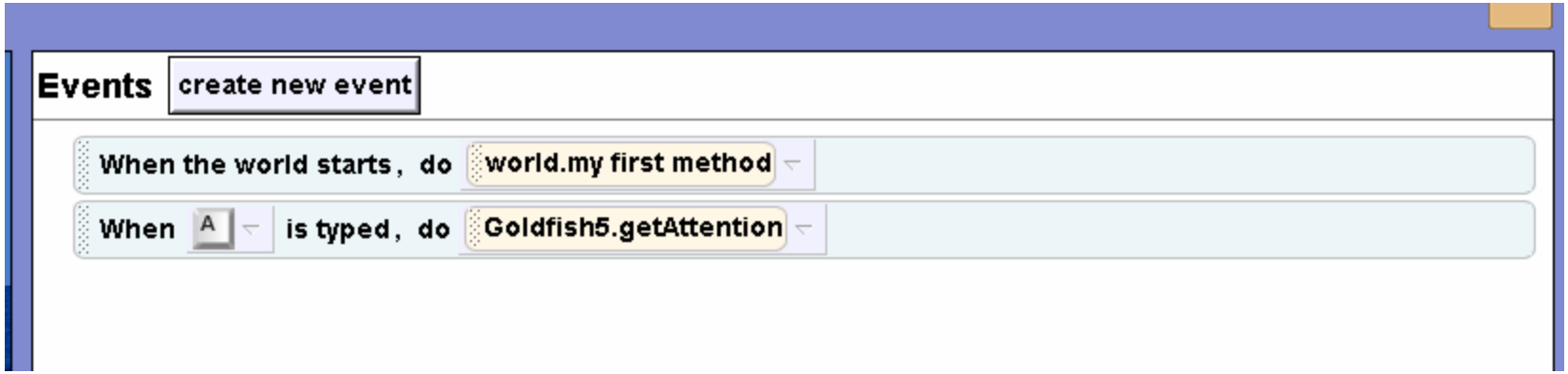
- Result of creating new event show
- Use drop down menu to change any key to letter A



Change Event Handler

- Select goldfish with ***get attention*** method
- Drag the ***get attention*** method to replace the ***nothing*** in the event
- Dragging and dropping can be used to replace many thing in Alice. Green means it is okay to replace!

