CompSci 4 Test 1 – Oct 3, 2013

Name (print): ________________________________________________________

Honor Ack. (signature): ____________________________________________________

Circle only one choice for each multiple choice question.

This test is 16 pages. The last page is blank and may be used as scratch paper.

ALL PAGES MUST BE TURNED IN or you will lose points!

You do not need any scratch paper for the exam, there is plenty of white space on the
exam. You only need a pen or pencil.

Make sure your initials are on any loose pages and readable.
Given below are the world functions.

<table>
<thead>
<tr>
<th>world's details</th>
<th>properties</th>
<th>methods</th>
<th>functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>create new function</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **boolean logic**
  - not \(a\)
  - both \(a\) and \(b\)
  - either \(a\) or \(b\), or both

- **math**
  - \(a = b\)
  - \(a \neq b\)
  - \(a > b\)
  - \(a \geq b\)
  - \(a < b\)
  - \(a \leq b\)

- **random**
  - choose true \(\text{probabilityOfTrue}\) of the time
  - random number

- **string**
  - \(a\) joined with \(b\)
  - what as a string

- **ask user**
  - ask user for a number
  - ask user for yes or no

- **mouse**
  - mouse distance from left edge
  - mouse distance from top edge

- **time**
  - time elapsed
  - year
  - month of year
  - day of year
  - day of month
  - day of week
  - day of week in month
  - is AM
  - is PM
  - hour of AM or PM
  - hour of day
  - minute of hour
  - second of minute
  - advanced math
    - minimum of \(a\) and \(b\)
    - maximum of \(a\) and \(b\)
    - absolute value of \(a\)

- **other**
  - \(a\) raised to the \(b\) power
  - \(a\) converted from radians to degrees
  - the \(b\)th root of \(a\)
  - round \(a\)
  - natural log of \(a\)
  - \(a\) converted from degrees to radians
  - IEEERemainder of \(a / b\)
  - square root of \(a\)
  - floor \(a\)
  - ceiling \(a\)
  - \(\sin a\)
  - \(\cos a\)
  - \(\tan a\)
  - \(\arccos a\)
  - \(\arcsin a\)
  - \(\arctan a\)
  - \(\arctan2 a b\)
  - right, up, forward
Given below are the chicken properties and methods.

<table>
<thead>
<tr>
<th>Chicken's details</th>
<th>Chicken's details</th>
</tr>
</thead>
<tbody>
<tr>
<td>properties</td>
<td>methods</td>
</tr>
<tr>
<td>create new variable</td>
<td>create new method</td>
</tr>
<tr>
<td>capture pose</td>
<td>Chicken move</td>
</tr>
<tr>
<td>color =</td>
<td>Chicken turn</td>
</tr>
<tr>
<td>opacity = 1 (100%)</td>
<td>Chicken roll</td>
</tr>
<tr>
<td>vehicle = world</td>
<td>Chicken resize</td>
</tr>
<tr>
<td>skin texture = Chicken_TextureMap</td>
<td>Chicken say</td>
</tr>
<tr>
<td>fillingStyle = solid</td>
<td>Chicken think</td>
</tr>
<tr>
<td>pointOfView = position: 0, 0, -0.1; orientation: (0, 0, 1) 1</td>
<td>Chicken play sound</td>
</tr>
<tr>
<td>isShowing = true</td>
<td>Chicken move to</td>
</tr>
<tr>
<td></td>
<td>Chicken move toward</td>
</tr>
<tr>
<td></td>
<td>Chicken move away from</td>
</tr>
<tr>
<td></td>
<td>Chicken orient to</td>
</tr>
<tr>
<td></td>
<td>Chicken turn to face</td>
</tr>
<tr>
<td></td>
<td>Chicken point at</td>
</tr>
<tr>
<td></td>
<td>Chicken set point of view to</td>
</tr>
<tr>
<td></td>
<td>Chicken set pose</td>
</tr>
</tbody>
</table>

|                  | Chicken stand up |
|                  | Chicken move at speed |
|                  | Chicken turn at speed |
|                  | Chicken roll at speed |
|                  | Chicken constrain to face |
|                  | Chicken constrain to point at |
Given below are the chicken functions.

Tiles at the bottom of the Alice window.
1. (3 pts) Consider the following html code.

```html
<html>
<body>
<h1> Basketball or Football? </h1>
<p> The Score was <em> 58-55, </em>
<br> what do you think </p>
<h2> Duke? </h2>
<h3> Pitt? </h3>
</body>
</html>
```

Which web page corresponds to this html code?

A) **Basketball or Football?**

   The Score was 58-55,
   *what do you think*

   Duke?

   Pitt?

B) **Basketball or Football?**

   The Score was 58-55,
   *what do you think*

   Duke?

   Pitt?

C) **Basketball or Football?**

   The Score was 58-55,
   *what do you think*

   Duke?

   Pitt?

D) **Basketball or Football?**

   The Score was 58-55,
   *what do you think*

   Duke?

   Pitt?
2. (3 pts) Consider the following HTML code that is supposed to display two links

```html
<p>click on either
<a href="friends.html">friends</a>
or
<a href="enemies.html">enemies</a>
</p>
```

but is displayed on a web page as:

click on either enemies

Explain what the error is and how to fix it.

3. (3 pts) Show how the following HTML code will be displayed. Be precise.

```
The NC State Fair <br> will be <br> <strong>Oct. 17-27</strong> <br> in Raleigh.
```
4. (3 pts) Consider the following html code.

```
<ul>
  <li> Blue </li>
  <li> Red </li>
  <li> Green </li>
</ol>
<ol>
  <li> Yellow </li>
  <li> Purple </li>
  <li> White </li>
</ol>
```

Which one of the following is the corresponding picture to this html code?

A) • Blue
   1. Red
   2. Green
   • Yellow
   1. Purple
   2. White

B) 1. Blue
   • Red
   • Green
   2. Yellow
   • Purple
   • White

C) • Blue
   • Red
   1. Green
   • Yellow
   • Purple
   1. White

D) 1. Blue
   2. Red
   • Green
   3. Yellow
   4. Purple
   • White
5. (3 pts) Consider the following HTML code.

```html
<table border=1>
<tr><td>peach</td> <td>kiwi</td> </tr>
<tr><td>apple</td> <td>pear</td> <td>plum</td> </tr>
<tr><td>orange</td> <td>fig</td> </tr>
</table>
```

Which picture corresponds to this code?

A) ![A]  

B) ![B]  

C) ![C]  

D) ![D]  

6. (3 pts) Consider the following Alice code where the color is red. What does this code do?

![Code.png](attachment:Code.png)

A) Changes the entire chicken to red  
B) Changes only the chicken’s head to red  
C) Changes the chicken and the ground to red  
D) Changes the whole world to the color red

7. (3 pts) Explain the difference between this code:

![Code1.png](attachment:Code1.png)  
and this code:

![Code2.png](attachment:Code2.png)
8. (16 pts) Consider the following Alice code in which the lines are numbered.

A) In line 1, what is the name of the function and what type does it return?

B) In line 2, what type is “kangaroo is wider than camel”?

C) In line 3, is “camel distance to turtle” a built-in function or a built-in method?

D) What must be true in order for line 5 to execute?

E) In line 5, is world.mystery a function or a method?

F) From line 6, list the words that are arguments.

G) From line 6, list the words that are parameters.

H) In line 6, list the name of the function and the type of value it returns.
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.

The diagram below is looking from above over the scene. The tortoise is represented by the T, the chicken is represented by the C, and the penguin is represented by the P. The animals are facing the bottom of the page. Using the diagram below, draw the path of tortoise and penguin as a solid line and the path of chicken as a dashed line.
10. (4 pts) Consider the following `world.Mystery` function.

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

```plaintext
print world.mystery value1 = 1 \ value2 = 6 \ value3 = 0
```

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

```plaintext
print world.mystery value1 = 8 \ value2 = 3 \ value3 = 1
```
11. (10 pts) Consider the following Alice world that has three objects: skaterGirl, skateboard and palmTree.

The world starts as shown in the figure above with the skaterGirl facing offscreen. Write code to do the following in this order. When you move the skaterGirl you do not need to move her legs, just move her.

a) The skaterGirl should face the skateboard then move over to it and get on top of it.
b) The skaterGirl and skateboard should then move around the palm tree.
c) Then the skaterGirl and skateboard should move out of view.
12. (8 pts) Complete the following class method called `bumpOver` whose header is shown below. This method has two parameters, an object named “item,” and a number named “amount.” This method first has the penguin face the item, then the penguin moves close to the item, the item turns ¼ the same direction the penguin is facing and then moves the same direction the penguin is facing for “amount” distance. In the figures below, the first figure shows the start. Suppose cone2 is the cone closest to the camera and the call is “world.bumpOver item=cone2 amount=2”. Then the second figure shows the penguin close to cone2 and cone2 has already turned, the third figure shows the same cone has moved 2 units distance, the same direction the penguin is facing.

Complete the code below.
13. (12 pts) Complete the following function called `HeightOfTaller` that has two object parameters, one named `critter1`, one object named `critter2`, and returns the height of the taller critter.

A) Complete the function below.

```plaintext
world.HeightOfTaller
world.HeightOfTaller [obj] critter1, [obj] critter2
```

B) Assume there are two objects chicken, and chicken2. Give Alice code to have both chickens move up in the air the height of the tallest chicken. (You don’t need to move them back down afterwards).

You must call the function you wrote in Part A) to receive full credit.
C) Complete the following function called heightOfRed which has two object parameters: critter1 and critter2. This function returns the height of a red colored critter if there is one, or returns 0 if neither critter is red. If both critters are red, it returns the height of critter1.
(extra page, must turn in)