Teaching Characters to Walk: Learning Methods, Part 1

By Deborah Nelson

Duke University

Under the direction of

Professor Susan Rodger

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Overview

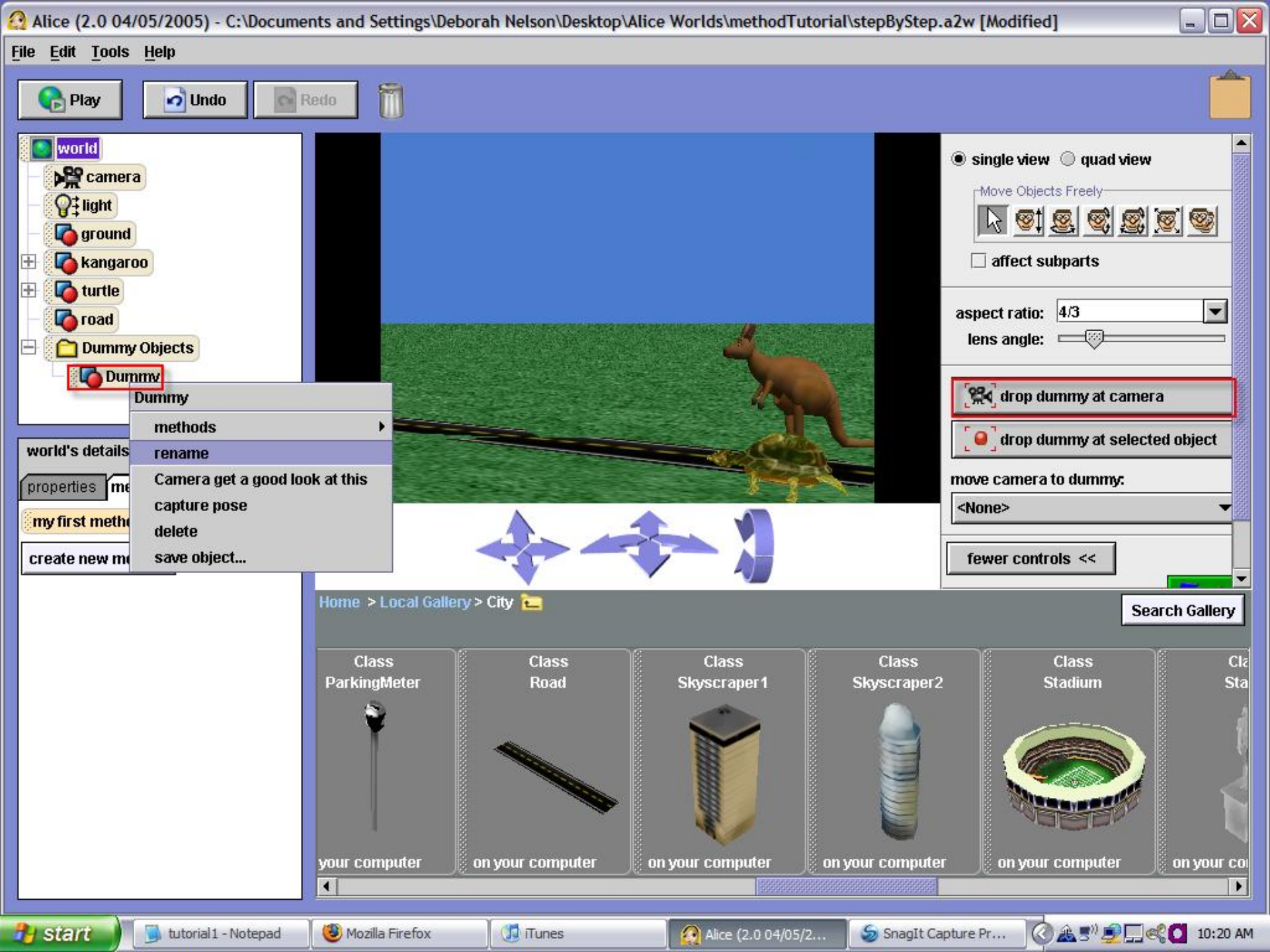
- This tutorial will teach you how to make class-level and world-level methods.
- It will do this by showing you how to make a turtle walk, and a kangaroo hop, so that they are racing each other. You will also learn how to use loops.
- By learning this, you will be able to go on to create your own world and class-level methods.

Loading the World

- Open Alice. Then open the file methodStart.a2w from the Student Classwork drive (mcmillan/ALICE)
- Save it to your documents.
- NOTE: You cannot double-click the file to open.
- Windows will not know what to use, and even if you select Alice from a list of programs, the loading will fail.

Loading (cont 1)

- First: After you have opened the file, and set up your world, go into the "Layout" mode by clicking on the green button Add Objects (toward the middle of screen).
- Click more controls. Click drop a dummy at the camera. Rename the dummy originalPosition. To leave the layout mode, click done.
- Look at the screenshot on the next page for an illustration.


Alice (2.0 04/05/2005) - C:\Documents and Settings\Deborah Nelson\Desktop\Alice Worlds\methodTutorial\stepByStep.a2w [Modified]
File Edit Tools Help
Play
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turtle
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Dummy Objects
Dummy
Dummy
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Camera get a good look at this
capture pose
delete
save object...
world's details
properties
my first meth
create new m
single view
quad view
Move Objects Freely
affect subparts
aspect ratio:
4/3
lens angle:
drop dummy at camera
drop dummy at selected object
move camera to dummy:
<None>
fewer controls <<
Home > Local Gallery > City
Search Gallery
Class ParkingMeter
Class Road
Class Skyscraper1
Class Skyscraper2
Class Stadium
your computer
on your computer
on your computer
on your computer
on your computer
start
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Why drop a dummy?

- This is something you should always do when you make a world in case you need to return the camera to this view later.
- If you don't understand dummys, look at the camera control tutorial again.