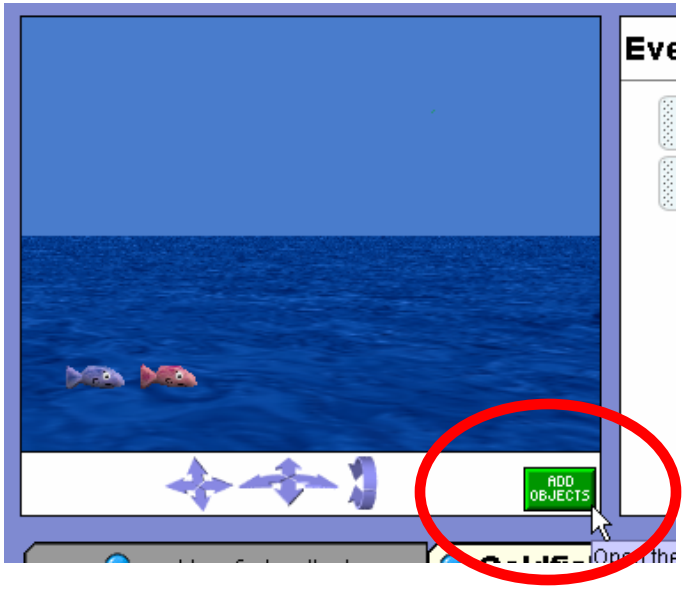
Finished Event

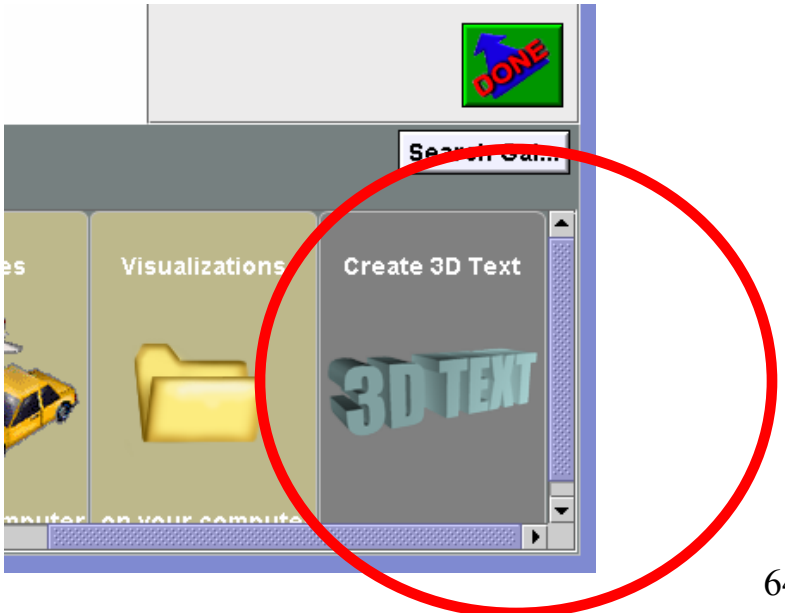


- Now, whenever program is playing and *A* key is pressed ***get attention*** will be carried out!
- Play and wait until movie plays out then try the event

Add 3D Text

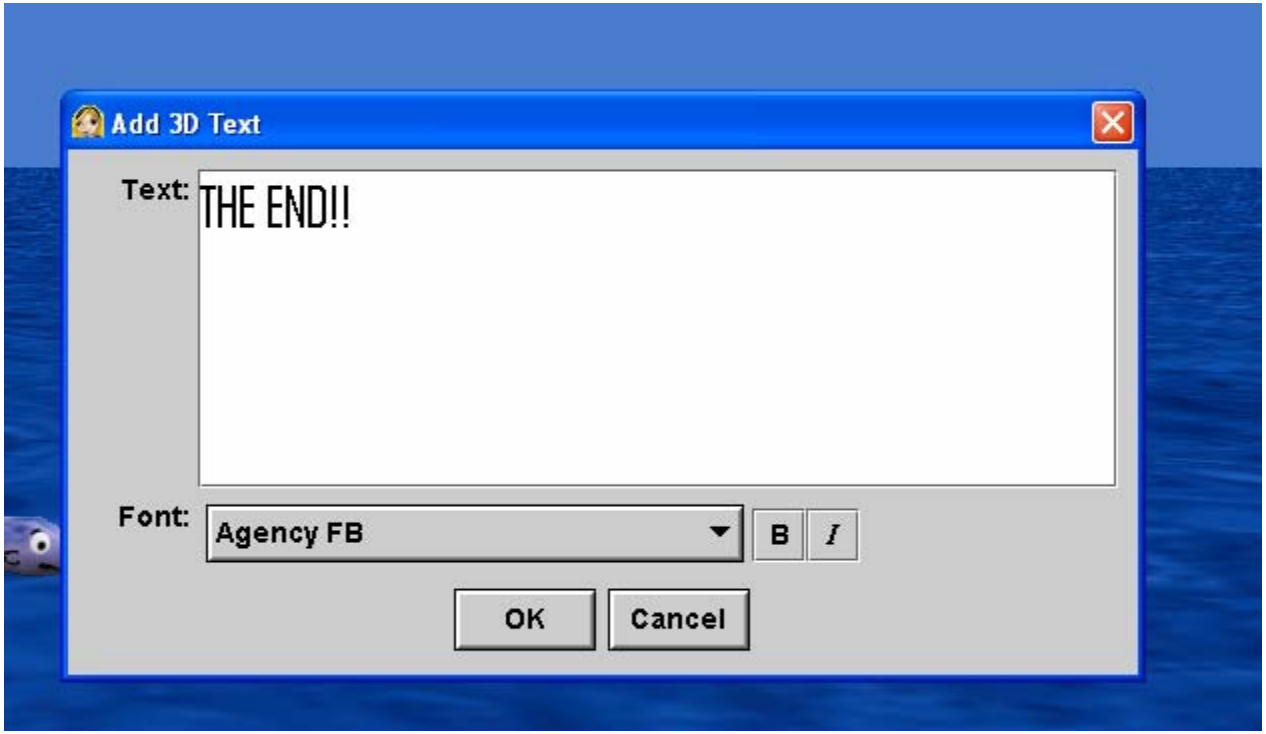
- Go to the add objects screen
- Go to end of objects gallery to the add 3d text folder and click on it





