

**UNCA CSCI 107**  
**Ordinary Exam 1**  
7 March, 2015

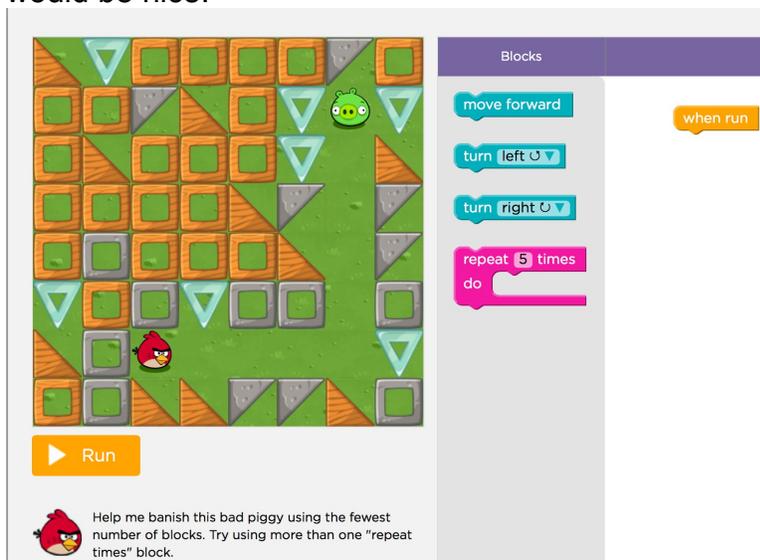
This is a closed book and closed notes exam. It is to be turned in by 10:50 AM.

Communication with anyone other than the instructor is not allowed during the exam. Calculators may be used during this exam, but cell phones and any other electronic or communication devices may not.

Name: \_\_\_\_\_

**Problem 1 (5 points)**

How could you use the repeat to get the bird to the frog. Drawing the needed blocks would be nice.



The image shows a game level from Angry Birds with a Scratch-like block editor. The game board features a red bird at the bottom left, a green piggy at the top right, and a path of green blocks. The block editor on the right contains the following blocks: a yellow 'when run' block, three blue blocks for 'move forward', 'turn left', and 'turn right', and a pink 'repeat 5 times' block with a 'do' loop. A 'Run' button is at the bottom left of the game board. Below the game board, a small red bird icon is next to the text: 'Help me banish this bad piggy using the fewest number of blocks. Try using more than one "repeat times" block.'

**Problem 2 (5 points)**

How many values can be encoded using 5 bits?

**Problem 3 (5 points)**

If you want to encode 96 possible values, how many bits are needed.

**Problem 4 (5 points)**

If a  $600 \times 400$  image is encoded in color with separate 8-bit values for each RGB color component, how many bits are needed to encode the image?

**Problem 5 (10 points)**

Programming can be complicated, but most programmers think there are three common elements of programming. Name and describe these three elements.

**Problem 6 (15 points)**

Describe the structures of the eye that respond to light. Point out ways in which the characteristics of these structures have influenced the ways in which images are digitally encoded.

**Problem 7 (15 points)**

Raster and vector graphics are two different ways of encoding images. Four different types of visual image are described below. For each, state if it would be better encoding with raster or vector graphics. Given a brief (about one sentence) reason for your choice.

- Elizabeth Taylor's eyes (they were violet)
- Eye chart (the ones used to test if you need glasses)
- Automobile drawing for a fancy magazine
- Automobile schematic for a fancy car manufacturer

**Problem 8 (10 points)**

In the CSS color specification, the color name “Red” has the RGB value (255,0,0). What do you think the RGB values for the color names “Pink” and “DarkRed” might be? It's not important to get the right answer, just explain the reasons for your choice.

**Problem 9 (10 points)**

Why was CSS invented?

**Problem 10 (20 points)**

Write some HTML that might describe a page displayed in the following manner:

