

Exam 1
Computer Programming 230
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Thursday, 1 October 2009

NAME (Printed) _____
NAME (Signed) _____
E-mail _____

Exam Rules

- Show all your work. Your grade will be based on the work shown.
- The exam is closed book and closed notes.
- When taking the exam, you may have with you pens or pencils, and an 8 1/2" x 11" piece of paper filled with notes, programs, etc.
- You may not use a computer or calculator.
- All books and bags must be left at the front of the classroom during this exam.
- **Do not open this exams until instructed to do so.**

Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
Question 6	
Question 7	
Question 8	
Question 9	
Question 10	
TOTAL	

1. True or False:

- (a) ___ Everything in an Alice world is an object.
- (b) ___ Methods cannot call other methods.
- (c) ___ There are many predefined classes in Alice that the programmer can choose from.
- (d) ___ A variable can be used anywhere in the program, even before the declaration.
- (e) ___ The random number generation function only produces numbers between 0 and 1.
- (f) ___ Only one or two parameters can be accepted by a method.
- (g) ___ Comments in your program tell the computer how to run your program.
- (h) ___ Both portions of an **If/Else** statement must contain statements.
- (i) ___ An **If/Else** statement can be included in either part of another **If/Else** statement.
- (j) ___ The loop never stops if the condition remains false.

2. (a) Explain what a loop statement does:

(b) What is an infinite loop? Give an example.

3. Write the Alice commands that will modify the **cow** object to be 50% transparent, blue, and riding in the **helicopter** object (ie set the vehicle to helicopter).

Properties	Answer
color opacity vehicle skin texture fillingStyle pointOfView is Showing	

4. To the right of each line of code, indicate the value of the logical expression after those lines have been executed.

(a) `Continue = true`

`Stop = false`

expression	True or False?
<code>!Stop</code>	

(b) `a = -1, b = 2, c = 5`

expression	True or False?
<code>(c - 2) == 0</code>	

(c) (no change)

expression	True or False?
<code>a != 0</code>	

(d) Increment `a` by 1

expression	True or False?
<code>a == 0</code>	

(e) Increment `b` by 3

expression	True or False?
<code>b == c</code>	

(f) Set Value of `a` to `b+c`

expression	True or False?
<code>(a == 0) AND Stop</code>	

(g) Set Value of `Stop` to `true`

expression	True or False?
<code>!Stop OR Stop</code>	

(h) (no change)

expression	True or False?
<code>!Continue AND Stop</code>	

(i) (no change)

expression	True or False?
<code>(a ≥ b/2) AND (c ≥ b)</code>	

(j) (no change)

expression	True or False?
<code>(IEEERemainder of c/2) == 0</code>	

5. Assume that the object `frog` has a method called `hop` with parameter, `distance` that controls how far forward the frog hops. Write the `my first method` that makes the frog hop 1 meter, 2 meters, and then 3 meters.

`my first method:`

6. Write the `my first method` for a world that shows an astronaut bounding across the lunar landscape, then planting a flag, turning around, and heading back to his initial position.

In addition, assume that the following methods have already been written for you:

```
astronaut.bound()  
astronaut.plantFlag()
```

`my first method:`

7. (a) Write an **If/Else** statement that causes an object called **bunny** to double in size 30% of the time.

- (b) Write an **If/Else** statement that causes an object called **bunny** to turn red if it is within 2 meters of an object called **stove**, otherwise the bunny should turn blue

8. In words, what does the following loop do?

```
world.my first method ( )  
  No variables  
  
  // Programming Project 3.5  
  
  Do together  
    While ( both ( ( frog distance in front of square asSeenBy = ground ) > 0.25 )  
      and ( ( frog2 distance in front of square asSeenBy = ground ) > 0.25 ) )  
      Do together  
        camera move amount = 1 meter toward target = stop style = abruptly duration  
          = 1.5 seconds  
        frog.hop ( random number minimum = 0.25 maximum = 2.25 )  
        frog2.hop ( random number minimum = 0.25 maximum = 2.25 )
```

9. Write the `my first method` which contains a `Loop` statement that causes an object `skater` to spin in place 10 times. You may assume that the method `skater.spin` already exists.

`my first method:`

10. Write the method `DeliverCrate` method for the object `Blimp`. Your method should check to see if the `Blimp` is directly above the `Boat` using the `is Above` function. If it is, an object `Crate` should fall from the blimp to the boat (it may miss). The crate then "disappears" (ie becomes invisible and returns to the blimp). This should be repeated forever.

(Suggestions: You may assume that the blimp is always 50 meters from the ocean. Further, making the blimp the "vehicle" for the crate will make it travel with the blimp.)