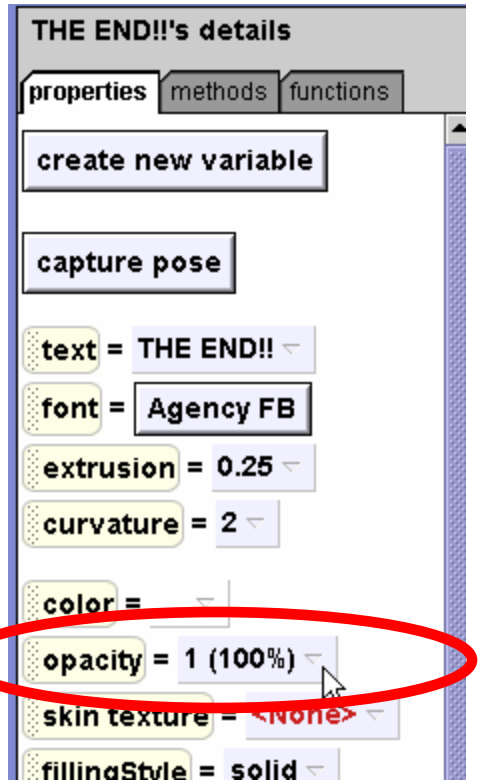
Add 3d Text

- Type in message to show at end of movie and press okay
- Rotate 3d text so it faces camera



