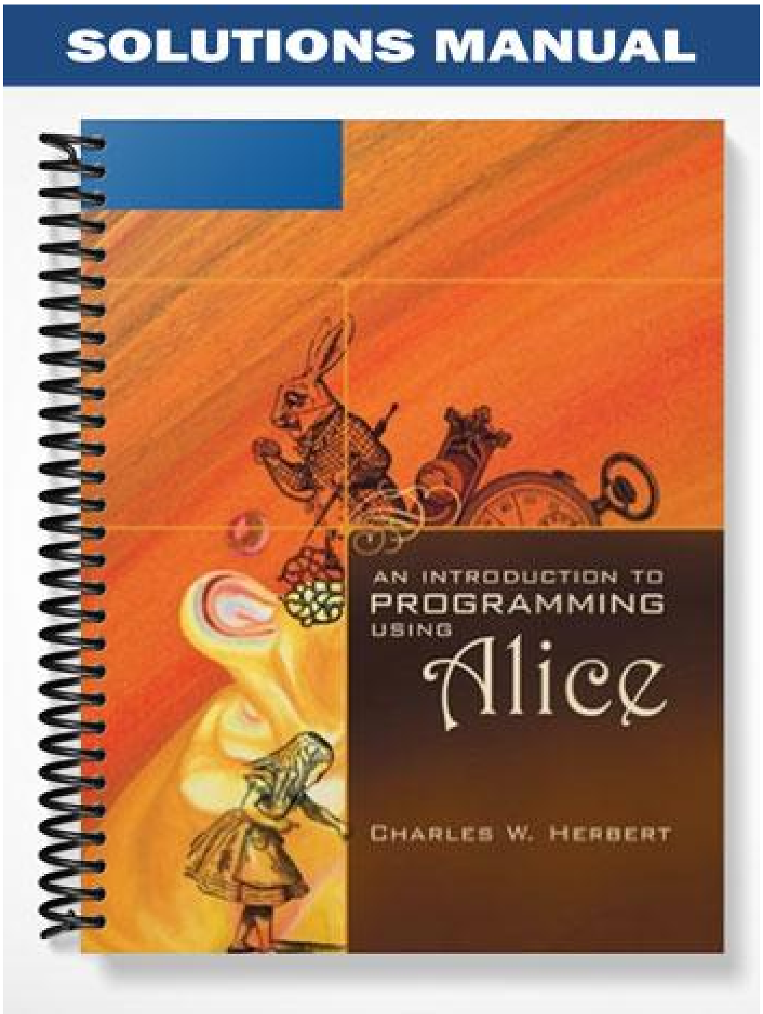
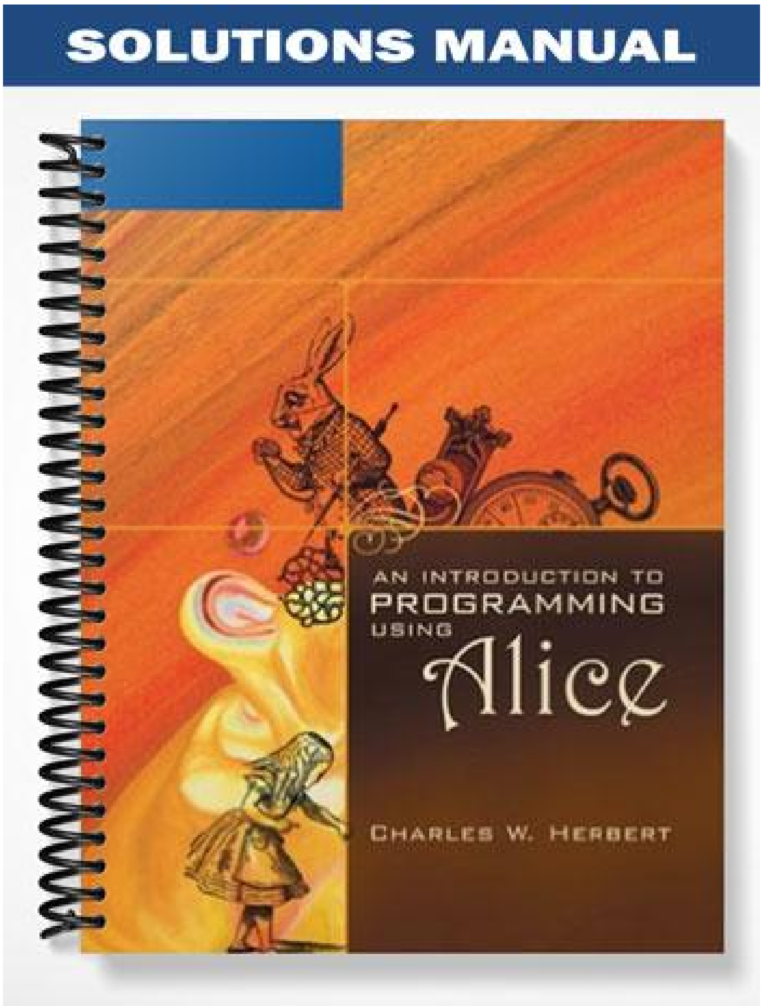


SOLUTIONS MANUAL

AN INTRODUCTION TO PROGRAMMING USING Alice

CHARLES W. HERBERT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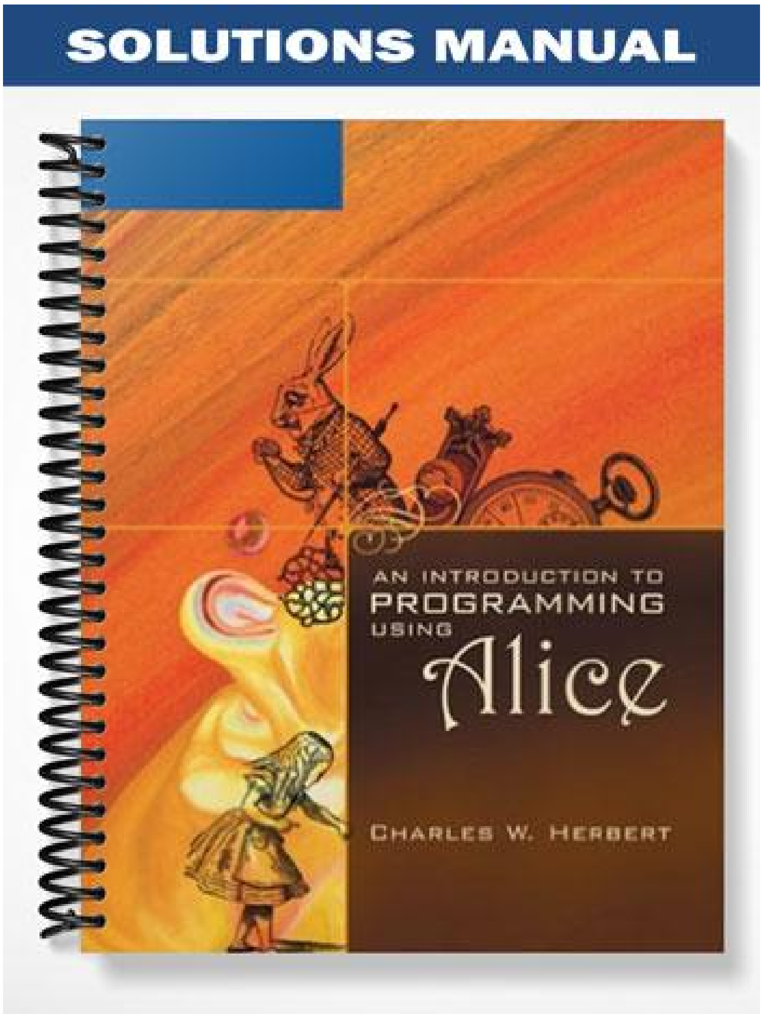

