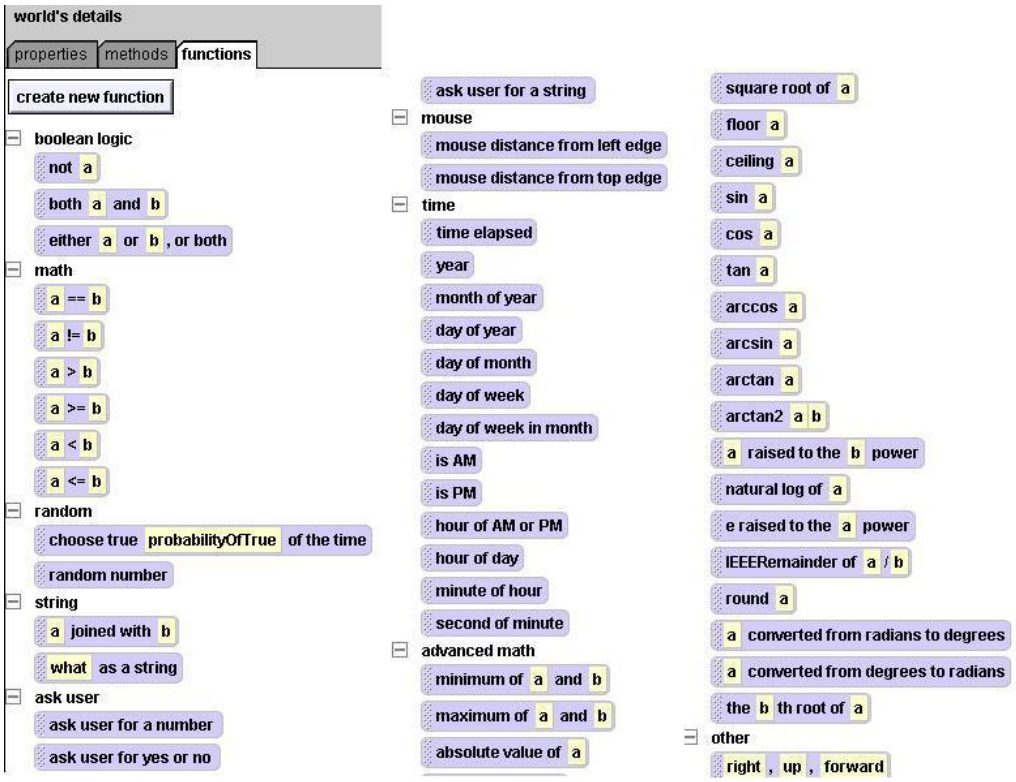
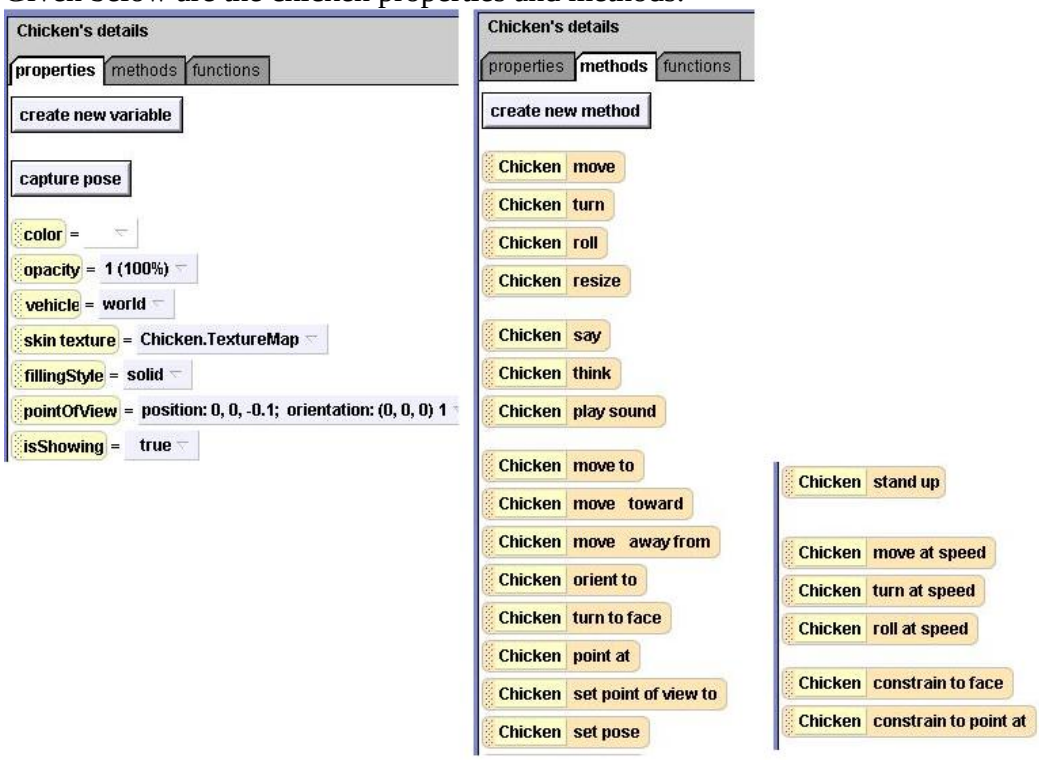
CompSci 4 Test 1 – Feb 17, 2009