Part 1: Methods

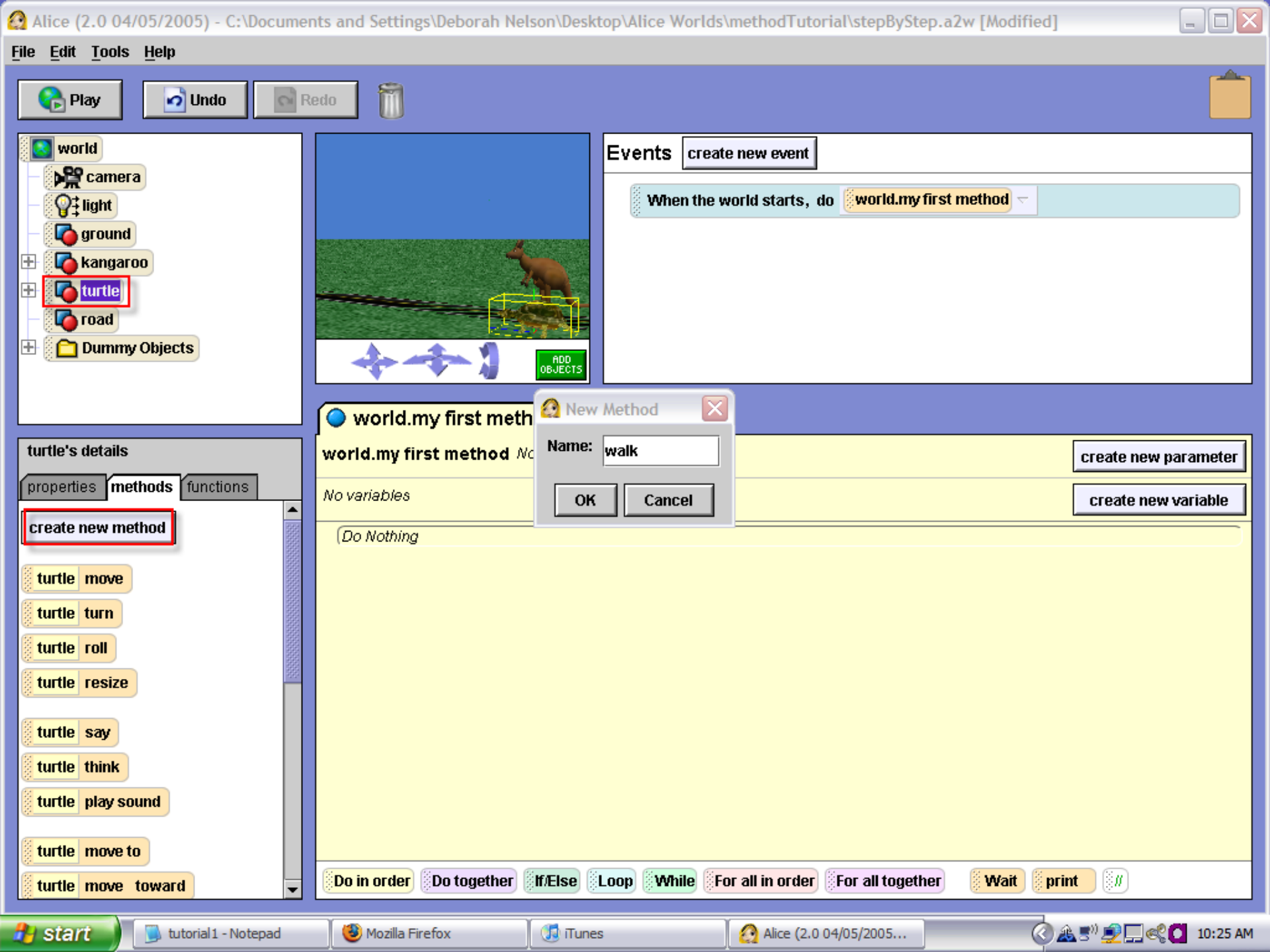
- A method is a sequence of instructions or behaviors that will be carried out when requested.
- Remember, built in methods are basic instructions every character already knows how to perform.
- You can use them to create new methods so that the characters can do more.
- The two types of methods are class-level and world-level.

Part 2: Class-level methods

- A class-level method defines the behavior for a single character.
- **Step 1:*How to create a class-level method***

1) In our example world, click on the turtle in the object tree (upper left panel).
2) In turtle's details (lower left panel) click the methods tab and then the button create new method. Name it walk.

- See the screenshot on the next slide for an illustration.


Alice (2.0 04/05/2005) - C:\Documents and Settings\Deborah Nelson\Desktop\Alice Worlds\methodTutorial\stepByStep.a2w [Modified]
File Edit Tools Help
Play
Undo
Redo
world
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light
ground
kangaroo
turtle
road
Dummy Objects
ADD OBJECTS
Events
create new event
When the world starts, do
world.my first method
world.my first meth
New Method
Name:
walk
OK
Cancel
world.my first method
create new parameter
No variables
create new variable
Do Nothing
turtle's details
properties
methods
functions
create new method
turtle move
turtle turn
turtle roll
turtle resize
turtle say
turtle think
turtle play sound
turtle move to
turtle move toward
Do in order
Do together
If/Else
Loop
While
For all in order
For all together
Wait
print
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start
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Step 2: *How to write a method*

- We want to move the turtle's legs back and forth as the turtle moves forward.
- First, drag the control statement Do in order, from the bottom of the window, into the editor.
- This is the default setting for Alice, meaning that the instructions will be carried out in order, one after the other.
- See the screenshot on the next slide for an illustration.

Alice (2.0 04/05/2005) - C:\Documents and Settings\Deborah Nelson\Desktop\Alice Worlds\methodTutorial\stepByStep.a2w [Modified]

File Edit Tools Help

Play | Undo | Redo

world
- camera
- light
- ground
- kangaroo
- turtle
- road
- Dummy Objects

ADD OBJECTS

Events | create new event

When the world starts, do | world.my first method

world.my first method | turtle.walk

turtle.walk *No parameters* | create new parameter

No variables | create new variable

Do Nothing

Do in order

turtle's details

properties | methods | functions

walk | edit

create new method

turtle move
turtle turn
turtle roll
turtle resize

turtle say
turtle think
turtle play sound

turtle move to

Do in order | Do together | If/Else | Loop | While | For all in order | For all together | Wait | print | //

