CS10 Spring 2018 Midterm 2 Answers

Question 7: A predicate block (a function) takes in an arbitrary list and determines if it's sorted. You test it on 100 different lists and find it always works as promised. What do you know about the block? Since it's a function, the same inputs yields the same outputs, so it WILL work on the 100 lists again. It certainly might not work on all lists, but just because it works on the first 100 doesn't mean that it won't crash on the 101st list. So **It *may* not work on the 101st list.**

Question 8: Which was mentioned in the *Computing in Education* lecture? **Sir Ken Robinson believed the current education system favors convergent (vs divergent) thinking** ["there's 1 answer, at the back of the book, & don't cheat"]

Question 9: What does ACM advocate is done to curb (or at least reduce) Algorithmic Bias? **All of the above.**

Question 10: You were handed a plastic card in class. What superpower does it allow? **It allows you to simulate a universal turing machine, as powerful a computer as can ever be invented.**
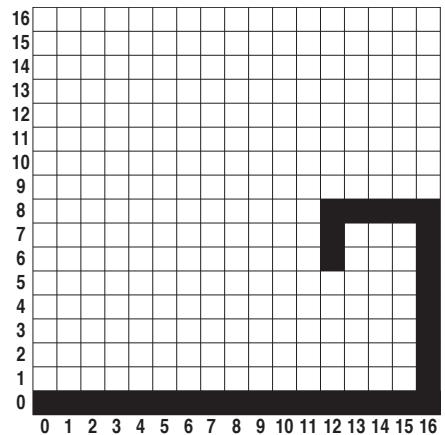
Question 11: Which of these are examples why your information footprint is larger than you think? All of the above

Question 12: What is 10_{16} times 10_2? $10_{16} = 16_{10}$, $10_2 = 2_{10}$. Therefore, $16_{10} * 2_{10} = 32_{10}$

Question 13a: Shade in (completely!) *all* the pixels that are filled in after

Fun 16 . The sprite starts at (0,0), facing right. The pen is already down. See the image on the right.

Question 13b: Which way is the sprite facing at the end of the call?. Starts facing right. At the end of 16 it's Up, at the end of 8, it's Left, at the end of 4 it's Down, at the end of 2 it's Right, and it never runs length=1, so **Right**

Question 13c: What is the running time of **Fun**? Assume **move** is a constant-time operation. length gets cut in half every time, (as an example, when length was 16 it only ran 4 times), so **Logarithmic, Reasonable**

Question 14: The CSforALL effort is taking effect countrywide and researchers want to know how well it's going. They collect the **name**, **gender**, **state** and **final score** (from 1-5) of every high school senior taking the new AP CS Principles course. Thankfully everyone has a different name! This is all stored in a central database called **DB** (a big, global Snap! list), in which each list entry is a different student record (which itself is just a list of all the values for each student). Here's an example of (a very small) **DB**; the actual **DB** has thousands of entries.

Question 14a: If we wanted to know *how many Females took the test*, we could count the length of the output of which expression to process records from **DB**? **A single keep**

Question 14b: If we wanted to know *how many Females <u>from TX</u> took the test*, we could count the length of the output of which expression to process records from **DB**? **A single keep**

Question 14c: what does the following do?   (Select ONE)
 Return a list of the English equivalent of every AP score

Question 14d: Given *just* **DB** (and no other file, list, or knowledge of the world) what *couldn't we* determine? **The states who had no test-takers in it (if any),** since there would be no way to find the names of the states with no students.