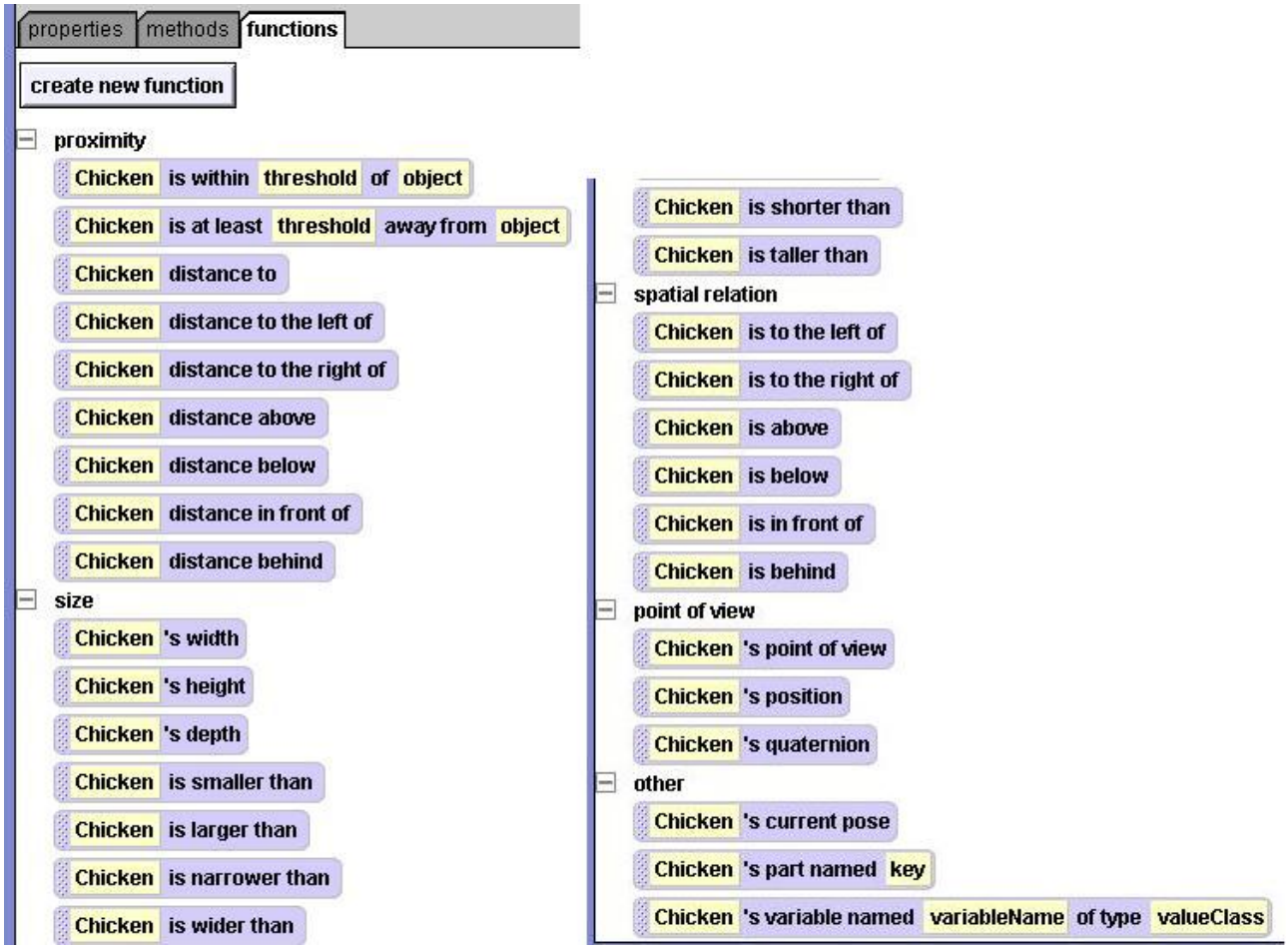
Given below are the world functions.