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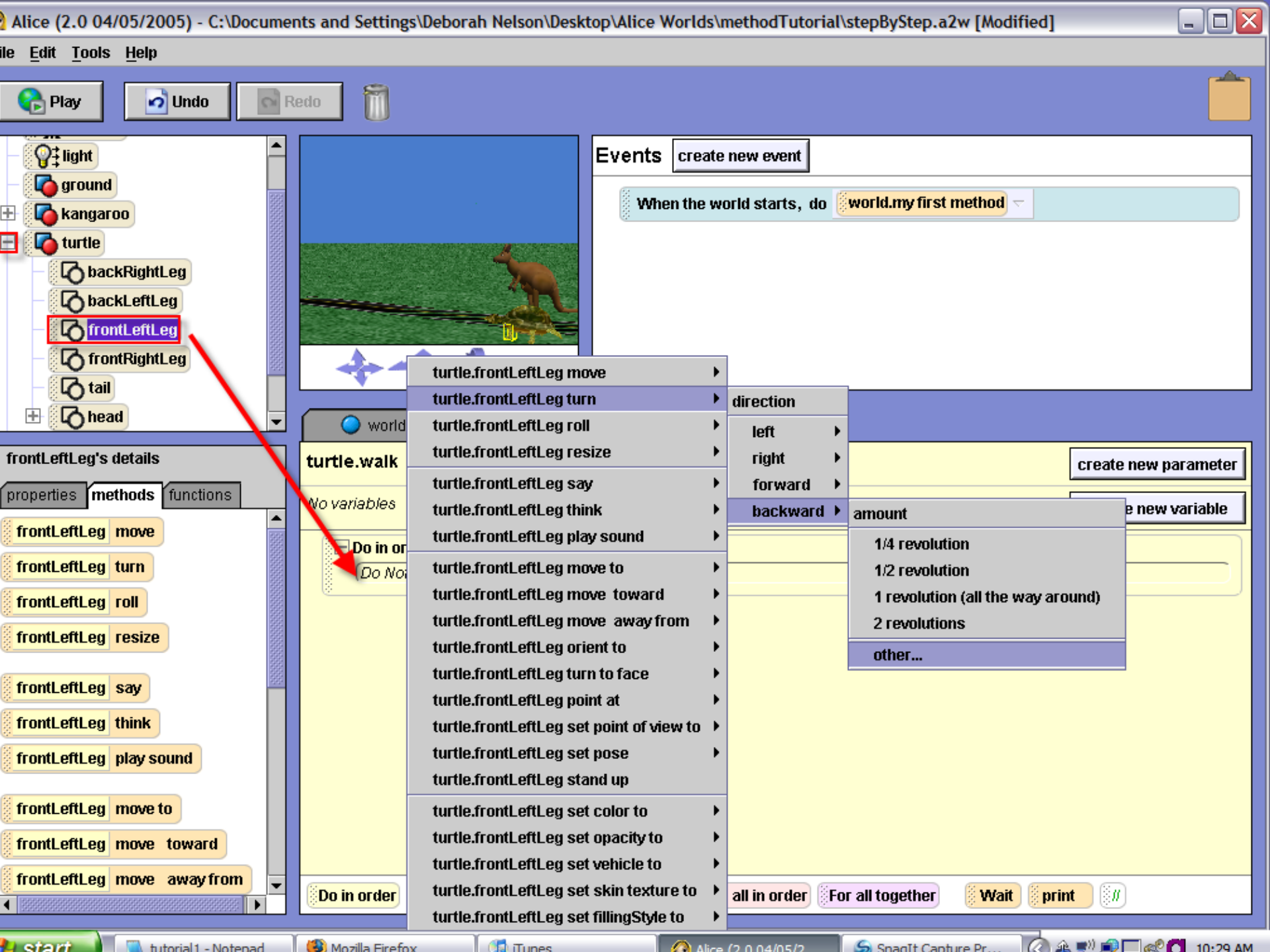
Writing a method (cont 1)

- Next, in the object tree, click on the + sign beside turtle to see the different body parts.
- Drag the frontLeftLeg into the method. Select turn, and then backward. Choose other and type in 0.1.
- See the screenshot on the next slide for an illustration.


Alice (2.0 04/05/2005) - C:\Documents and Settings\Deborah Nelson\Desktop\Alice Worlds\methodTutorial\stepByStep.a2w [Modified]
File Edit Tools Help
Play
Undo
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light
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kangaroo
turtle
backRightLeg
backLeftLeg
frontLeftLeg
frontRightLeg
tail
head
Events
create new event
When the world starts, do
world.my first method
frontLeftLeg's details
properties
methods
functions
frontLeftLeg move
frontLeftLeg turn
frontLeftLeg roll
frontLeftLeg resize
frontLeftLeg say
frontLeftLeg think
frontLeftLeg play sound
frontLeftLeg move to
frontLeftLeg move toward
frontLeftLeg move away from
turtle.walk
No variables
create new parameter
turtle.frontLeftLeg move
turtle.frontLeftLeg turn
turtle.frontLeftLeg roll
turtle.frontLeftLeg resize
turtle.frontLeftLeg say
turtle.frontLeftLeg think
turtle.frontLeftLeg play sound
turtle.frontLeftLeg move to
turtle.frontLeftLeg move toward
turtle.frontLeftLeg move away from
turtle.frontLeftLeg orient to
turtle.frontLeftLeg turn to face
turtle.frontLeftLeg point at
turtle.frontLeftLeg set point of view to
turtle.frontLeftLeg set pose
turtle.frontLeftLeg stand up
turtle.frontLeftLeg set color to
turtle.frontLeftLeg set opacity to
turtle.frontLeftLeg set vehicle to
turtle.frontLeftLeg set skin texture to
turtle.frontLeftLeg set fillingStyle to
direction
left
right
forward
backward
amount
1/4 revolution
1/2 revolution
1 revolution (all the way around)
2 revolutions
other...
Do in order
all in order
For all together
Wait
print
//

Writing a method (cont 2)

- Finally, click more at the end of the turn command and choose duration, then .25 seconds.
- The default time for an action to be performed is 1 second. We are changing it to 0.25 so that it will happen faster.
- Next, we want the turtle to move forward at the same time that the back leg goes forward.
- So drag in the *control statement* Do together
- See the screenshot on the next slide for an illustration.

Alice (2.0 04/05/2005) - C:\Documents and Settings\Deborah Nelson\Desktop\Alice Worlds\methodTutorial\stepByStep.a2w [Modified]

File Edit Tools Help

Play | Undo | Redo

light
ground
kangaroo
turtle
backRightLeg
backLeftLeg
frontLeftLeg
frontRightLeg
tail
head

ADD OBJECTS

Events | create new event

When the world starts, do world.my first method

frontLeftLeg's details

properties | methods | functions

frontLeftLeg move
frontLeftLeg turn
frontLeftLeg roll
frontLeftLeg resize
frontLeftLeg say
frontLeftLeg think
frontLeftLeg play sound
frontLeftLeg move to
frontLeftLeg move toward
frontLeftLeg move away from

world.my first method | turtle.walk

turtle.walk *No parameters* | create new parameter

No variables | create new variable

Do in order
turtle.frontLeftLeg turn backward 0.1 revolutions *duration* = 0.25 seconds more...
Do together
Do Nothing

Do in order | Do together | If/Else | Loop | While | For all in order | For all together | Wait | print | //

