

UC Berkeley's CS10 Fall 2018 Midterm 1: Instructor Prof. Dan Garcia

Your Name (first last)

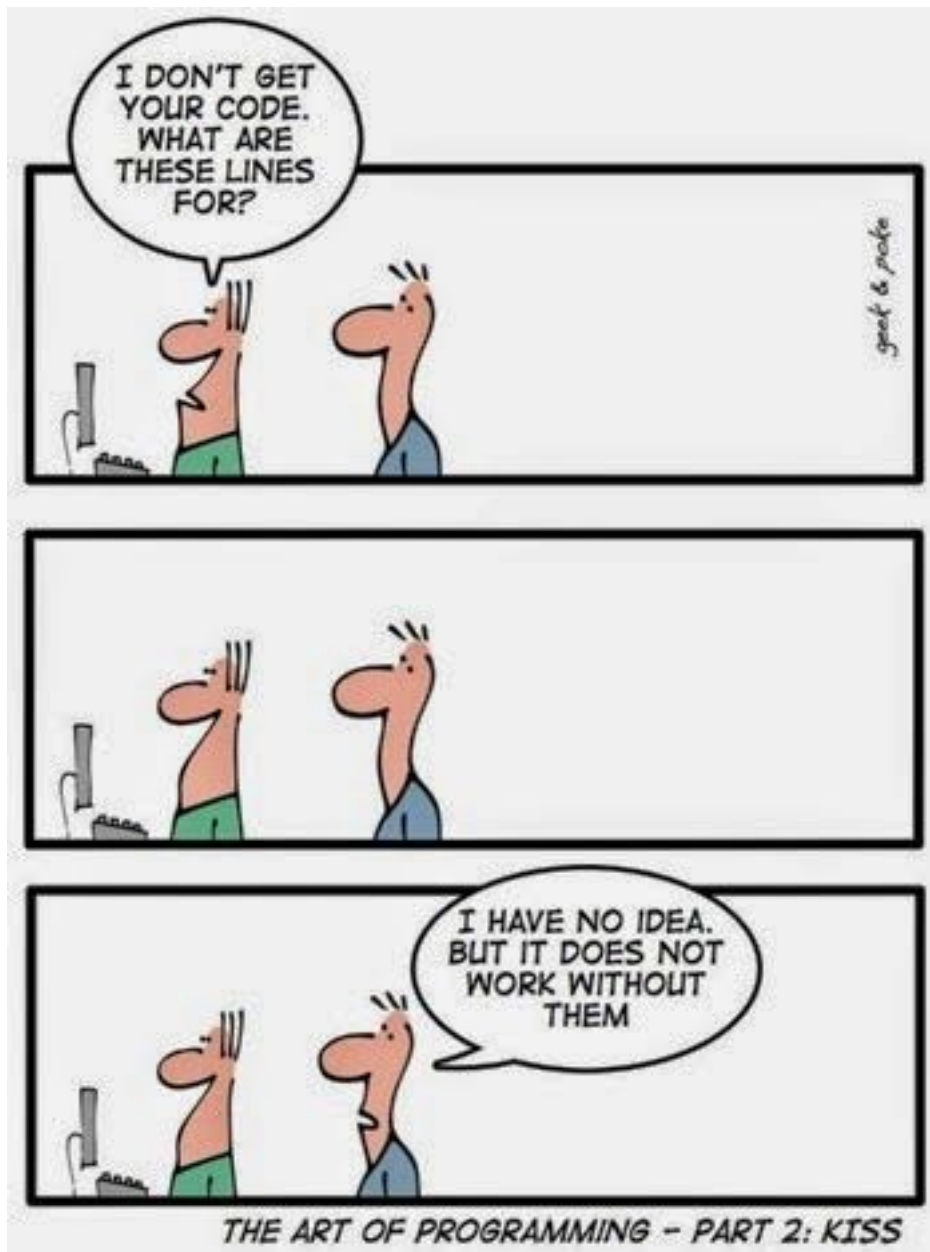
SID

Lab TA's Name

← _____
Name of person on left (or aisle)

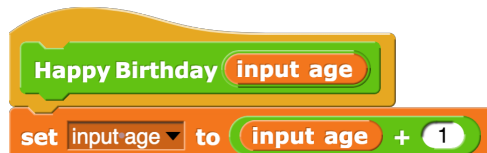
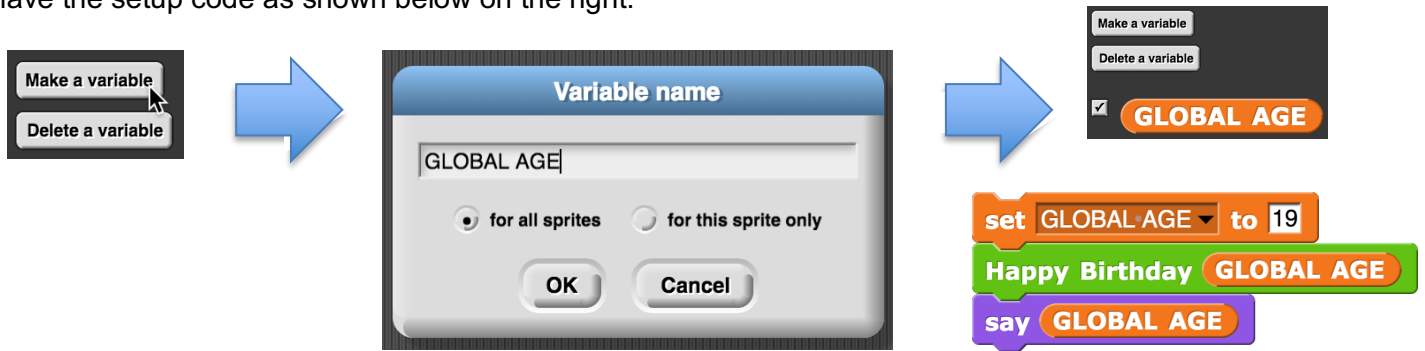
_____ →
Name of person on right (or aisle)

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



What's that Smell? Oh, it's Potpourri! (2 pts each for 1-6, low score dropped)

For questions 1 and 2, we make a global variable `GLOBAL AGE` by clicking the "Make a variable" button and have the setup code as shown below on the right.