Given below are the chicken properties and methods.



Given below are the chicken functions.



Tiles at the bottom of the Alice window.

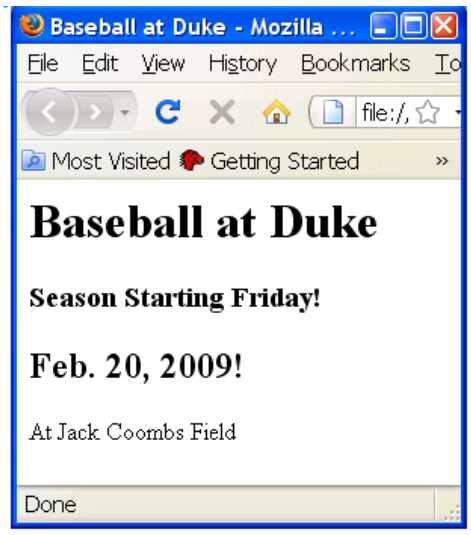
1. (3 pts) Consider the following html code.

```
<html>
<head>
<title> Baseball at Duke </title>
</head>
<body>
<h2> Baseball at Duke </h2>
<h2>  Season Starting Friday!</h2>
<hl>  Feb. 20, 2009!</hl>
<h3> At Jack Coombs Field</h3>
</body>
</html>
```

Which picture corresponds to this code?

A)

B)



C)

D)

2. (6 pts) Consider the following html code that is part of an .html page.

```
<p>
Did you know? <br> Duke University
was created in 1924 <br> by
<b> James Buchanan Duke <b> <br>
as a memorial to his father.
</p>
```

a) Explain what “br” and “b” tags do.

b) There is an error with the 2cd “b” tag, it is missing a slash. This page views on the web anyway, explain how the error affects the viewing of the page.
c) Write the text how it will appear on the web page.

3. (3 pts) Which of the following statements are true about the following html code?

```
<img src="http://www.cs.duke.edu/~rodger/blueDevil.jpeg">
```

A) This html code will be replaced with an image.
B) This html code will be replaced with the words “blueDevil” that will have a link to an image.
C) This html code will be displayed in addition to an image displayed.
D) There is an error because there is no text to be displayed with the image.

4. (3 pts) Consider the following html code.

```
<ol>
<li> Blue bug </li>
<li> Red rock </li>
<ul>
<li> Yellow yo-yo </li>
</ul>
<li> Green slime </li>
</ol>
```

Which one of the following is the portion of the html page produced by this html code?

