# UC Berkeley's CS10 Spring 2018 Midterm 1: Instructor Dan Garcia

Your Name (first last) SID Lab TA's Name Name of person on right (or aisle) >

← Name of person on left (or aisle)

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

# Question 1: Match each testing strategy with properties that describe it. (select ONE per row) 2 pts

	Unit	Regression	Integration	Black-box	Glass-box
Test as if you wrote it yourself and know insides	0	0	0	0	0
Test as if you have no idea what is inside	0	0	0	0	0
Test when you're putting it all together	0	0	0	0	0
Test your block in isolation according to spec	0	0	0	0	0
Run series of old tests after adding new feature	0	0	0	0	0



reports true, what can you say about A and B? (select ALL that apply) 3pts

A must be	A must be	A must be	A must be	в must be	в must be	None of these
equal to <b>B</b>	different from B	false	true	false	true	

...use this area for your scratch work, should you need it...



0	0	0	0
script variables (my age) set (my age to 19) Have Birthday (my age) say (my age) Have Birthday (age)	script variables (my age) set (my age) to 19 Have Birthday (my age) say age Have Birthday (age)	script variables my age set my age to 19 Have Birthday my age say my age Have Birthday age	None of these
set age to age +	set age to age + 1	set age to my age + 1	

...use this area for your scratch work, should you need it...

### Question 4: My name is Russell, I am a Wilderness Explorer... (10 pts=2+2+2+4) SID

Sometimes getting the most performance out of a parallel system is all about scheduling things to happen at the right time. Here's an example. A boy scout is supposed to walk four nice old ladies across a street. It takes the ladies **10**, **20**, **30**, and **50** seconds (respectively) to cross the street. Whenever two or more people are walking together, they have to walk at the speed of the slowest person in the group. It takes the boy scout only **1** second to walk back on his own. For all the calculations below, stop the timer the instant all four ladies have crossed; *don't count the time at the end it takes the boy scout to return back to his original side of the street*.

a) His scoutmaster has told him he can walk at most one person at a time. What's the fastest possible time to walk all the ladies across the street? (select ONE)



...use this area for your scratch work, should you need it...

b) His scoutmaster now tells him he can walk at most *two people* at a time, one on each arm. Remember, he needs to walk at the speed of the slowest person he's walking with.
 What's the fastest possible time to walk the all the ladies across the street? (select ONE)

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...use this area for your scratch work, should you need it...

c) What if instead there were two boy scouts who could each walk at most one person at a time. What's the fastest possible time to walk the all the ladies across the street? (select ONE)

Ο	0	Ο	Ο	Ο	Ο	Ο	0	0	Ο	Ο	0	Ο	Ο	0	Ο	Ο	0	0	Ο	0	Ο	Ο	Ο	Ο
41	42	43	44	51	52	53	54	61	62	63	64	71	72	73	74	81	82	83	84	111	112	113	114	115

...use this area for your scratch work, should you need it...

d) Assume the old ladies have very kind manners and whenever they think they know the age of someone, and that person is older than them, they tell the boy scout that they won't start crossing until the older person crosses first. The problem is that their memories aren't so crisp and their memory of who is older is a little shaky. What could this result in? (select ALL that apply)

Their preferences lead to the optimal crossing times	Their preferences lead to the <u>slowest possible</u> crossing times	Their preferences lead to it being impossible to get <u>all</u> of them across the street	Their preferences lead to it being impossible to get <u>any</u> of them across the street.

...use this area for your scratch work, should you need it...

#### Question 5: Take my midterm (iteratively and recursively), please! (6 pts=3+3) SID:

Helper Block	Description
Do one question	Do one question from the exam
No questions left	Return <b>true</b> if there are no questions left on the exam:



Given the two helper blocks above, show us how to take an exam, *iteratively* and recursively. Fill in the slot in the row and column corresponding to the block you'd like to place in the code (you might not need all rows and cols).



а	b	С	d	е		f	g	h	i	j
0	0	0	0	0	repeat	0	0	0	0	0
0	0	0	0	0	repeat until	0	0	0	0	0
0	0	0	0	0	for	0	0	0	0	0
0	0	0	0	0	for each	0	0	0	0	0
0	0	0	0	0	if	0	0	0	0	0
0	0	0	0	0	No questions left	0	0	0	0	0
0	0	0	0	0	not No questions left	0	0	0	0	0
0	0	0	0	0	Do one question	0	0	0	0	0
0	0	0	0	0	Take Midterm Iteratively	0	0	0	0	0
0	0	0	0	0	Take Midterm Recursively	0	0	0	0	0

## **Question 6: Dude, where's my card?** (6 pts = 4+2)

You have cards, numbered 1-N, which are shuffled (their order is scrambled), and placed into a list.

a) Fill in the circles to complete the block whose job is to report the index of a particular card in a shuffle.