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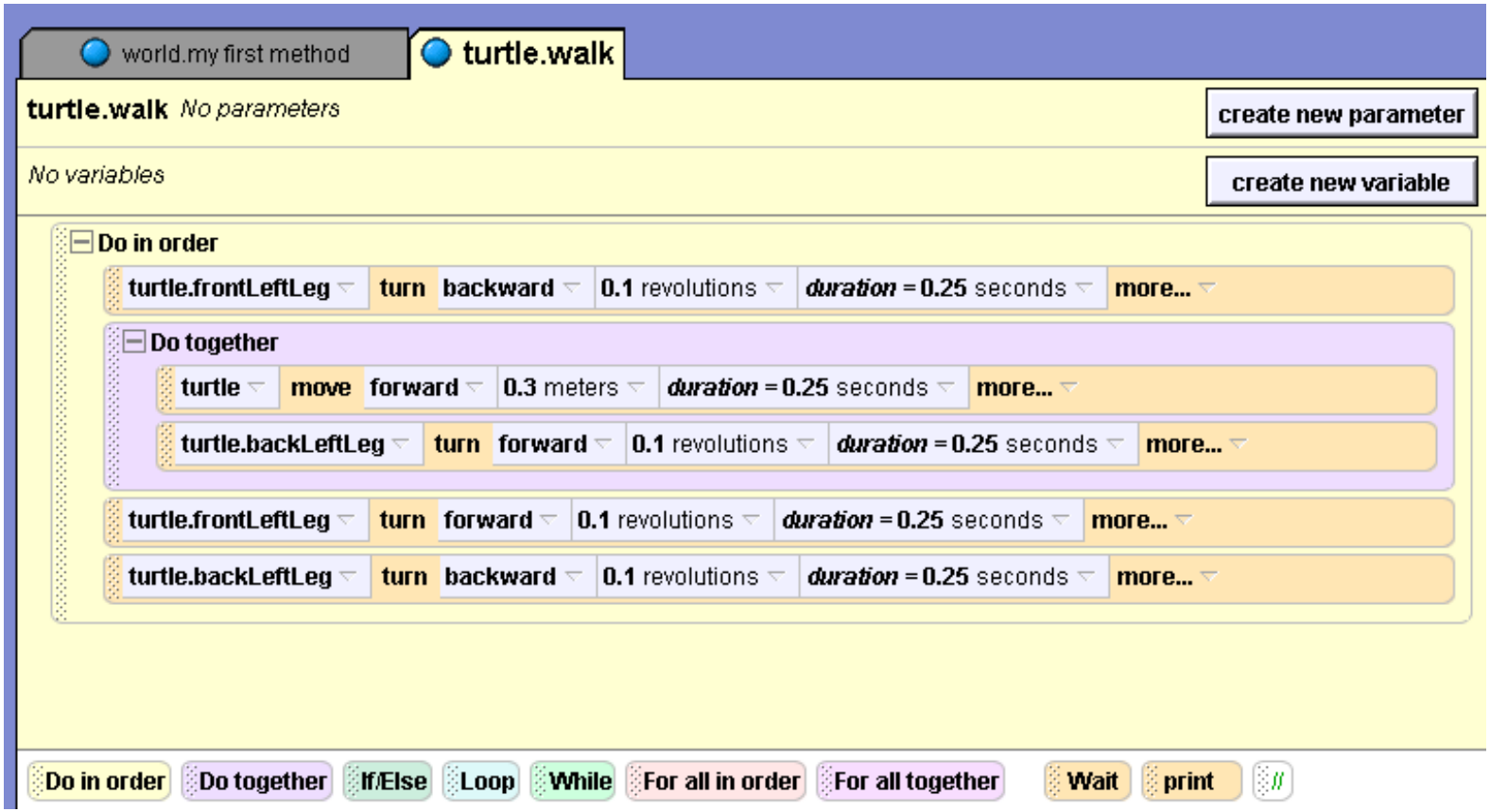
Writing a method (cont 3)

- Finish dragging and dropping the instructions until your method looks like this:



Writing a method (cont 4)

- Finally, add a comment to your method to tell someone reading your code what it does.
- Your comment can say: "Move the turtle's legs back and forth".
- This comment is not Alice code.
- It is simply an explanation for someone trying to understand your code. Alice ignores the comments when it plays your world.
- See the screenshot on the next slide for an illustration.

Alice (2.0 04/05/2005) - C:\Documents and Settings\Deborah Nelson\Desktop\Alice Worlds\methodTutorial\stepByStep.a2w

File Edit Tools Help

Play | Undo | Redo

light
ground
kangaroo
turtle
backRightLeg
backLeftLeg
frontLeftLeg
frontRightLeg
tail
head

ADD OBJECTS

Events create new event

When the world starts, do world.my first method

world.my first method | turtle.walk

turtle's details

properties | methods | functions

walk edit

create new method

turtle move
turtle turn
turtle roll
turtle resize

turtle say
turtle think
turtle play sound

turtle move to

turtle.walk *No parameters*

create new parameter

No variables

create new variable

//

Do in order

turtle.frontLeftLeg turn backward 0.1 revolutions *duration* = 0.25 seconds more...

Do together

turtle move forward 0.3 meters *duration* = 0.25 seconds more...

turtle.backLeftLeg turn forward 0.1 revolutions *duration* = 0.25 seconds more...

turtle.frontLeftLeg turn forward 0.1 revolutions *duration* = 0.25 seconds more...

turtle.backLeftLeg turn backward 0.1 revolutions *duration* = 0.25 seconds more...

Do in order | Do together | If/Else | Loop | While | For all in order | For all together | Wait | print | //

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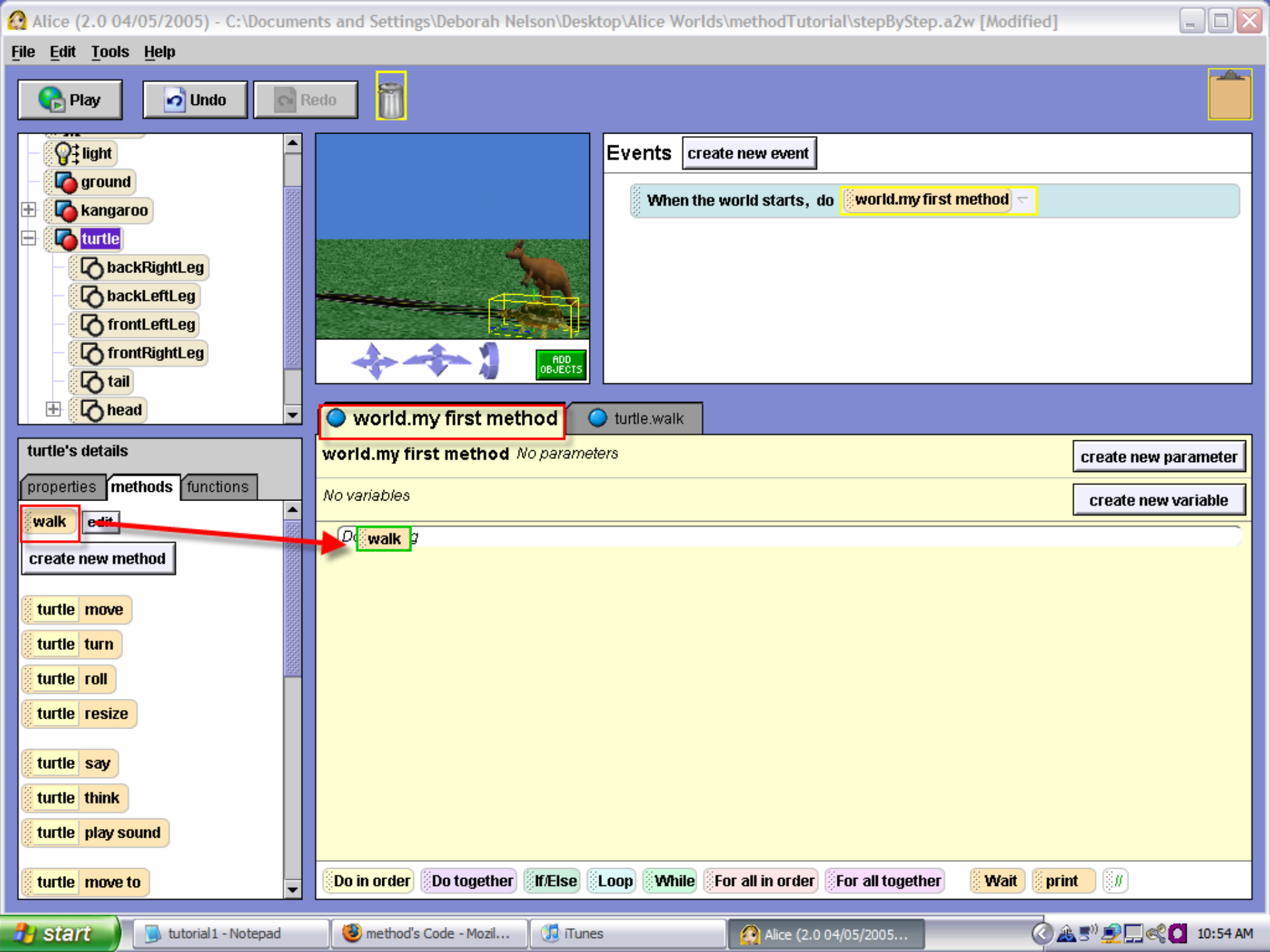
Step 3: ***To call your method***