A)
- Blue bug
    1. Red rock
    2. Yellow yo-yo
- Green slime

C)
- Blue bug
- Red rock
    1. Yellow yo-yo
- Green slime

B)
1. Blue bug
    - Red rock
    - Yellow yo-yo
2. Green slime

D)
1. Blue bug
2. Red rock
    - Yellow yo-yo
3. Green slime

5. (3 pts) Consider the following html code.

```
<table border=1>
<tr><td>Aunon</td> </tr> <tr><td>Bocci </td></tr>
<tr><td>Crawford</td></tr><tr><td>Northeim</td></tr>
<tr><td>Pince </td></tr> <tr><td>Wolff</td></tr>
</table>
```

Which picture corresponds to this code?

A)

Aunon	Bocci
Crawford	Northeim
Pince	Wolff

B)

Aunon	Bocci	Crawford
Northeim	Pince	Wolff

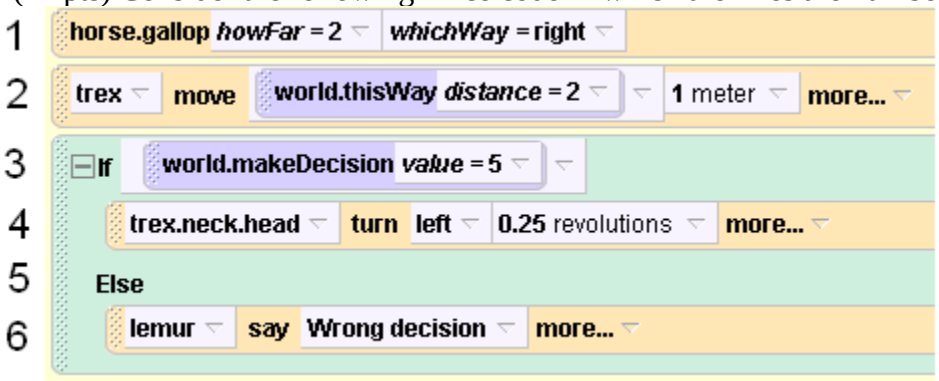
C)

Aunon
Bocci
Crawford
Northeim
Pince
Wolff

D)

Aunon	Bocci	Crawford	Northeim	Pince	Wolff

6. (3 pts) Which one of the following statement does not involve using multiple statements?
   A) Do In Order
   B) Do Together
   C) If Else
   D) Wait
7. (3 pts) Explain how to "glue" two objects together so when one moves the other moves with it, and how to "unglue" them.
8. (14 pts) Consider the following Alice code in which the lines are numbered.