SOLUTIONS MANUAL

AN INTRODUCTION TO PROGRAMMING USING Alice

CHARLES W. HERBERT

An Introduction to Programming Using Alice

By Charles W. Herbert

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THOMSON COURSE TECHNOLOGY

Chapter 2 End of Chapter Exercises

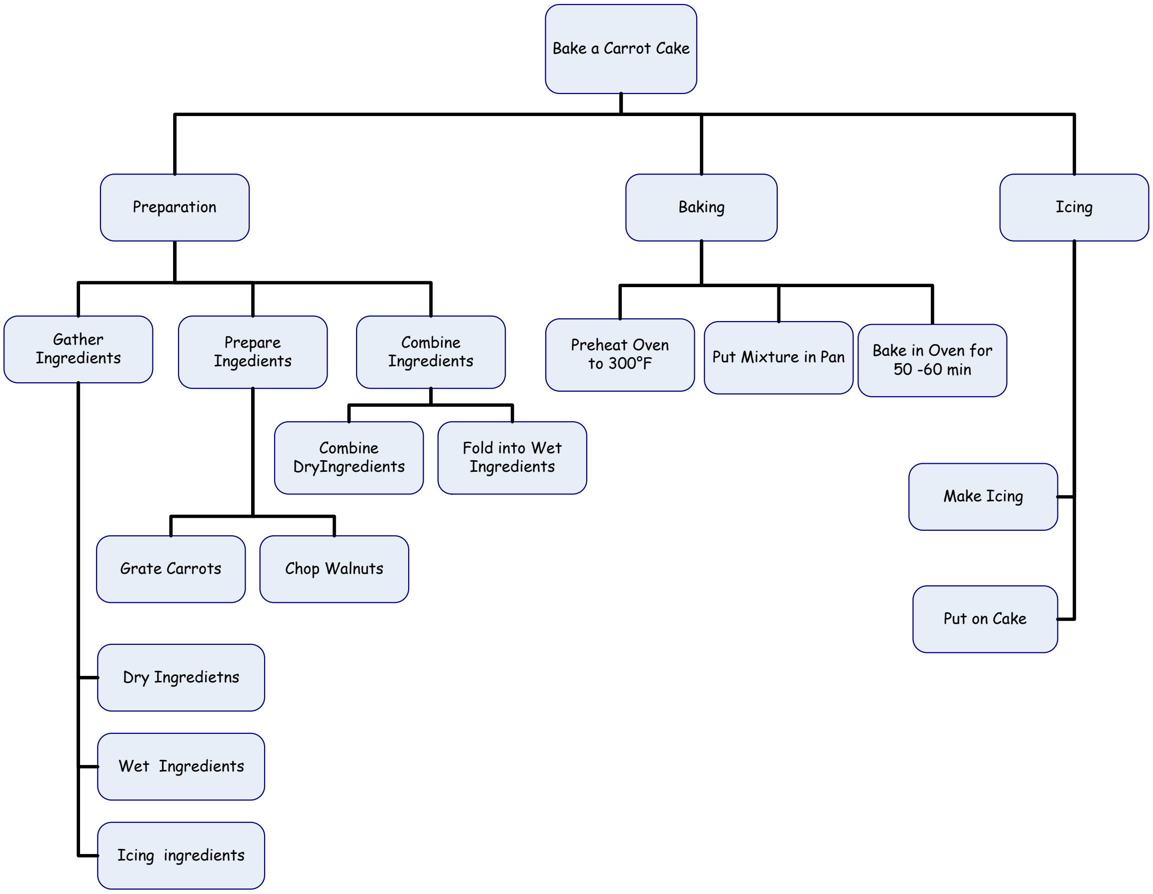
Exercise 2-1 A.

Sample answers for items 1A and 1B are included below. Similar Answers to 1C, 1D, and 1E vary widely.

Carnegie Mellon University's Computer Science Department has an online archive of recipes at: http://www.cs.cmu.edu/~mjw/recipes/ . I choose the carrot cake at: http://www.cs.cmu.edu/~mjw/recipes/cake/carrot-cake/carrot-cake-1.html

```
Carrot Cake

Dry Ingredients (Combine and set aside):
1 1/3 cups flour
1/2   tsp. salt
1 1/3 tsp. baking powder
1 1/3 tsp. baking soda
1 1/3 tsp. cinnamon
1/2   tsp. cloves
1/2   tsp. ginger

Combine:
1 cup sugar
1 cup cooking oil
3 eggs (added separately)

Preheat oven to 300 degrees Fahrenheit.
```

```
Add the dry ingredients to the wet mixture
and stir well.
Fold in two cups of grated carrots and 1
cup of chopped walnuts (optional).
Pour into 9x13" non-stick pan and bake for
50-60 minutes or until done.
(Make sure it is cooked)

Icing:
8 oz. package of cream cheese
1/2 cup butter (or less)
1 1/2 cup of icing sugar (I just add icing
sugar 'till the mixture tastes right)
```



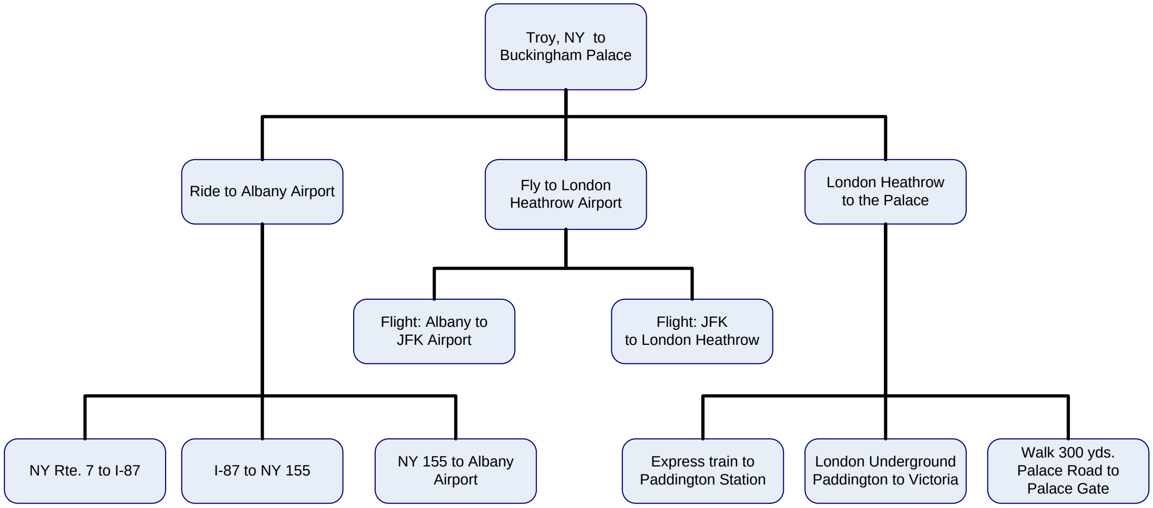
NOTE: These are Visio 2003 diagrams. If Visio is on your system you can double-click the image in Word to edit them. Visio is included in the MSDN Academic Alliance license. Of course hand-drawn diagrams are also acceptable. The original Visio files are in the directory that contained this document.

Exercise 2-1 B.

First, students need to find the directions; then they can organize them and diagram the parts. Here is a typical answer. I picked Troy, NY as the starting location. Most major cities have flights to London. Regional airports have flights to the hub cities. There are several alternatives upon arriving in London. Students can look up maps or travel information quickly on the internet. A Yahoo search turned up this page: http://answers.yahoo.com/question/index?qid=20061023102226AAC8gRl

The St. James and Green Park Underground stops are a little closer to the pPalace, and there are also bus and Taxi alternatives.

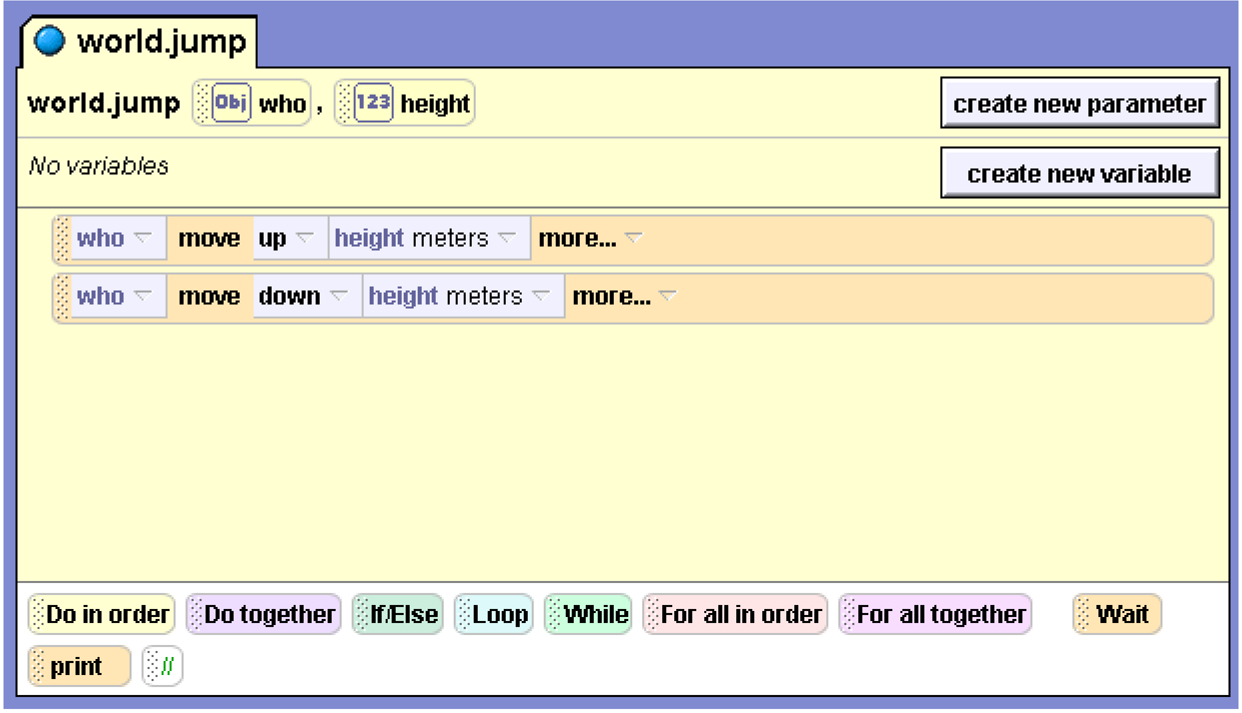
The important thing here is to see the journey as a collection of major steps that can be broken down into smaller steps.