Question 1: If `Happy Birthday` is `set input age to input age + 1`, what happens? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It says 19	It says 20	Error: "A variable named <code>input age</code> does not exist in this context"	Error: "A variable named <code>GLOBAL AGE</code> does not exist in this context"	It runs forever	None of these



Question 2: If `Happy Birthday` is `set input age to GLOBAL AGE + 1`, what happens? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It says 19	It says 20	Error: "A variable named <code>input age</code> does not exist in this context"	Error: "A variable named <code>GLOBAL AGE</code> does not exist in this context"	It runs forever	None of these

Question 3: Which is NOT a benefit of Massive Open Online Courses (MOOCs)? (select ONE)

- MOOCs vastly improved the collective educational resources that were available before they existed.
- MOOCs often emphasize lectures, where the real learning happens.
- MOOCs can feature the best teachers on the planet.
- MOOCs allow for learning for its own sake.
- None of these

Question 4: What is a true statement regarding abstraction? (select ONE)

- Snap! blocks can be *used* without worrying about their specifications.
- Snap! blocks can be *authored* without worrying about their specifications.
- Generalization in Snap! is embodied by the ability to hide HOW a block works from a user.
- Removal of detail in Snap! is embodied by input parameters so one solution solves many problems.
- None of these

Question 5: What can you conclude about the correctness of a reporter block with no inputs? (select ONE)

- If *it is guaranteed to be a function, and works once*, it will always work.
- If *it is not guaranteed to be a function, and works once*, it will always work.
- If *it is tested and works one million times*, it will always work.
- "Testing shows the presence, not the absence of bugs", so *no amount of testing can prove it'll always work*.
- None of these

Question 6: What true statement was shared in the Privacy lecture? (select ONE)

- The online world and the real world are different, so as long as your username doesn't tell anything about you, you don't put anything about yourself in your online "profile" (e.g., photo, address, etc), and what you post isn't connected to you, you can safely remain anonymous online.
- Thankfully, there are many entities (e.g., the government, your school, your employer, your bank, etc.) looking out for your privacy, so you don't have to actively maintain it.
- You can avoid having an information footprint simply by not going online and avoiding using digital devices.
- If you share something online accidentally, but quickly delete it, you still have control over that information.
- None of these

Question 7: All BUT item (Beavis: "Heh heh, he said 'but'...") (6 pts)

Snap! provides a block for picking an item from a list, but it doesn't provide a block for the opposite, returning a list *without* the item. Fill in the circles to complete the block.

Question 8: Match each programming paradigm with a problem best suited to it. (select ONE per row, 4 pts)

	Functional	Imperative	Object-Oriented	Declarative
Easily program 1,000 computers because reporter and predicate outputs are only due to inputs, not to any previous states	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Putting data in which can be queried later, like finding all your cousins from your family tree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drawing a complicated picture on the screen using pen up/down and move/turn commands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Authoring a role-playing game with different interacting creatures, like zombies & skeletons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 9: *What's our clearance, Clarence? What's our vector, Victor? Roger. Huh?* (10 pts) SID _____

Airlines feed their passengers in a unique way in first class. It begins with the single “first class steward” walking down the aisle, taking the meal orders by asking each passenger, one by one. Then the steward walks back to galley (mini-kitchen) at the front, prepares each meal one by one, and walks back and forth with a single tray for each passenger. When we say “steps”, we mean *physical steps that are walked*, like what your Fitbit would record. (By the way, none of the answers below depend on how many people [2 up to 8] are in each row)

Here's a fun random fact: As a boy, Gauss (the mathematician) came up with this: $1+2+\dots+N = \frac{N(N+1)}{2}$

a) How many (worst case) steps are needed to *take the orders* as a function of the number of passengers?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constant	Logarithmic	Linear	Quadratic	Cubic	Exponential

b) How many (worst case) steps are needed to *deliver the meals* as a function of the number of passengers?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constant	Logarithmic	Linear	Quadratic	Cubic	Exponential

c) Sometimes, when a passenger has been delivered a meal, they also ask for chopsticks, which are normally not put on the tray. In these cases, the steward has to return to the galley, pick up the chopsticks, deliver them, and then return to the galley to get the next passenger's meal. Now how many (worst case) steps are needed to *deliver the meals* as a function of the number of passengers?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constant	Logarithmic	Linear	Quadratic	Cubic	Exponential

d) Every person sitting on the window seat has the option of hitting the new electronic shutter which makes the window opaque (light can't go in or out) or clear. If you look at the windows of the plane from the outside, it looks like a binary number (clear = light = 1, opaque = dark = 0). How many different binary numbers can be made, as a function of the number of passengers?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constant	Logarithmic	Linear	Quadratic	Cubic	Exponential

e) Does the answer to question (a) change if instead they hire a second steward to help who starts from the back, with the idea that there is an identical galley in the back with the same food as in the front, and the stewards stop when they meet each other somewhere near the middle?

<input type="radio"/>	<input type="radio"/>
Yes	No