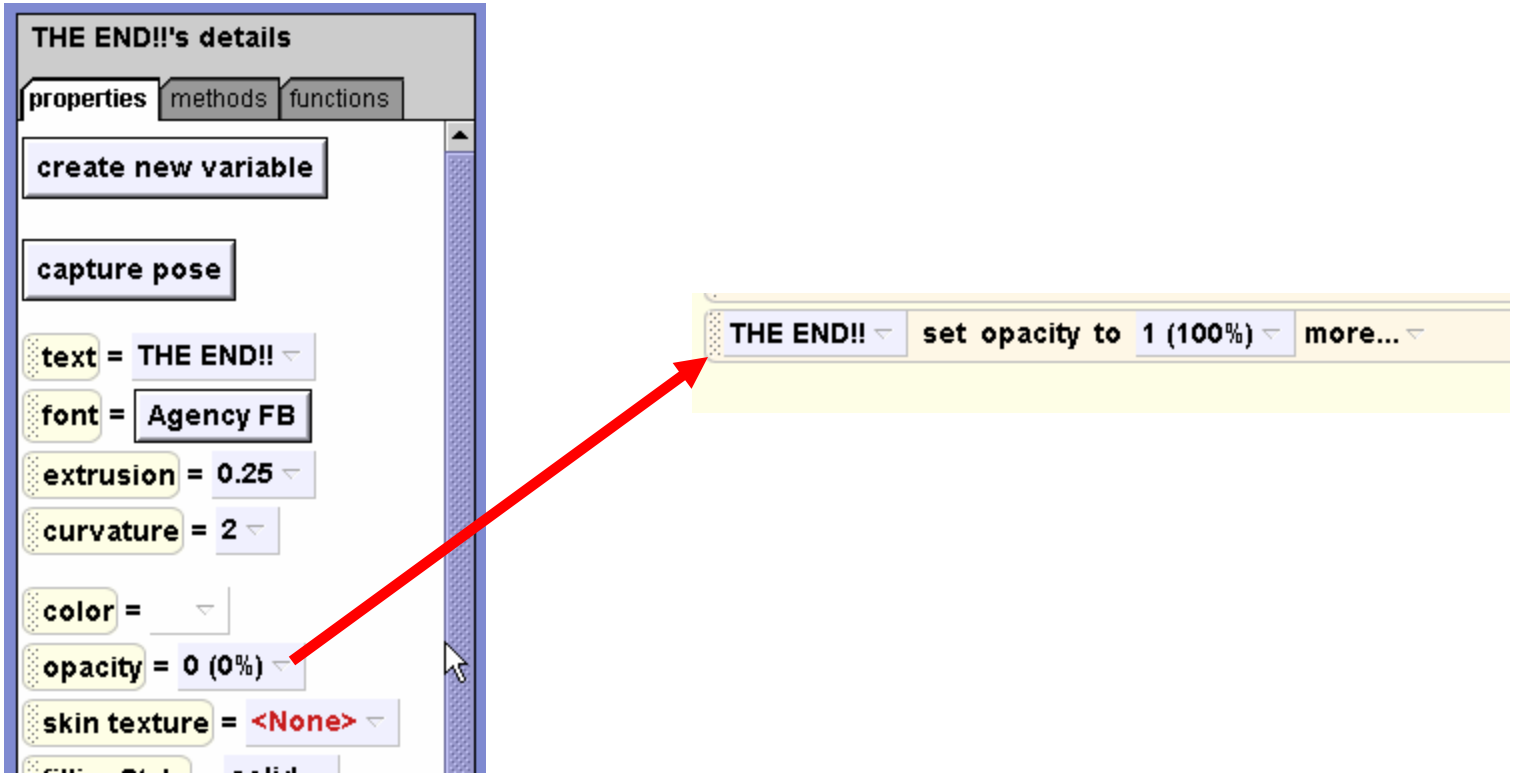
Make 3d Text Invisible

- Go back to programming screen
- Change property of 3d text to make its opacity 0. (Don't drag into program just change it)



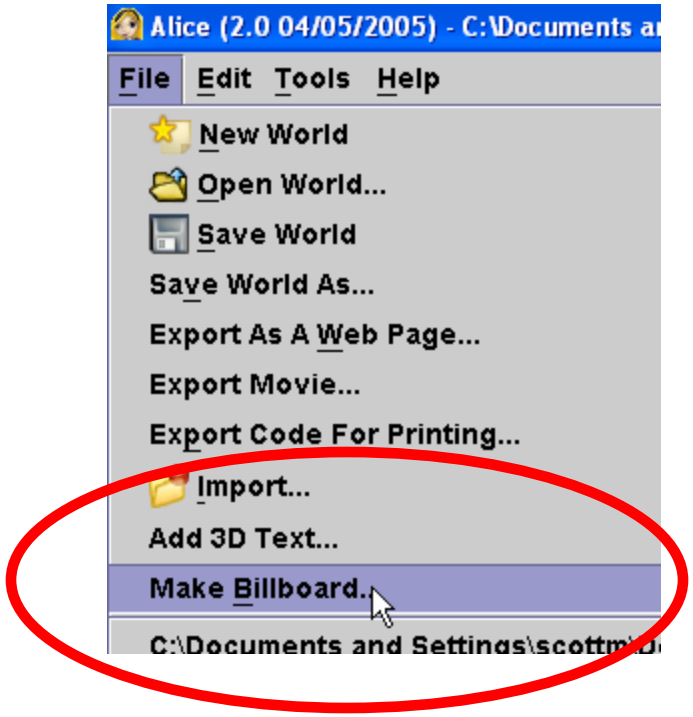
Make 3d Text Visible

- Next drag opacity property into end of my first method to change to 100%
- Play!!!