Troy, NY to Buckingham Palace
Ride to Albany Airport
Fly to London Heathrow Airport
London Heathrow to the Palace
Flight: Albany to JFK Airport
Flight: JFK to London Heathrow
NY Rte. 7 to I-87
I-87 to NY 155
NY 155 to Albany Airport
Express train to Paddington Station
London Underground Paddington to Victoria
Walk 300 yds. Palace Road to Palace Gate

Exercise 2-2.

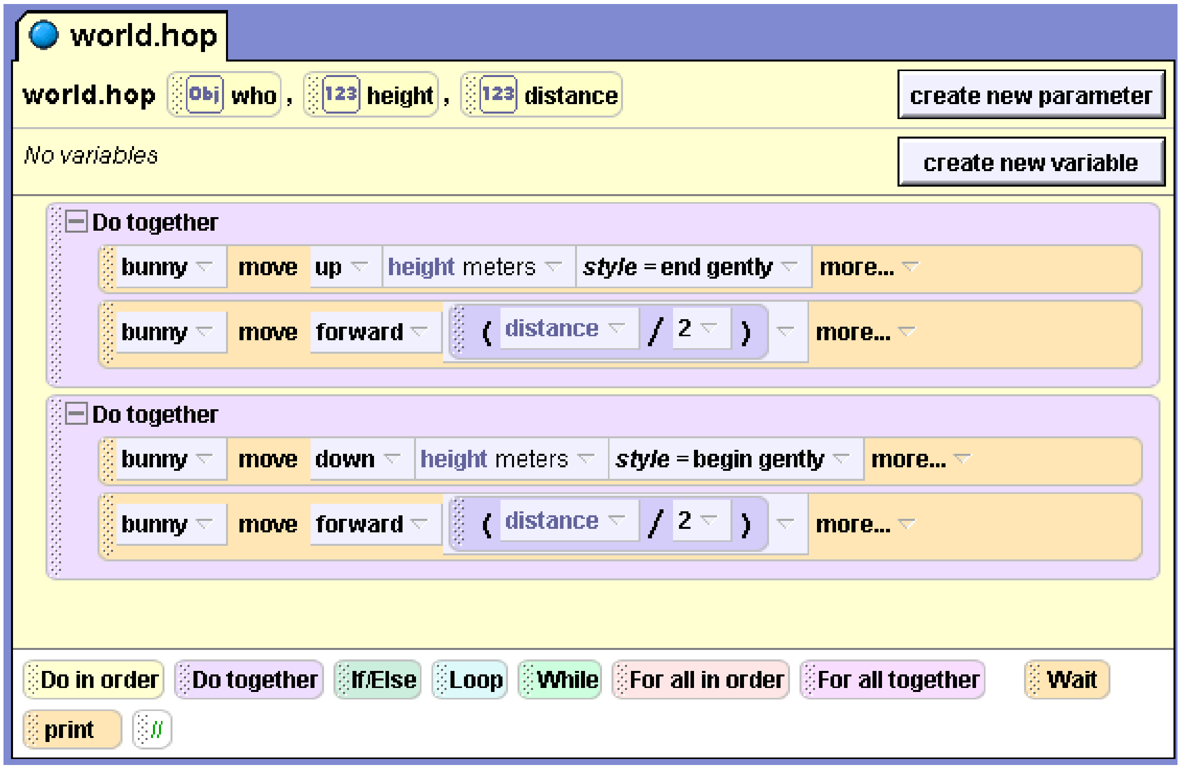
The Alice world in the file ***EX 2-2 Jump with height.a2w*** contains the modified jump method, shown below:



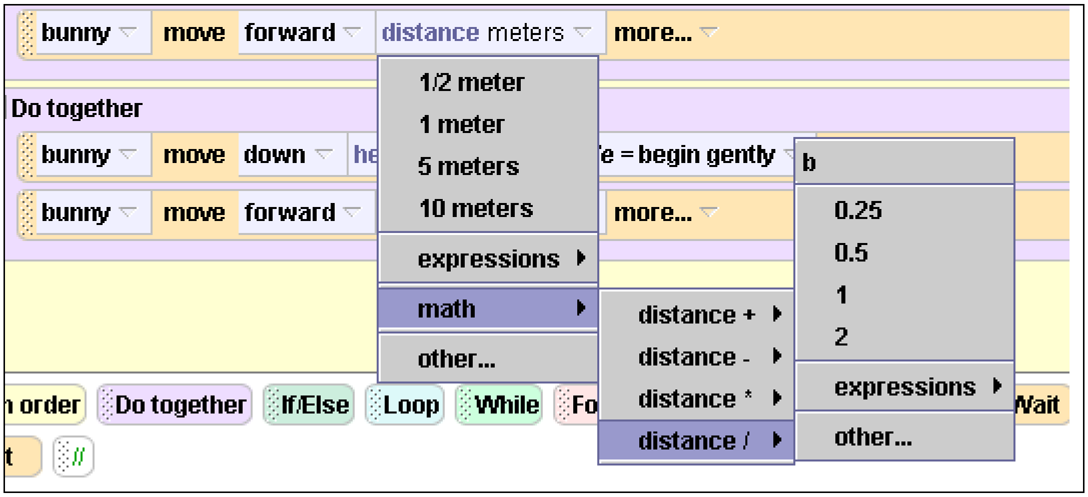
```
world.jump  Obj who , 123 height
No variables
who  move  up  height meters  more...
who  move  down  height meters  more...
```

Exercise 2-3.

The Alice world in the file ***EX 2-2 Generic hop.a2w*** contains the modified jump method, shown below. The change in the style parameter makes the hop look a little better. Students might also experiment with the duration parameter. Often they do not divide the distance by 2. This can be easily fixed by clicking on ***distance***, then selecting ***Math*** from the menu that appears, then ***distance /*,** as shown below.

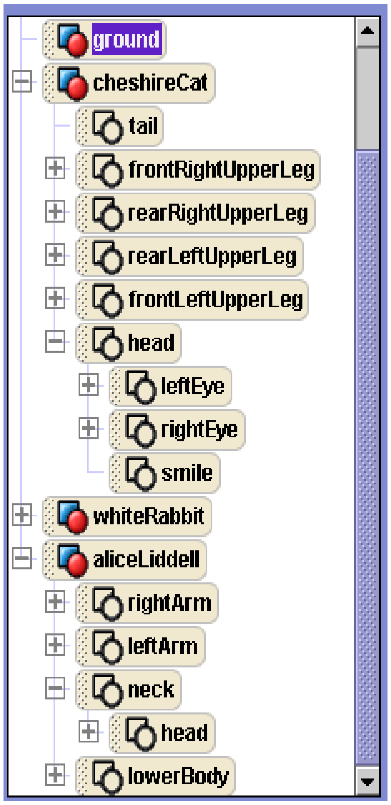


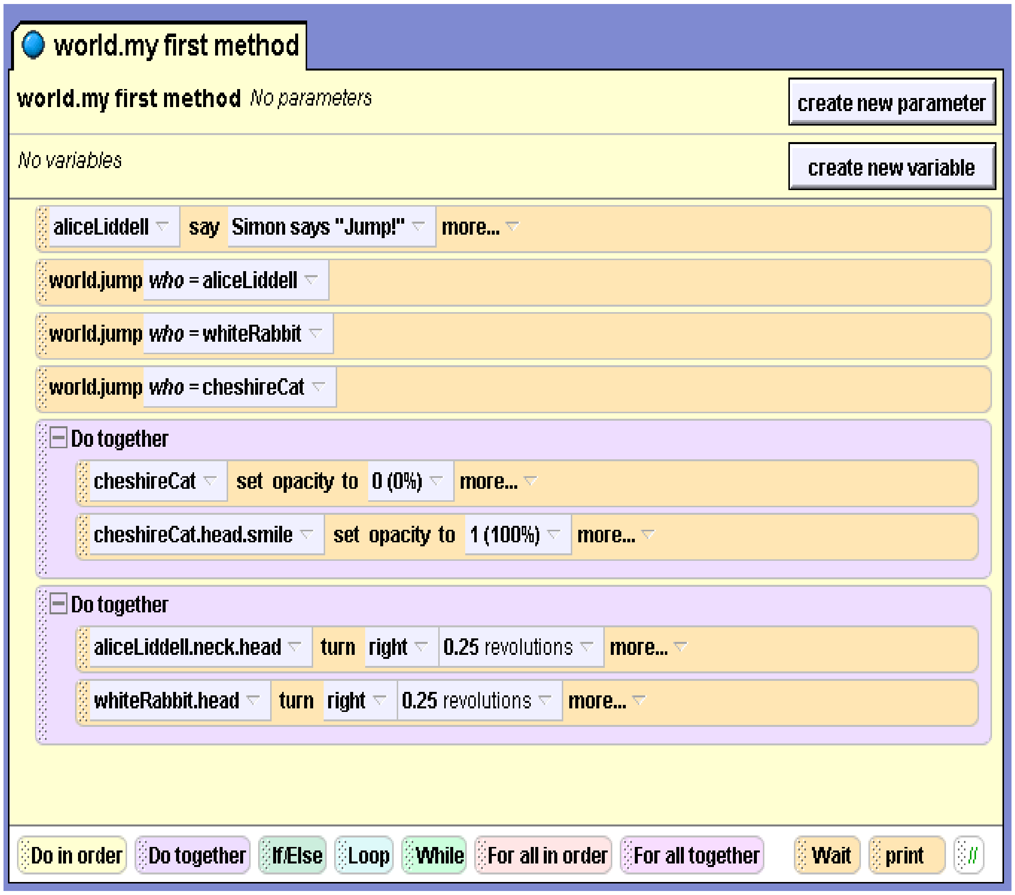
```
world.hop  Obj who , 123 height , 123 distance
No variables
Do together
    bunny move up height meters style = end gently more...
    bunny move forward ( distance / 2 ) more...
Do together
    bunny move down height meters style = begin gently more...
    bunny move forward ( distance / 2 ) more...
```



```
bunny move forward distance meters more...
Do together
    bunny move down he... style = begin gently
    bunny move forward more...
```