- Click on world.myfirstmethod to get back to it and then drag turtle.walk into it.
- Push the play button to watch the turtle walk.
- See the screenshot on the next slide for an illustration.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backRightLeg
backLeftLeg
frontLeftLeg
frontRightLeg
tail
head
ADD OBJECTS
Events
create new event
When the world starts, do world.my first method
world.my first method
turtle.walk
turtle's details
properties
methods
functions
walk
edit
create new method
world.my first method No parameters
create new parameter
No variables
create new variable
Do walk
turtle move
turtle turn
turtle roll
turtle resize
turtle say
turtle think
turtle play sound
turtle move to
Do in order
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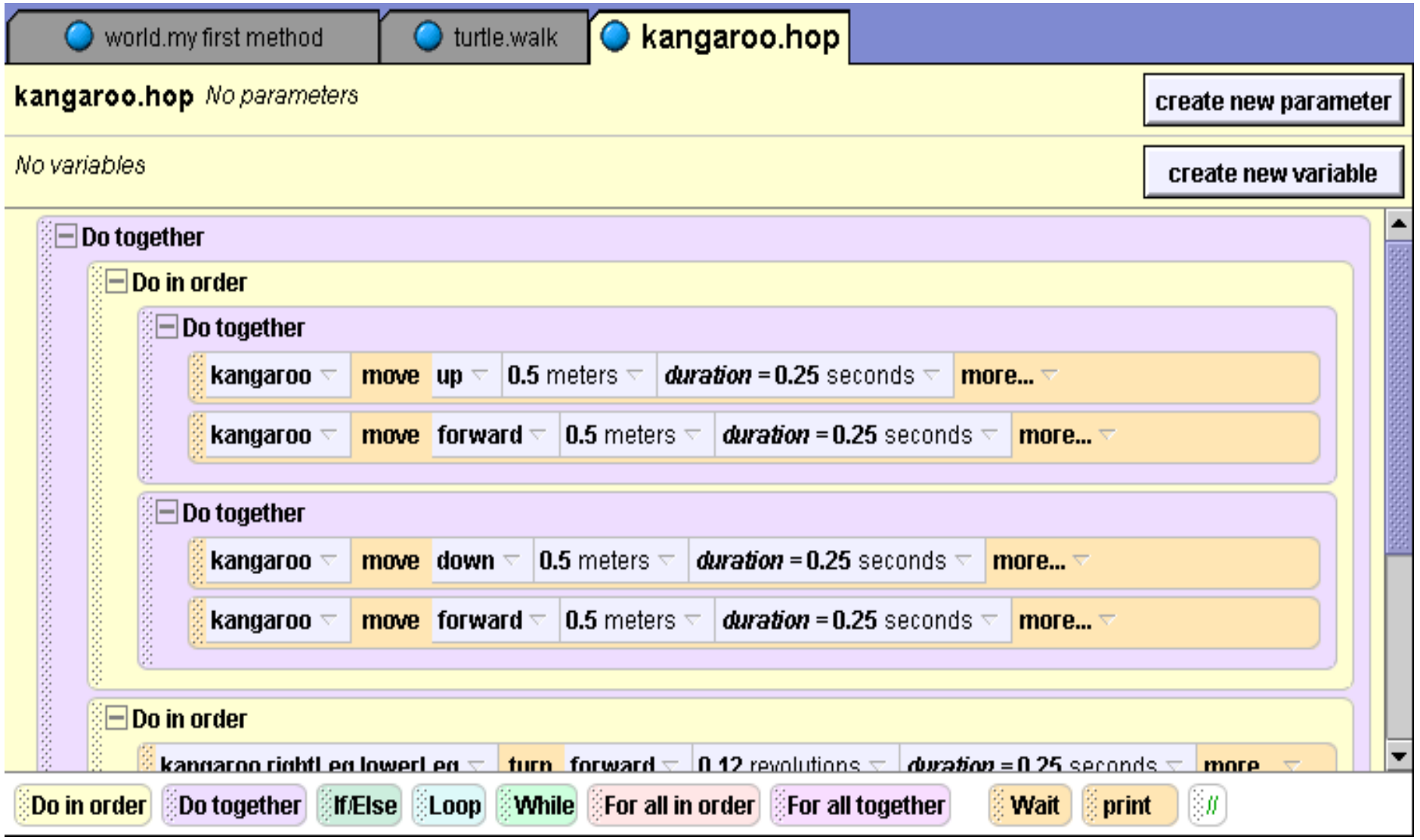
Step 4: *Writing a method for Kangaroo*

- Now we will write a class-level method for the kangaroo to make it hop.
- In the object tree, click on kangaroo. In kangaroo's details, click the button create new method and name it hop.
- To write the method, drag and drop the instructions listed on the following slides.

Kangaroo.hop method (cont 1)

- Your first step is to drag a Do together into the method.
- To find the lowerleg of the kangaroo, you click the + sign beside the leg tab. When you finish, your method should look like the screenshot on the next slide.

Part One of code for kangaroo.hop



Part two of code for kangaroo.hop

Kangaroo.hop method (cont 2)

