

CS10 Spring 2013 Midterm Rubric (Answers + Explanations + Scoring Guidelines)

Questions 1-11 were all worth 2 points. Note that the question numbers may be different depending on the version you had.

Question 1: Circle TRUE or FALSE (and explain): "Recursion is more powerful than iteration":

FALSE. Anything written recursively can be written iteratively, and vice-versa.

One point was given for getting False and 1 point was given for a correct reason.

Question 2: What was Koomey's Law? (*hint: it was one of the "technology in the news" items recently*)

Koomey found that efficiency (amount of power needed to calculate something) doubled every 18 months.

Two points was given for a fully correct answer. One point was given for at least mentioning energy.

Question 3: What issue from the "Changing Education Paradigms" video resonated the most with you?

Two points for mentioning a topic which was in the video. No points were given for incorrect answers or those that mentioned computers.

Question 4: What was the lesson to be learned from Karen Owen's PowerPoint experience?

That once things go digital, and shared online, they can go viral, and exist in the ether, permanently.

Two points were given for mentioning at least one lesson, zero otherwise.

Question 5: There's a flu epidemic going around; every day every sick person infects one new healthy person. In 30 days it overwhelms the population and society collapses. On what day was it only *half* as devastating?

The next to last day ... the 29th day.

Question 6: What is a negative unintended consequence of Geo-Tagging multimedia?

Two points was given for any negative consequence of GeoTagging, zero points otherwise.

Question 7: Explain what is one thing that could spell the end of "Moore's Law".

(1) Technical barriers (2) Economics (might not be cost effective) (3) Laws of physics

Two points were given for any answer which tried to explain one of the above.

Question 8: Kevin Slavin's TED talk showed Amazon selling *The Making of the Fly* for \$1.7 Million. How?

Two points for mentioning algorithms without human oversight or algorithms that "run amok", zero otherwise.

Question 9: Why do London citizens decry that Orwell's dystopian future is *already* in present-day London?

Two points were given for mentioning surveillance and/or cameras, zero otherwise.

Question 10: According to *Amdahl's law*, what's the max speedup of code that's parallel? 80%=5x, 75%=4x

Two points for a correct answer. 1 point was awarded for the following: 1/4, 5/4, 3, 4, 4/3, or 1/5.

Question 11: Encode "I LOVE CS" or "GO BEARS" using a very simple *Caesar cipher*:

J MPWF DT or HP CFBST

Two points was given for answers with one or no incorrect letters.

Question 12:

5 points.

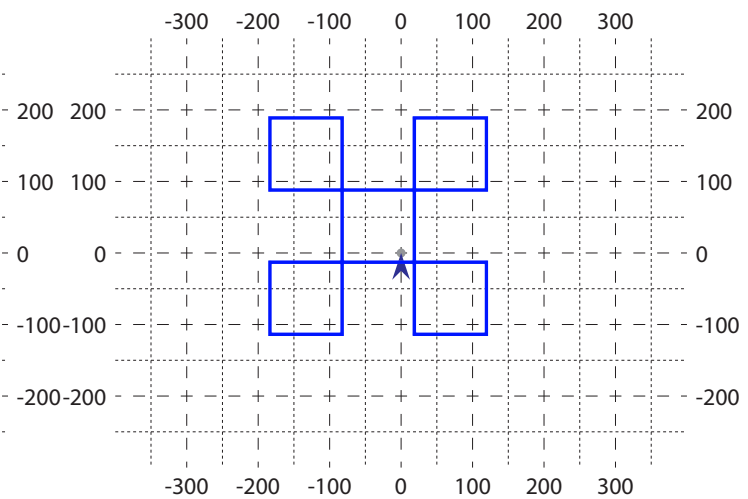
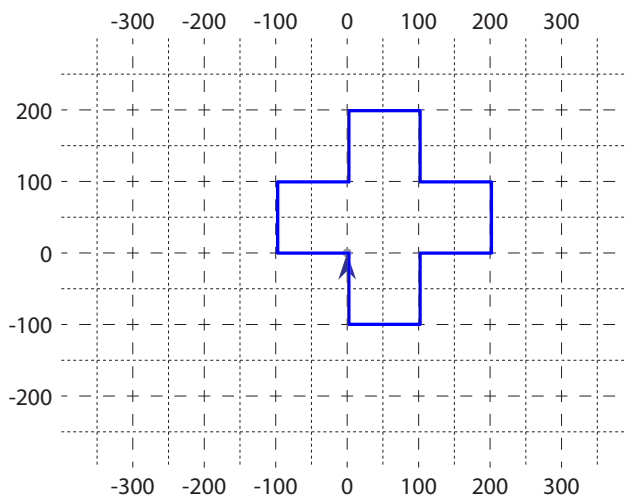
(Left)

+5 points for a correct answer

+4 if the scale was off or the position was shifted in some way

+3 if drawing starts correctly, but gets lost

+1 for getting the first move and turn



Question 13: Draw all the faces that could result from running this new parallel code. You may not need all the blanks. These result from interlacing 3 LeftEye/RightEye/Mouth Clear (LC,RC,MC), LeftEye(L), RightEye(R), & Mouth(M).