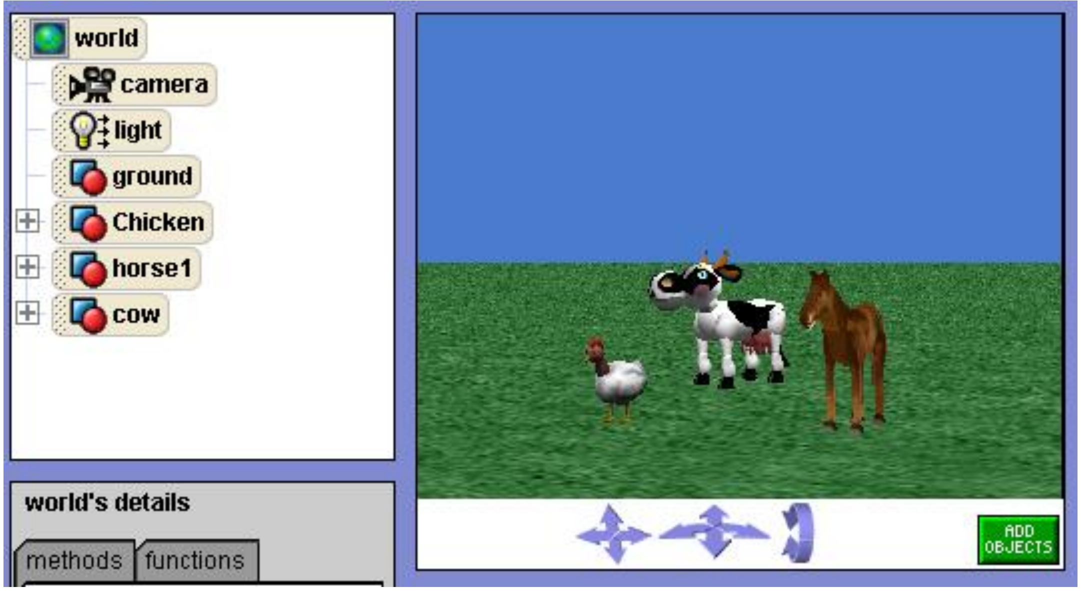
Exercise 2-4.
The Alice world in the file ***EX 2-2 Simon says.a2w*** contains the modified jump method, shown in the right-hand below. This exercise requires that students to expand the object tree to get to the parts of an object, as shown in the left-hand image below.





```
world.my first method
world.my first method  No parameters                    create new parameter
No variables                                            create new variable
aliceLiddell  say  Simon says "Jump!"  more...
world.jump who = aliceLiddell
world.jump who = whiteRabbit
world.jump who = cheshireCat
Do together
    cheshireCat  set opacity to  0 (0%)  more...
    cheshireCat.head.smile  set opacity to  1 (100%)  more...
Do together
    aliceLiddell.neck.head  turn  right  0.25 revolutions  more...
    whiteRabbit.head  turn  right  0.25 revolutions  more...
```