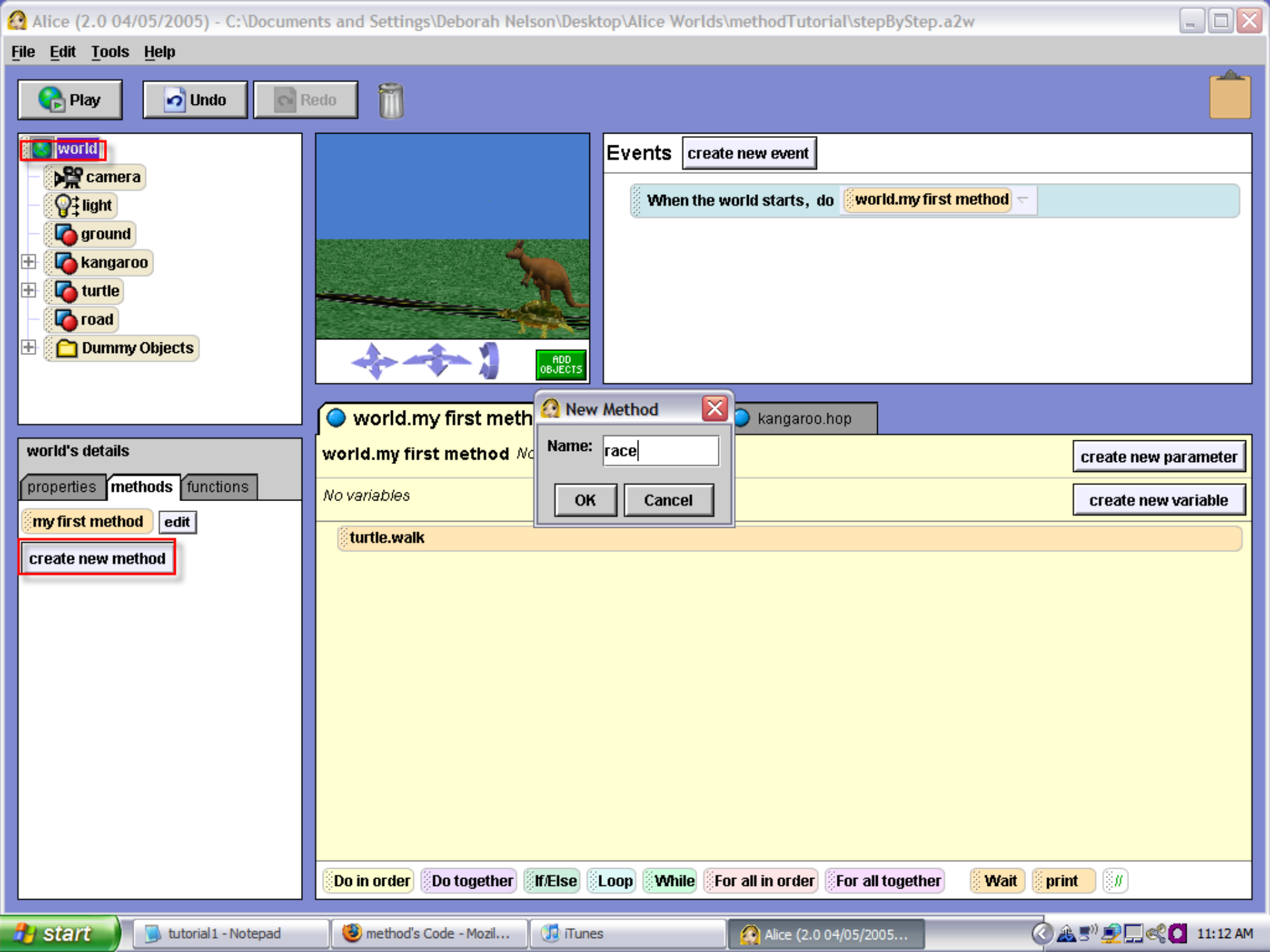
- Remember to call your method to test it.
- Click on world.myfirstmethod to get back to it and then delete what you have there.
- Drag kangaroo.hop into it.
- Push the play button to watch the kangaroo hop.

Part 3: World-level methods

- A world-level method has characters that interact with each other.
- If you need to write a method that references more than one object, use a world-level method.

Step 5: *Writing a world-level method*

- In our example, we are going to write a method so that the turtle and the kangaroo race each other.
- Click on world in the object tree. Click on the methods tab and the button create new method. Name it race.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File Edit Tools Help
Play
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world
camera
light
ground
kangaroo
turtle
road
Dummy Objects
ADD OBJECTS
Events
create new event
When the world starts, do
world.my first method
world's details
properties
methods
functions
my first method
edit
create new method
world.my first meth
kangaroo.hop
world.my first method
create new parameter
No variables
create new variable
turtle.walk
New Method
Name:
race
OK
Cancel
Do in order
Do together
If/Else
Loop
While
For all in order
For all together
Wait
print
//
start
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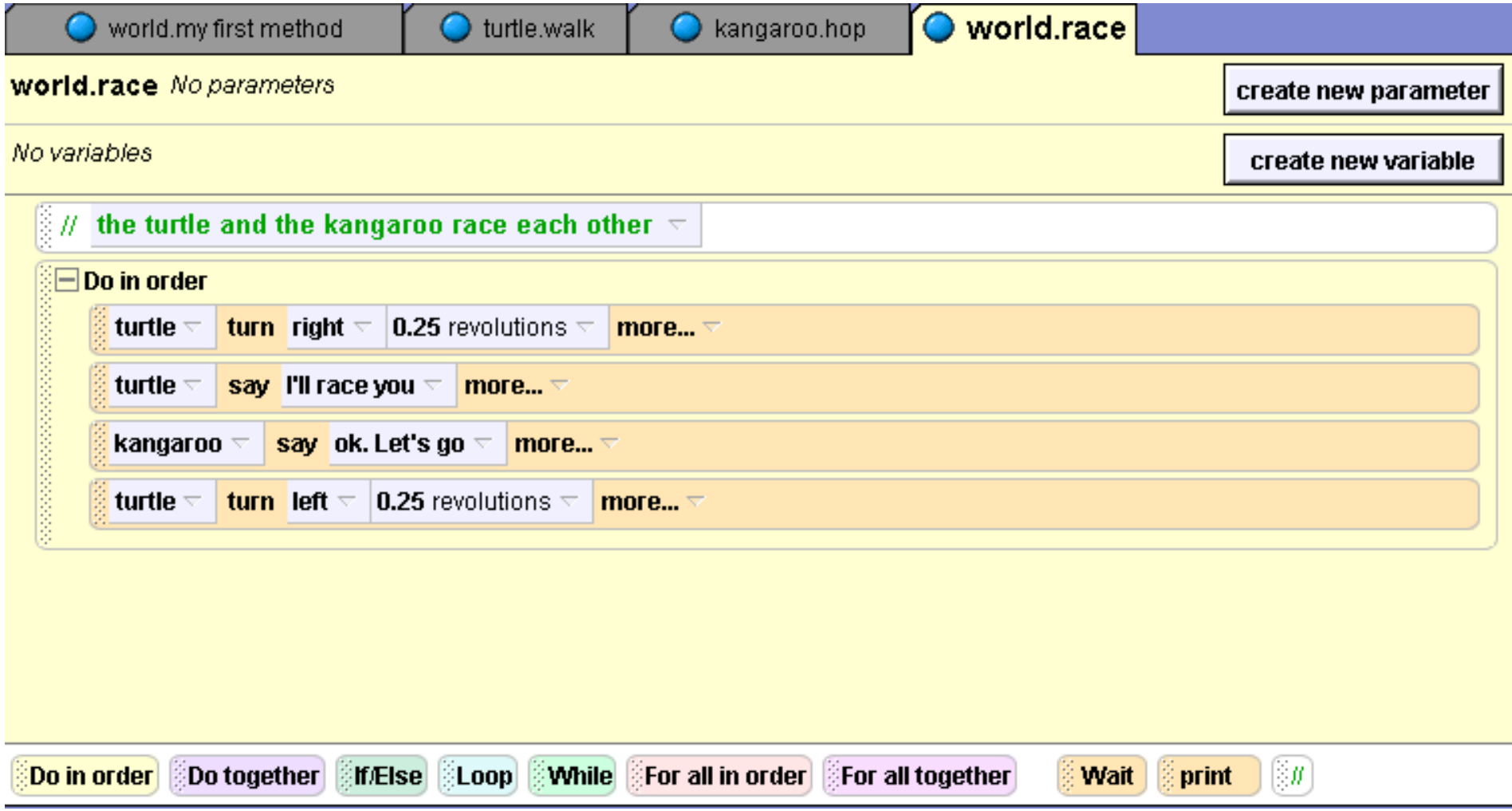
Writing a world-level method (cont 1)

