UC Berkeley's CS10 Fall 2017 Quest – Instructor Dan Garcia

Your Name (first last) | *SID* | *Lab TA's Name*

← *Name of person on left (or aisle)* | *Name of person on right (or aisle)* →

What's that Smell? Oh, it's Potpourri! (2 pts for 1-6, we drop lowest one)

Fill in the correct circles & squares completely…like this: ● *(select ONE)* ■ *(select ALL that apply)*

Question 1: Which is *NOT* a benefit of (the computer science definition of) Abstraction? (select ONE)

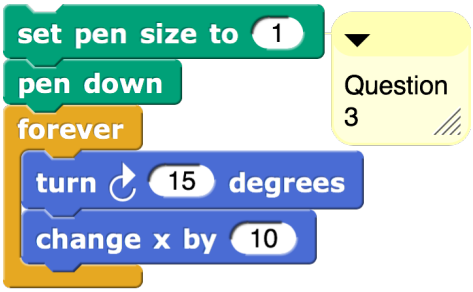
- ○ It saves you similar duplicate pages in your recipe books.
- ○ People who learned to drive fifty years ago could still drive today.
- ○ It's easier to debug abstract ideas because they have no concrete form.
- ○ If you are writing a simulation, you can ignore the details that aren't relevant to the system being simulated.

Question 2: What is the *hex* value of the expression: 10_{10} (decimal) + 101_2 (binary)? (select ONE)

○ 0x3	○ 0x8	○ 0x9	○ 0xA	○ 0xB	○ 0xC	○ 0xD	○ 0xE	○ 0xF	○ 0x15	○ 0x111

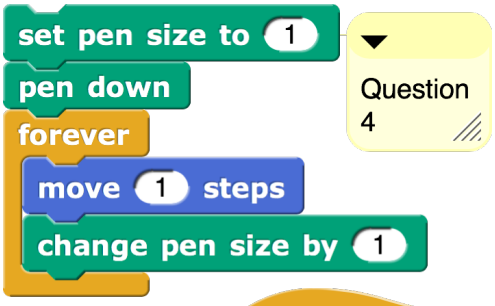
Question 3: If the sprite starts in the middle of the stage facing up & runs the script to the right, what is *eventually drawn on the stage* after the stage stops changing? (select ONE)

○ Dot	○ Line	○ Spiral	○ Circle	○ Triangle	○ None of these



Question 4: If the sprite starts in the middle of the stage facing up & runs the script to the right, what is *eventually drawn on the stage* after the stage stops changing? (select ONE)

○ Dot	○ Line	○ Spiral	○ Circle	○ Triangle	○ None of these

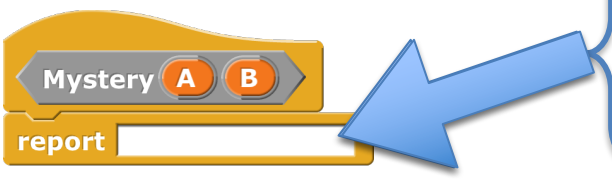


(The block on the far right is used for Questions 5 & 6)

Question 5: If the output from `Mystery` is true, which can you say *for sure*? (select ALL that apply)

☐ A must be true	☐ B must be true	☐ A must be false	☐ B must be false	☐ None of these

Question 6: You realize you could replace the *entire* body of `Mystery` with a single `report` (as shown below). What could go in there so `Mystery` functions the same for all values of Boolean inputs A and B? (select ALL that apply)



- ☐ A and B
- ☐ A or B
- ☐ not A and not B
- ☐ not A or not B
- ☐ not A or B
- ☐ not A and B

Question 7: What does it mean for a language to be "Turing Complete"? (select ONE) 2pts

- ○ Alan Turing was able to *complete a set of programming challenges using it*.
- ○ Alan Turing was able to *completely write the language himself*.
- ○ The language was able to *simulate a Universal Turing Machine*; i.e, it was as powerful as any could be.
- ○ The language was able to *pass the "Turing Test"*.

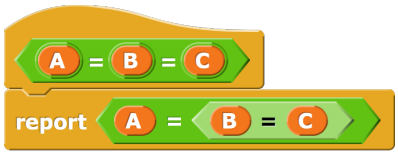
Question 8: We want to identify the *maximum value* in a list of one or more integers. Consider two versions of the algorithm below. Your job is to identify when they *won't work*. (select ALL that apply) 6 pts

The algorithm won't work correctly if…	Set a variable **`max`** to **`0`**. Iterate through the list of integer values. For each item, if a data value is greater than the value of the variable **`max`**, set **`max`** to the data value.	Set a variable **`max`** to the first data value. Iterate through the list's remaining values. For each item, if a data value is greater than the value of the variable **`max`**, set **`max`** to the data value.
…the maximum value is the *first value* in the list.	☐	☐
…the maximum value is *negative*.	☐	☐
…there are *any* negative values.	☐	☐

Question 9: What is the running time of the algorithm described in the right column? (select ALL that apply) 2pts

☐ Constant	☐ Logarithmic	☐ Linear	☐ Quadratic	☐ Exponential	☐ Reasonable Time	☐ Not Reasonable Time

Question 10: You write a block to determine whether three values are all equal (when they are, it should return **`true`**, otherwise **`false`**). You test it and it's fine:



Your friend thinks it *might* have a subtle bug. Choose the inputs that will reveal the bug (if possible), one in which your program returns **`true`** but should return **`false`**, and vice versa. (for each, select ONE per column, or if you believe that bug can't happen, choose the last row) 6pts

	Your program returns **`true`** but *should* return **`false`**			Your program returns **`false`** but *should* return **`true`**		
	A	B	C	A	B	C
3	○	○	○	○	○	○
4	○	○	○	○	○	○
5	○	○	○	○	○	○
false	○	○	○	○	○	○
true	○	○	○	○	○	○
Can't happen		○			○	

Question 11: We love our powerful list processing tools of map and keep! (This is an abstract visual representation so we can just focus on the blocks themselves, not the details of the inputs). For each of the following, which solution works using the fewest of these blocks? Note that there may have to be non-powerful blocks before and/or after calls to these 3 blocks, we only care about these 3 blocks. (select ONE per row) 4pts

Problem a: Given a list of temperatures in Fahrenheit, return a list of the equivalent temperatures in Celsius.
Problem b: Given a list of the money in the pockets of all the students, return the total amount.
Problem c: Given a list of words, return a list with them all sorted alphabetically.
Problem d: Given a list of words, return a list of the lengths of all the words that start with X.

	map	keep	map keep	keep map	None of these
a	○	○	○	○	○
b	○	○	○	○	○
c	○	○	○	○	○
d	○	○	○	○	○