Check-Up Questions for Exam 1 of CS 202

Lecture: Algorithms

- 1. What is an algorithm?
- 2. Which of the following are examples of algorithms?
 - •a recipe
 - •a maze
 - •a solution for solving a rubix cube
 - •a zipcode
 - programming languages such as Scratch
- 3. True or False:
 - •An algorithm can return different output in different circumstances?

Lecture: Programming Languages

- 1. In Scratch, what is the difference between a block and a script?
- 2. What is the difference between a Sprite and a costume?
- 3. Under what category would you find the following blocks: "move x steps"? "next costume"? "repeat"?
- 4. How many total steps will a Sprite running this script move?



Lecture: Art

- 1. What happens if you don't specify the initial state of your program?
- 2. Which are likely to be used for initialization?

```
point in direction 90 v

go to x: 0 y: -76 change size by 10

glide 1 secs to x: 0 y: -76 show

switch to costume costume1 v

pen up

next costume
```

Lecture: Animation and Abstraction

- 1. In your animated story all the scripts are running at the same time. What did you do wrong?
- 2. Can a Sprite receive a message it broadcast?
- 3. When will this code work correctly? when not?



Lecture: Decision Trees

1. Can you draw the corresponding decision tree for these scripts?



Lecture: Remember with Variables

- 1. For the following script, what is the output if user enters:
- •95?
- •100?
- •105?
- •63?
- 2. What input could have given if you see the output "Great"?

```
when clicked

ask Enter the numeric grade you received... and wait

if answer < 100

if answer > 90

say Excellent! for 2 secs

else

if answer > 80

say Great! for 2 secs

else

if answer > 70

say Good! for 2 secs

else

say Better luck next time! for 2 secs

else

say Perfect! for 2 secs

else

say How did you do that? for 2 secs
```

3. For the following script, what happens to the value of x over time if x is initially 2? Input x = 8? Input x = 5?

```
when clicked

ask Please Input x and wait

set x to answer

repeat until x = 1

if x mod 2 = 0

set x to x / 2

else

set x to 3 * x + 1
```

Lecture: Races

Consider the following two scripts.

- 1. Will two scripts run concurrently?
- 2. Will cat turn while Cave music is playing?
- 3. Will cat move while Cave music is playing?
- 4. Will cat change colors while Cave music is playing?

```
when clicked

forever

turn (* 15 degrees
move 10 steps

when clicked

forever

change color effect by 25
play sound Cave until done
```

Lecture: Simple Games

In one version, Stage broadcasts to 10, then each Number broadcasts to next:

```
when I receive 10 ▼

wait until touching mouse ▼?

play sound recording1 ▼

set size to 150 %

broadcast 11 ▼
```

1. If the Stage runs the following script, could this result in the same behavior?



2. Could the Stage just broadcast instead of broadcast and wait?

Lecture: Probability Trials

1. What 3 things are missing in the following script? (Look for "think" blocks or "Hmmm..." variables)

```
when I receive Ready
hide
go to front
ask How many trials do you want to perform? and wait
set Trials to answer
think Hmm... for 2 secs
repeat Hmmm....
 set X- to pick random -150 to 150
 set Y to pick random -150 to 150
  set Scaled X v to abs v of X / 150
  set Scaled Y v to abs v of Y / 150
 go to x: 💢 y:
 go to front
 show
 stamp
         Scaled X * Scaled X + Scaled Y * Scaled Y
   think Hmm... for 2 secs
set Piv to ( Hits / Trials)
```

Lecture: Strategy Games

Which are true for the minimax algorithm?

- •Uses psychology to guess what a human will do
- •Uses probability to make the best decisions
- •Used for games of chance
- •Allows the computer to win every game
- •Will find a winning move if it exists
- •Assumes human opponent makes best possible moves
- •Assigns "1" to end states where computer wins
- •Propagates min value when it is human's turn next
- •Can result in a huge number of states for complex games like chess
- •Humans can use minimax algorithm