- First, we want the turtle to have a conversation with the kangaroo.
- The first step is to drag a Do in order into the method.
- Then, click on turtle in the object tree and drag it into the method.
- Put the following code on the next slide into this method:

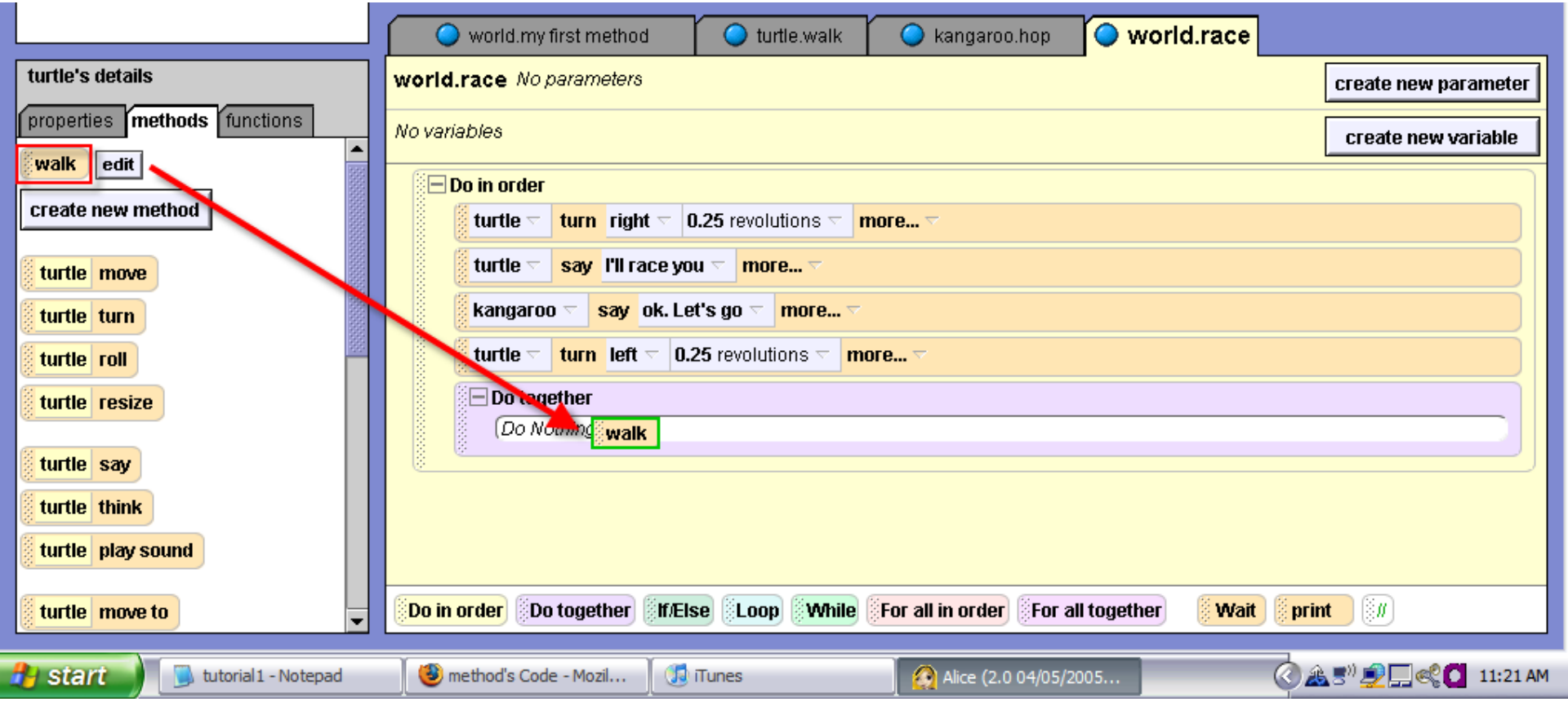
The code for world.race



Writing a world-level method (cont 2)

- Since we want the turtle and the kangaroo to move together, drag the control statement Do together into the race method.
- Click on turtle in the object area and click on the methods tab.

- Then drag turtle.walk into the Do together.



Writing a world level method (cont 3)

- Click on kangaroo in the object tree.
- Drag kangaroo.hop into the Do together under turtle.walk.
- Click on world.myFirstMethod. Delete what you have there.