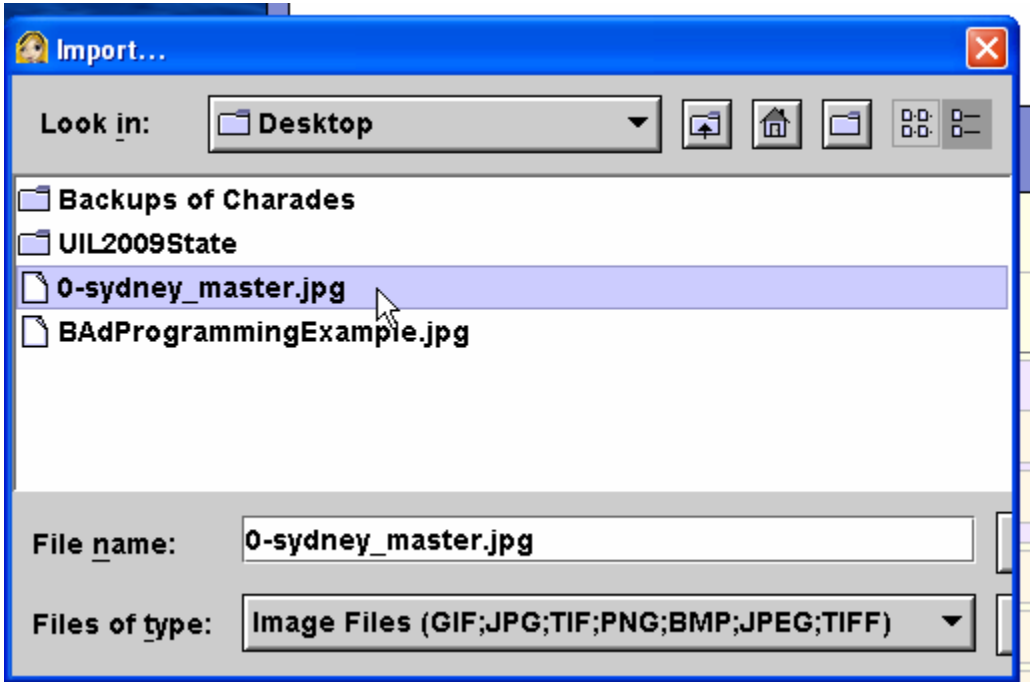
Add a Billboard

- Download an image of the city of Sydney from the web and store it on your computer
- From the File option in the menu select Make Billboard



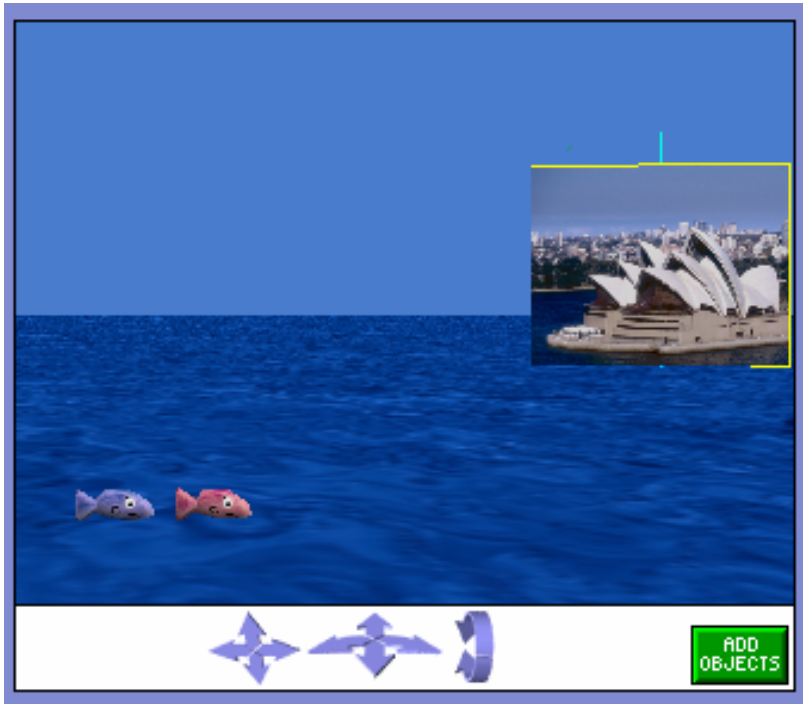
Add a Billboard

- Browse to the location of you image and select it.
- Once added the billboard can be moved, resized, given commands, and have its properties altered just like other objects



Swim to Sydney

- Move Sydney billboard to background
- Change opacity to 0
- Add commands for Dory and Marlin to guess and goldfish to direct them to Sydney
- Have Sydney appear and fish swim towards it



Add Sound

- Add sound to ***world***
- Select world in object tree
- Select ***properties*** tab
- click import sound button (wav or mp3)
- drag sound into program to play