

Final Exam – CISC 1600 Introduction to Multimedia Computing
Section TR2, Thu May 21, 2020 (1:00 – 3:00pm)

1. True or false (15 points)

True False

- | | |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1) <input type="radio"/> O <input type="radio"/> O | 1) An agent is something that can perceive and act upon the perception autonomously. |
| 2) <input type="radio"/> O <input type="radio"/> O | 2) Objects in object-oriented programming are more powerful than agents. |
| 3) <input type="radio"/> O <input type="radio"/> O | 3) There is a formula you can follow for creating successful games. |
| 4) <input type="radio"/> O <input type="radio"/> O | 4) Games are commonly held to a higher standard than other types of programs. |
| 5) <input type="radio"/> O <input type="radio"/> O | 5) Event handlers are named for you, but you need to write for their body. |
| 6) <input type="radio"/> O <input type="radio"/> O | 6) Studies have shown game players can tolerate longer wait time on desktop than handheld devices. |
| 7) <input type="radio"/> O <input type="radio"/> O | 7) There are 8 comparisons to make in order to test if a particle is touching a rectangle. |
| 8) <input type="radio"/> O <input type="radio"/> O | 8) There is only 1 comparison to make in order to test if two spheres have collided. |
| 9) <input type="radio"/> O <input type="radio"/> O | 9) <i>Minkowski Sum</i> is for further reducing number of tests in collision detection. |
| 10) <input type="radio"/> O <input type="radio"/> O | 10) Game states are equivalent to object states when using object-oriented programming. |
| 11) <input type="radio"/> O <input type="radio"/> O | 11) Determining the exact collision time allows more realistic collision response. |
| 12) <input type="radio"/> O <input type="radio"/> O | 12) Overlap testing may fail with objects that move too slowly. |
| 13) <input type="radio"/> O <input type="radio"/> O | 13) Vector-based object representation in games is more mathematically costly. |
| 14) <input type="radio"/> O <input type="radio"/> O | 14) <i>Procedural</i> programming paradigm is equivalent to making a “smart” list. |
| 15) <input type="radio"/> O <input type="radio"/> O | 15) <i>Scratch</i> mainly supports two-dimensional graphics. |

2. Multiple choices (Choose the best answer; 10 points in total; 1 point each)

- 1) All of the following are motivations for a markup language except for ___?
- (a) sharing formatted text easily
 - (b) enhancing the comprehension of the text
 - (c) separating the formatting from the text itself
 - (d) controlling the behavior of a computer easily
- 2) The tag is used ___
- (a) as a placeholder to insert style sheet for inline element
 - (b) as a placeholder to insert style sheet for block element
 - (c) as a formatting tag to determine horizontal span
 - (d) as a formatting tag to connect two elements together
- 3) Which of the following is NOT a key quality that distinguishes agents from arbitrary programs?
- (a) persistence
 - (b) object-oriented implementation
 - (c) reaction to the environment
 - (d) autonomy
- 4) Which of the following is an optional component of an agent?
- (a) sensors
 - (b) actuators/effectors
 - (c) reasoning
 - (d) learning

- 5) All of the following are heuristics developed over the years for making games more fun, except for ____.
- (a) multiple, clear achievable goals
 - (b) the illusion of choice
 - (c) clear punishments and rewards
 - (d) compelling storylines
- 6) From the game development paradigm, MDA, the letter M (mechanics) refers to all of the following except for ____.
- (a) the programming language
 - (b) the objects in the game
 - (c) the hardware platform used
 - (d) the programming libraries
- 7) From MDA, the letter D (dynamics) refers to all the following except for ____.
- (a) the domain of the game
 - (b) the players in the game
 - (c) the physical looks of all players
 - (d) the rules of the game
- 8) From MDA, the letter A (aesthetics) refers to all the following except for ____.
- (a) the color palette
 - (b) texture & surface
 - (c) game engines
 - (d) the user interface
- 9) Which of the following is NOT one of the programming paradigms?
- (a) procedural
 - (b) integrated development environment
 - (c) agent-based
 - (d) imperative
- 10) *NetLogo* is developed and maintained by ____
- (a) Northwestern University
 - (b) Microsoft
 - (c) Google
 - (d) MIT

3. HTML/CSS/Internet (18 points)

- 1) (4-pt) What is the motivation of Responsive Web Design (RWD)? What are the aspects of RWD?

2) (9-pt) Correcting HTML/CSS errors

This is mypage.html

```
1) <!DOCTYPE html> <html>
2) <head>
3) <href rel="stylesheet" type="text/css"
   link="mystyle.css">
4) <head/>

5) <body>
6) <title>Heading 1</title>
7) <hr />
8) <h2>Heading 2</h2>
9) <p>Visit ur <a link=
   "http://www.w3schools.com/css/">
   CSS Tutorial</a>.</p>
10) <ol><li>HTML</li><li>CSS</li>
11) <p>Favorite drinks:</p>
12) <ul><li>Smoothie</li><li>Green tea</li>
    <li>Coffee</li>

13) </body>
14) </html>
```

This is mystyle.css

```
1) body
2) (
3)   font-size: 75%,
4)   font-family: verdana, arial,
      'sans serif',
5)   background-color: #FFFFFF0,
6)   color: #FF00GG,
7) )
```

Given the HTML/CSS code shown to the left and above (named `mypage.html` and `mystyle.css` respectively), there are some errors in both files (please note that line numbers are not part of the files).