RC,R,MC,M,LC,L	LC,L,MC,M,RC,R	LC,L,RC,R,MC,M	RC,R,MC,LC,M,L	LC,L,MC,RC,M,R	MC,M,LC,RC,L,R	RC,LC,MC,R,L,M		

The question was worth 5 points.

+1 for recognizing each of the 1-item and 2-item cases. (D

+1 for each full set (3 drawings) of 1-part and 2-part faces.

+1 for drawing a full face (Drawing 3 items)

For example, if you forgot boxes 5 and 6 you would get 4 points.

Optionally, if you 'rotated' the locations of the face items, you were awarded 2 points if drew all six combinations of possible rotations.

Question 14:

Part a) 2 points (all or nothing)

b) 1 point (all or nothing)

c) 3 points

d) 4 points; 2 per each part.

a) Order of growth? Linear (it just scans through the sensor list and counts OFF-ON patterns)

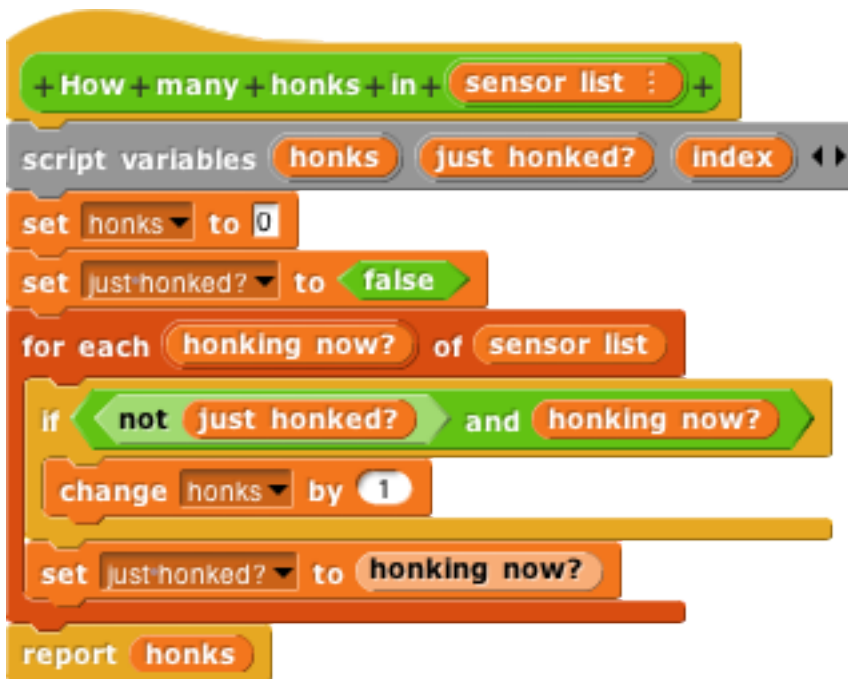
b) 3

c) (FALSE) DID: 1, SHOULD: 0 OR (TRUE) DID: 0, SHOULD: 1

d) The code as exists searches for when honks STOP. This assumes they've been going before the simulation started (just honked initialized to <true>), and looking for a ON-OFF pattern. We need to change it so that it searches for when honks START. This means we initialize just honked to <false> and look for an OFF-ON pattern = not(just honked?)and(honking now?)

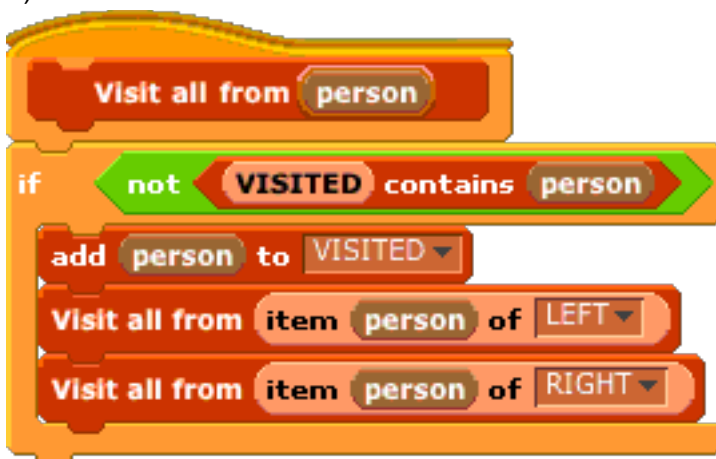
#1) CHANGE set(just honked?)to<true> TO set(just honked?)to<false>

#2) CHANGE if((just honked?) and (not(honking now?)))
TO if(not(just honked?) and (honking now?))



Question 15:

a)



b) Order of growth? **Linear** (if the "contains" block is constant) or **quadratic** (if the "contains" block is linear), even though it appears to be exponential (two recursive calls). That's because the base case test prevents the standard exponential growth that happens with two calls; it short-circuits it.