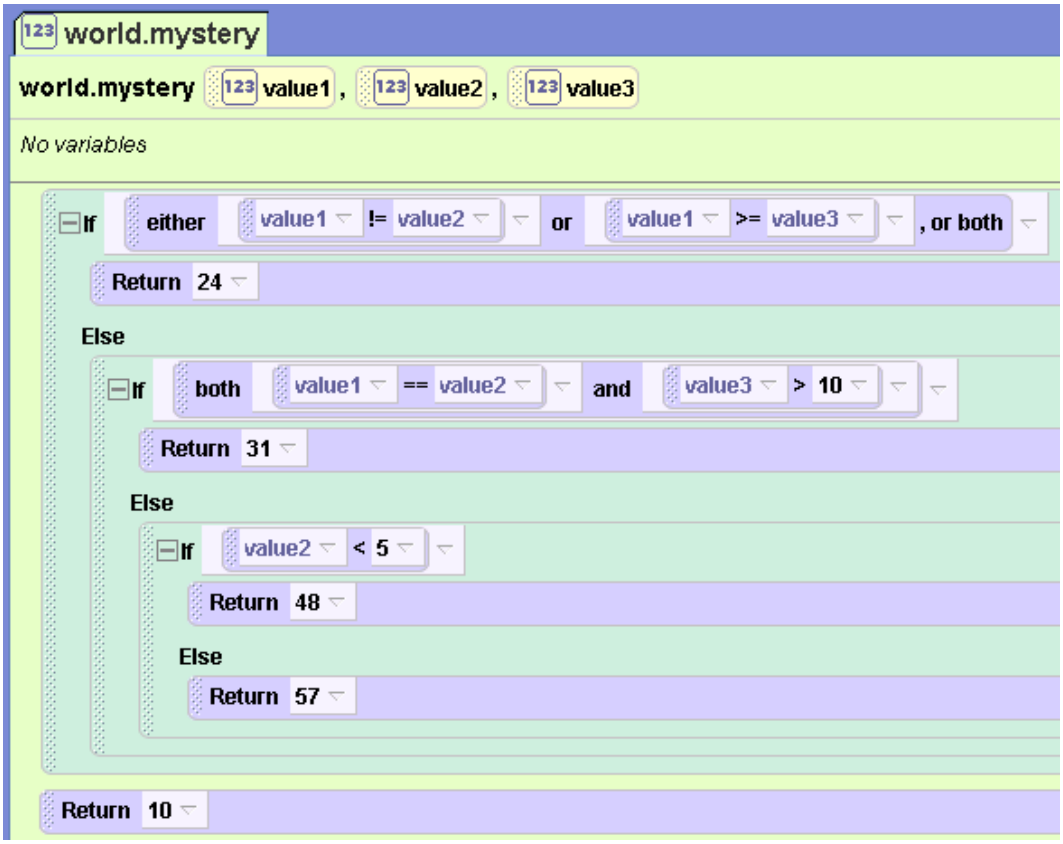
   A) In line 1, list the words that are parameters.
   B) In line 1, list the words that are arguments.
   C) In line 2, what type of value does the function `world.thisWay` return?.
   D) In line 3, list the name of the function and what type of value it returns.
   E) Name one method above that is a user-built class method.
   F) Explain what must be true for line 6 to be executed when this program runs.
   G) Give the name of the argument(s) in line 4.
9. (4 pts) Consider the following world that has the three objects: `tortoise`, `chicken` and `penguin` (shown below from left to right) and given code. The

world has been setup as shown below. The `chicken` is **exactly 1.0 meter** from the `tortoise`, and the `chicken` is **exactly 1.0 meter** from the `penguin`.

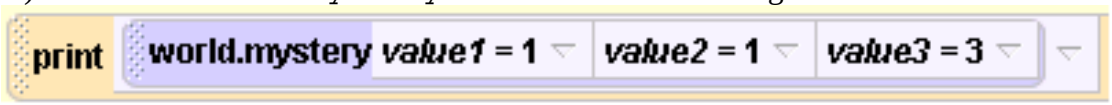
```
tortoise move right 0.5 meters more...
tortoise turn left 0.5 revolutions more...
penguin turn right 0.5 revolutions asSeenBy = Chicken more...
penguin set vehicle to tortoise more...
tortoise move backward 1 meter more...
penguin move right 1 meter more...
```

The diagram below is looking from above over the scene. The `tortoise` is represented by the square, the `chicken` is represented by the circle, and the `penguin` is represented by the hourglass. Using the diagram below, draw the path of `tortoise` as a solid line and the path of `penguin` as a dashed line.

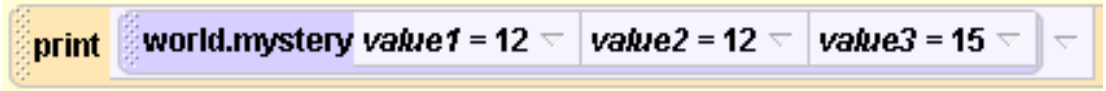
10. (6 pts) Consider the following `world.Mystery` function.



A) What does `world.Mystery` return when the following call is made?



B) What does `world.Mystery` return when the following call is made?



C) Give values for value1, value2, and value3 so that `world.Mystery` returns 57.

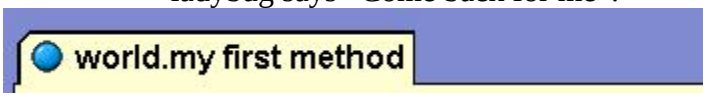
11. (10 pts) Consider the following Alice world that has four objects: `frog`, `ladybug`, `raft` and `lighthouse`.

The world starts as shown in the figure above with the frog and ladybug (the frog is to the left of the ladybug) sitting on the raft, and the raft's forward direction pointing towards the lighthouse. Write code to do the following in this order.

a) The raft should move forward towards the lighthouse stopping one meter before it gets to the lighthouse. (note you will need to consider the center

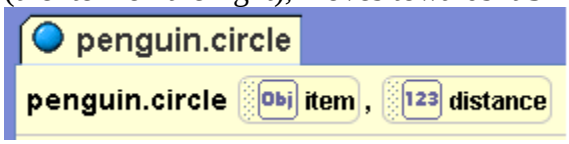
of the lighthouse and the center of the raft in this calculation). Make sure the frog moves with the raft but the ladybug does not.

b) The ladybug should move back to sitting on the ground.
c) The frog should move up 1 meter.
d) The raft should spin around twice (no other objects should spin around).
e) At the same time, the frog moves back down to sitting on the raft and the ladybug says "Come back for me".



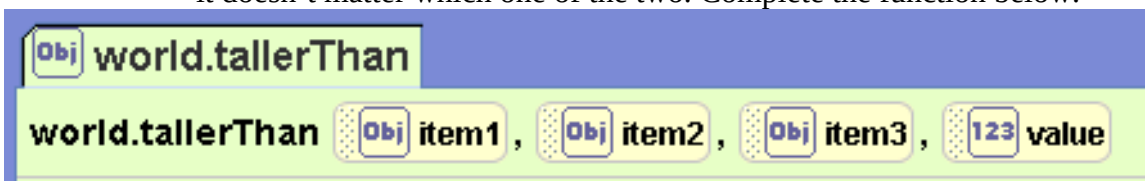
12. (8 pts) Complete the following class method called `circle` whose header is shown below. This method has two parameters, an object named "item," and a number named "distance." This method first has the penguin face the item, second move towards the item the specified distance, and then complete one circle around the item. You do not have to move the penguin's feet, just the penguin.

For example, in the first call above, the penguin faces the armchair, moves towards it 8 meters, and then circles around it once. In the second call, the penguin faces the coatrack (the item on the right), moves towards it 5 meters, and then circles around it once.



13. (8 pts) Complete the following function called `tallerThan` that has four parameters, three objects named `item1, item2`, and `item3`, and a number named `value`, and returns the object whose height is taller than value. You can assume that at least one of the three objects has height taller than value. If more than one does, then return either of those.

A) For example, in the picture above, there are three objects dragon, alienOnWheels and wizard. The dragon and the alienOnWheels are both taller than two meters and the wizard is shorter than 2 meters. In the example call above, either the dragon or alienOnWheels will be returned, it doesn't matter which one of the two. Complete the function below.



B) Using the objects dragon, alienOnWheels, and wizard, give the Alice code to have one of the objects taller than 1.5 meters disappear. Assume you don't know how tall any of the objects are, but you know at least one of them is taller than 1.5 meters. You must call the function you wrote in Part A) to receive full credit.

14. (13 pts) Consider an Alice world with the character pj and several balls: beachBall, basketballl and soccerBall.

A) (5 pts) Complete the following function called `furthestAway` that returns the object (of two objects) that is furthest away from PJ. This function has two object parameters named `ball1` and `ball2` and returns the one of these that is furthest away from PJ. You can assume the two objects have different distances from PJ.

B) (8 pts) Complete the following function called `furthestAwayOf3` that returns the object (of three objects) that is furthest away from PJ. This function has three object parameters named `ball1`, `ball2` and `ball3`, and returns the object (of the three) that is furthest away from PJ. You can assume that the three objects have different distances from PJ.