Write down your corrections (note: you may choose to make corrections directly in the code as long as they're legible):

a) Your corrections for **`mypage.html`** (Please say which line, what error, and how to fix it):

b) Your corrections for **`mystyle.css`** (Please say which line, what error, and how to fix it):

3) (5-pt) Internet related questions

a) (2-pt) What are the benefits of packet switching over circuit switching?

b) (3-pt) What are protocols? Name one lower level protocol (device to device) and one higher level protocol (program to program).

4. Processing (14 points)

1) (4-pt) Comparing bitmap images with vector graphics,

a) What are the advantages/disadvantages of either format?

b) Explain why vector graphics can be blown up to any size without losing quality.

2) (10-pt) Help me debug the following Processing program:

a) In the program on the right, there are a number of **syntax** errors. Say which line, what error and how to fix the error.

```
1) float x=0,
2) float y=0;

3) setup() {
4)     size(300, 300);
5)     fill(#808080);
6) }

7) void draw() {
8)     background(ffffff);
9)     if (keyPressed);
10)    line(0, 0, x, y);
11)    else
12)        rect(x, y, 50, 50);
13) }

14) void mouseClicked() {
15)    fill(#000000);
16)    x = x + 5;
17)    y = y + 5;
18) }
```

Then answer the following questions (be as specific as you can - say what shape, size, color, and at what position on what background):

b) What does the window show initially without any user action?

c) What is shown after a mouse button is clicked once?

d) After c), what is shown when a key is pressed and held on?

5. Agent-based Simulation (18 points)

1) (6-pt)

a) What are the two main benefits of simulation in general? Can you think of one specific use scenario of simulation for educational purpose?

b) Explain why *NetLogo* is chosen as the programming environment for creating simulations.

2) (2-pt) Give two reasons why one wants to develop a system consisting of multiple agents.

3) (10-pt) The following NetLogo program is adapted from the finished Lab3-2 (assume all variables are properly set):

a) List all user-defined variable names in the program (they will all appear in black within the IDE):

b) What is the intended agent behavior from lines 02-05?
(note: behavior should be described in a way so a lay person would understand)

c) What is the result of lines 06-09?

d) What is the intended agent behavior from lines 10-12?

e) What is the purpose of lines 15-17?

```
01) ask turtles [  
02)   if pcolor = green [  
03)     set pcolor brown  
04)     set energy energy + energy1  
05)   ]  
06)   let candidates patches in-radius  
      vision-range with [ pcolor = green ]  
07)   ifelse any? candidates  
08)     [ face one-of candidates ]  
09)     [ rt random 360 ]  
10)   fd 1  
11)   set energy energy - 1  
12)   set age age + 1  
13) ]  
14)  
15) ask patches [  
16)   if random 100 < 2 [ set pcolor green ]  
17) ]
```

6. Game Programming (25 points)

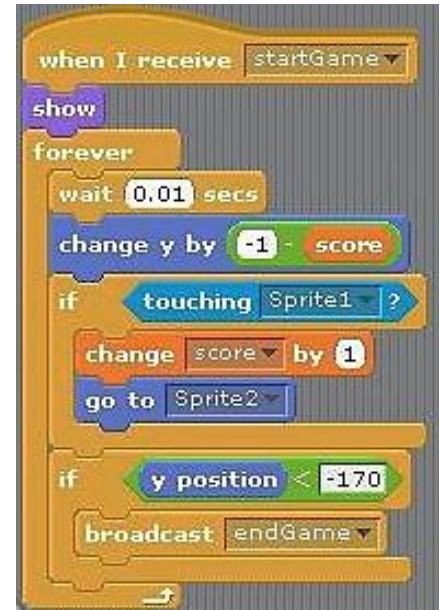
- 1) (2-pt) Why are games considered the perfect example of multimedia programs?
- 2) (2-pt) What is a visual programming language? Give one main benefit of using *Scratch* for game programming.
- 3) (3-pt) What are the two competing views on game studies? How do they differ in their ultimate goals?
- 4) (5-pt) What are the three categories of fun people enjoy in gameplay, as proposed in the “*Theory of Natural funativity*”? Give examples for any two of them in typical game activities.
- 5) (3-pt) How many comparisons are needed to test if two squares of different sizes have a collision? Explain why.

6) (10-pt) For the **Egg Catcher** game (**lab4-1**, a cat catching a beach ball from a parrot), given **script-1**, and **script-2**,

a) Say (one example for each) where *imperative* paradigm (specifically, “selection” and “repetition”), and *procedural* paradigm (“procedure call”) are used in **script-1**. (Please say selection: then name the block)

b) Which sprites are controlled by **script-1** and **script-2**, respectively? (give name, such as cat, or parrot, or beach ball)

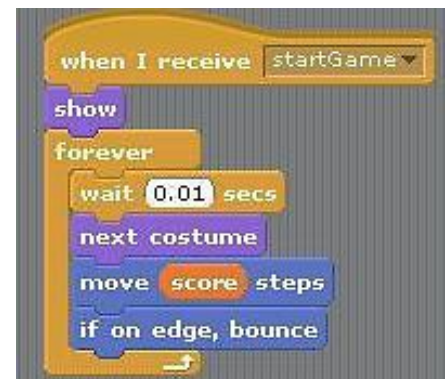
c) What is the purpose of the statement “change y by -1 - score” in **script-1**? Why is **score** used here?



Script-1

d) What is the purpose of “go to **Sprite2**” in **script-1**?

e) What does the condition: “if **y position** < -170” in **script-1** physically mean?



Script-2

f) What is the purpose of “next costume” in **script-2**?