

# UC Berkeley's CS10 Fall 2016 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 each, 12 points per page)

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

We drop the lowest-scoring questions on this page...

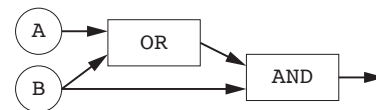
**Question 1:** Which is the *least correct* example of Abstraction, as we use in Computer Science? (select ONE)

- When creating a pedestrian foot traffic simulation, model each person as a single (x,y) point on the map.
- Writing down a *different* smoothie recipe for every fruit, even though the only difference is the fruit itself.
- Summarizing driving directions into "go a mile, left at the stadium" and not listing out every stop sign/light.
- Watching television, and not knowing (or caring) whether it came from a DVD, Bluray, cable or antennae.

**Question 2:** What is the correct order of the numbers:  $12_{16}$  (hex),  $1110_2$  (binary),  $13_{10}$  (decimal)? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
$12_{16} \leq 1110_2 \leq 13_{10}$	$12_{16} \leq 13_{10} \leq 1110_2$	$1110_2 \leq 13_{10} \leq 12_{16}$	$13_{10} \leq 1110_2 \leq 12_{16}$

Your friend finds an abstract way to represent Boolean expressions, shown on the right. It shows how the data flows from the variables A and B through the Boolean expressions and out. The figure is used for questions 3 and 4.



**Question 3:** Which Boolean expression does the figure model? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>A and A or B</b>	<b>A or A and B</b>	<b>B and A or B</b>	<b>B or A and B</b>

**Question 4:** If the output from the figure above is true, which can you say *for sure*? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A must be true	B must be true	Both A and B must be true	Nothing

**Question 5:** Which of the following is a *false statement* about Algorithms? (select ONE)

- Every algorithm can be constructed using only sequencing, selection and iteration.
- Given a particular problem, there is only one algorithm that can solve it.
- Knowledge of standard algorithms can help in developing new algorithms.
- Algorithms can be combined to make new algorithms.

**Question 6:** Which of the following is the most powerful programming paradigm? (select ALL that are the most powerful, there may be more than one; be sure to select at least one.)

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Functional	Imperative	Object Oriented	Declarative



**Question 7:** Given the following error-free expression , what do you know *for sure* about the *Domain* and *Range* of Foo? (select ALL that apply)

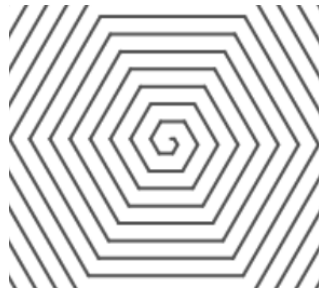
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Domain of Foo contains the number 42.	The Range of Foo is <i>exactly</i> numbers.	The Domain of Bar <i>contains</i> the range of Foo.	The Domain of Bar is <i>exactly</i> the range of Foo.

**Question 8: To everything, turn, turn, turn... (aka Squirrel revisited) (2 pts)**

SID: \_\_\_\_\_

```

Draw Spiral turn
for length = 1 to 1000
  move length steps
  turn turn degrees
    
```



The sprite starts in the center of the blank screen, and the user makes a call to Draw Spiral. We've zoomed in to the center to see the pretty pattern that was drawn.

What value of **turn** caused this pattern? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45	60	90	120

**Question 9,10,11: Aw, there's a zero in my list! Or not... (2 pts, 3 pts, 2 pts)**

Consider the **buggy** program on the right for determining whether there is a zero in a list of numbers:

What does the program *always return*? (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
true	false	true if there is a zero in the last element.	true if there is a zero in the first element.

```

Is there a zero in this list numbers ?
script variables found a zero!
set found a zero! to false
for each number of numbers
  set found a zero! to number = 0
report found a zero!
    
```

How could you fix the program so it works as intended? (select ONE)

- Remove `set found a zero! to false`
- Change `set found a zero! to false` to `set found a zero! to not number = 0`
- Change `set found a zero! to number = 0` to `set found a zero! to found a zero! or number = 0`
- Change `set found a zero! to number = 0` to `set found a zero! to found a zero! and number = 0`

What is the worst-case running time of the algorithm? (select ONE)

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

**Question 12, 13: Map, Keep and Combine, not necessarily in that order (2 pts each)**

For each of the following questions, indicate which of **map**, **keep**, and **combine** would be used to solve it most efficiently, and if more than one are used, in what order they are evaluated. (The computer runs inner procedures first.) For example, if you had to process a list by keeping only the numbers that are greater than 3

```

map 10 + over keep items such that > 3 from
    
```

and then adding 10 to each, you could use **map** and **keep**, evaluated in that order, because you first *filter* for the items greater than 3 and then add 10 to every *element* that abbreviated list.

Given a predicate function `word1 rhymes with word2 ?` that determines whether two words rhyme, return all the words of a list that rhyme with *Computing*. (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Only <b>map</b>	Only <b>keep</b>	First <b>map</b> , then <b>keep</b> .	First <b>keep</b> , then <b>map</b> .

Given a list of words and a function `value1 minimum value2` that reports the earlier of two values (words or numbers, etc.), return the word from a list that'd be first when listed in alphabetical order. (select ONE)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Only <b>map</b>	Only <b>combine</b>	First <b>map</b> , then <b>combine</b> .	First <b>combine</b> , then <b>map</b> .