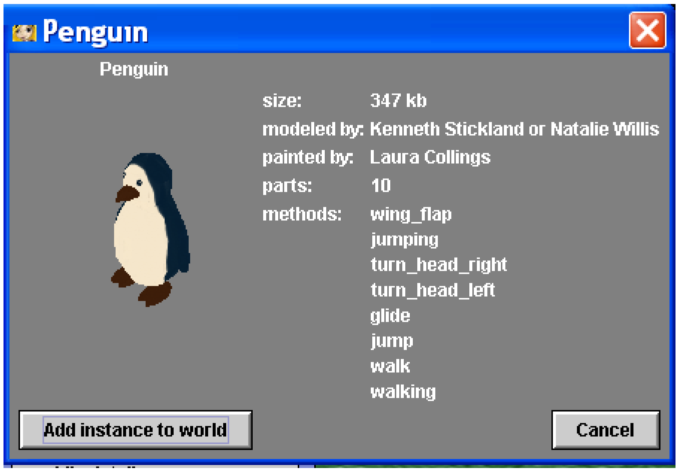
Exercise 2-5.
The name of the instance of the Chicken starts with a capital letter. For most Alice objects, such as the horse and cow, instance names start with lowercase letters and class names start with capital letters. The person who created the Chicken class of objects did it this way instead.



Exercise 2-6.

The name **"world.my first method"** should be **"world.myFirstMethod"** in camelCase.

The penguin class tile is shown below, with the names of the penguin's built-in user-created methods. In camerlCase, "Wing_flap" should be "wingFlap", **"turn_head_right"** should be **turnHeadRight**, and **"turn_head_left"** should be **turnHeadLeft.**

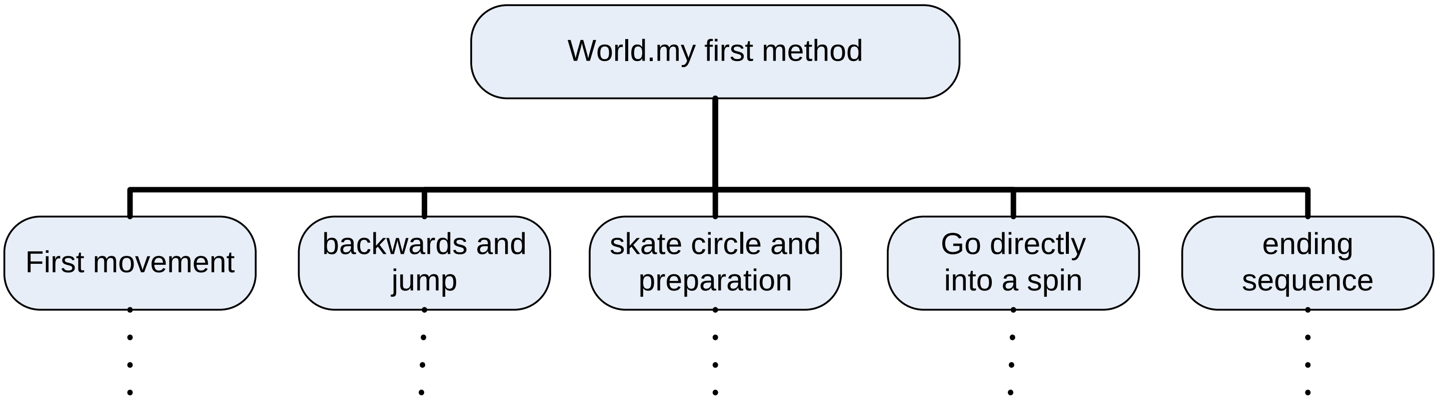


Penguin

size:	347 kb
modeled by:	Kenneth Stickland or Natalie Willis
painted by:	Laura Collings
parts:	10
methods:	wing_flap jumping turn_head_right turn_head_left glide jump walk walking

Exercise 2-7.

A, The file ***EX 2-7 lakeSkaterCode.HTML*** contains the code for the world in a single document that is easier to examine. Although the code does exhibit some modular design, it could be better, Methods like ***jump***, ***spin***, and ***circleAround*** are separate modules, but they are not reused as ***iceSkater.skate*** is. The most obvious improvement would be to break ***world.my first method*** into separate modules, guided by the comments in the code itself. The chart below is based on this. There are many ways to modularize this program, but this shows one way to start. The module names, except for ***"First movement"***, are based on the comments in the code.



Exercise 2.8

There are many different worlds that could be based on the 100 film quotes. The important things are for students to: 1. keep it simple, and 2. use good modular design and 3. plan the world before implementation.

Exercise 2.9

The file ***EX 2-9 JDE article.doc*** contains an article I wrote for the Journal of Developmental Education that disucsses Alkhwarizmi's importance. Many of the ideas from the ancient Greeks, such as the geometry of Euclid, were used in algorithms in Alkhwarizmi's work.

Exercise 2.10

Even more than with with exercise 2.8, above, this exercise could result in may different worlds, no two alike. The important things are for students to: 1. keep it simple, and 2. use good modular design, and 3. plan the world before implementation. This is a longer exercise that might be suitable for groups of students to complete together. Doing so will encourage them to articulate their ideas as they plan the world.