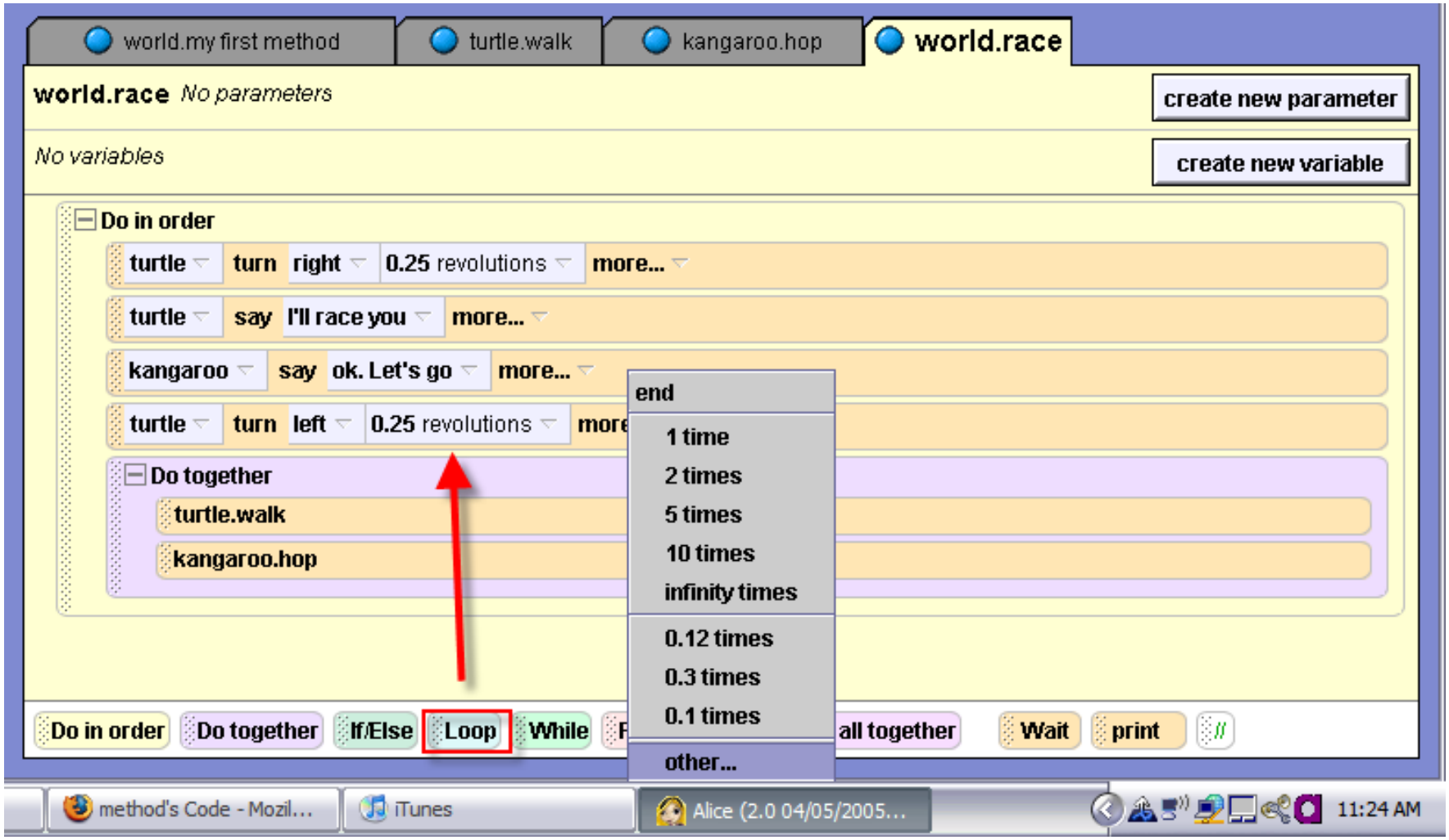
Play your world

- Click on world in the object area and drag world.race into myFirstMethod. Push play.
- The characters will only move once, which doesn’t look like much of a race.
- If we repeatedly call the hop and walk methods in world.race, it will look more like a race.
- Instead of dragging the instructions over multiple times, let's use a loop.

Step 6: *Loops*

- One of the control statements is Loop.
- A Loop will call the method that you drop in it as many times as you ask it to.
- Drag Loop from the bottom of the window into the world.race method right above the Do together. Select other and type in 4. This means the loop will call whatever you put in it 4 times.
- See the screenshot on the next slide for an illustration

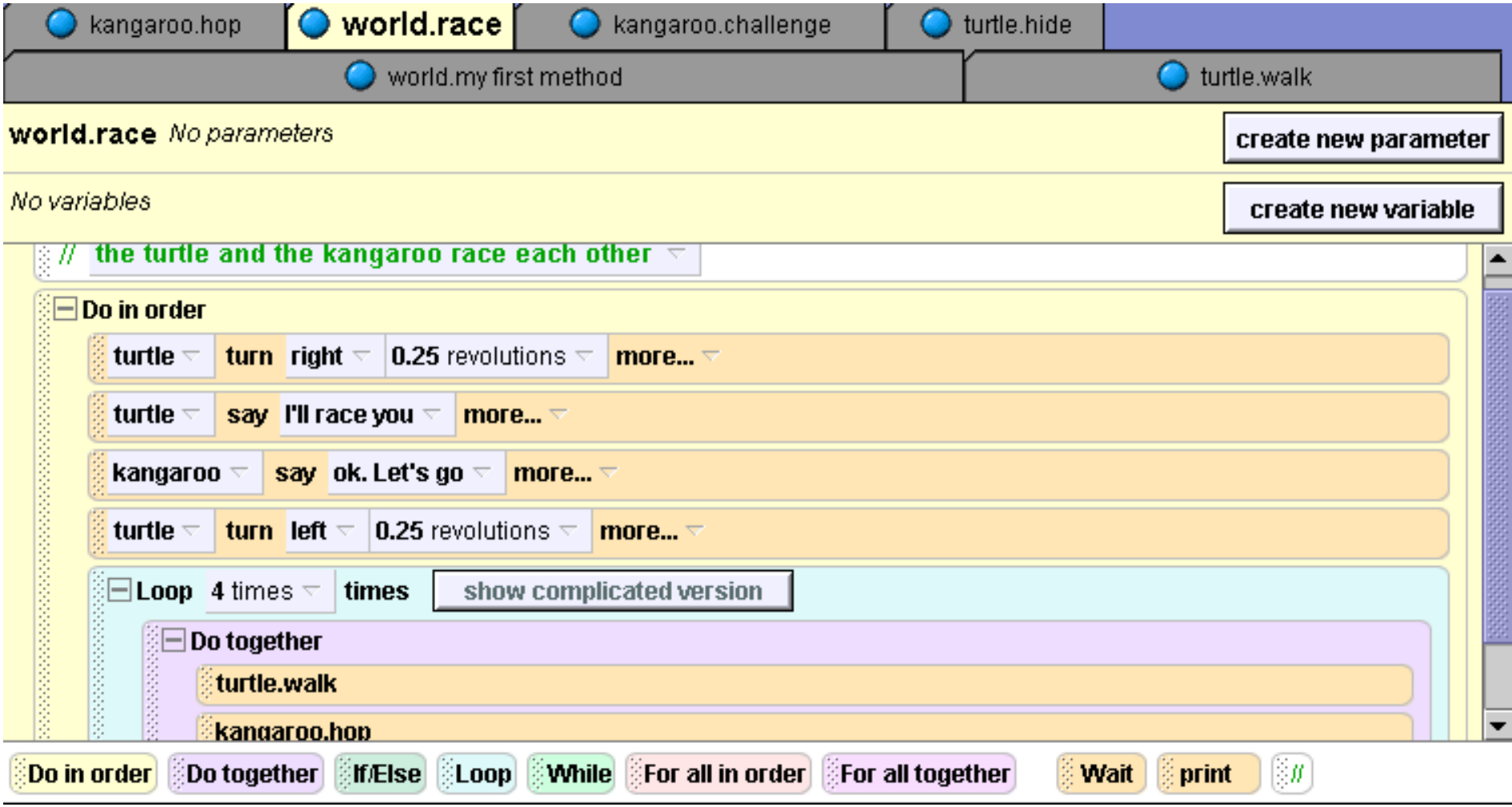
Dragging the loop into your code



Making the loop

- Drag the Do together statement (with kangaroo.hop and turtle.walk) into the Loop statement.
- Your code should look like this now (see next slide).

The completed code for world.race



Play your world

- When you push play, the kangaroo will win the race.
- Congratulations on creating one of your first methods. Save this world. We will add to it again in a later tutorial.

Recap

- This tutorial introduced class-level and world-level methods.
- If there is only one character in a method, it should be a class-level method.
- If there is more than one character involved, write a world-level method.
- To repeat an action, use a loop.