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# CS 61A      Structure and Interpretation of Computer Programs

## Summer 2017

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QUIZ 8

### INSTRUCTIONS

- You have 10 minutes to complete this quiz.
- The exam is closed book, closed notes, closed computer, closed calculator.
- The final score for this quiz will be assigned based on **effort** rather than correctness.
- Mark your answers **on the exam itself**. We will *not* grade answers written on scratch paper.
- For multiple choice questions,
  - means mark **all options** that apply
  - means mark a **single choice**

Last name	
First name	
Student ID number	
CalCentral email (_@berkeley.edu)	
Teaching Assistant	<input type="radio"/> Alex Stennet <input type="radio"/> Kelly Chen <input type="radio"/> Angela Kwon <input type="radio"/> Michael Gibbes <input type="radio"/> Ashley Chien <input type="radio"/> Michelle Hwang <input type="radio"/> Joyce Luong <input type="radio"/> Mitas Ray <input type="radio"/> Karthik Bharathala <input type="radio"/> Rocky Duan <input type="radio"/> Kavi Gupta <input type="radio"/> Samantha Wong
Name of the person to your left	
Name of the person to your right	
<i>All the work on this exam is my own.</i> <b>(please sign)</b>	

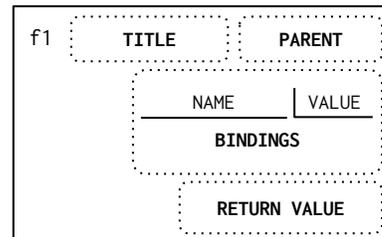
### 1. (5 points) All Summer Seventeen

- (a) On the next page, fill in the environment diagram that results from executing the code below until the entire program is finished, an error occurs, or all frames are filled.

*You may not need to use all of the spaces or frames.*

- (b) Then, for each region below, fill in the corresponding bubble. Leave a row blank if the space in the environment diagram should be left blank.

*To receive credit, you must list your bindings in the order in which they are first bound in the frame.*



FRAME	FIELD	NAMES	VALUES
	Binding 1	sum	func sum(lst) [parent=Global]
Global	Binding 2	<input type="radio"/> a	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 3	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Title	sum	
	Binding 1	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 2	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
f1	Binding 3	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 4	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 5	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Return		<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Title	<input type="radio"/> help <input type="radio"/> sum	
	Binding 1	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
f2	Binding 2	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 3	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Return		<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Title	<input type="radio"/> help <input type="radio"/> sum	
	Binding 1	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
f3	Binding 2	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 3	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Return		<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Title	<input type="radio"/> help <input type="radio"/> sum	
	Binding 1	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
f4	Binding 2	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Binding 3	<input type="radio"/> help <input type="radio"/> lst <input type="radio"/> me <input type="radio"/> total <input type="radio"/> you	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.
	Return		<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> None <input type="radio"/> $\alpha$ <input type="radio"/> fig.

**DO NOT TURN IN THIS PAGE.**

**Remember to fill out the choices on the previous page to receive credit for this quiz.**

A complete answer will:

- Add all missing names and parent annotations to all local frames.
- Add all missing values created or referenced during execution.
- Show the return value for each local frame.

```

1 def sum(lst):
2     total = 0
3     def help(you):
4         nonlocal total
5         total += lst[you]
6         lst[you] = total - lst[you]
7     me = 0
8     while me < len(lst):
9         help(me)
10        me += 1
11    return total
12
13 a = sum([6, 1])
    
```

Global

_____	sum	_____	→	func sum(lst) [parent=Global]
_____		_____		
_____		_____		

f1: \_\_\_\_\_ [parent=\_\_\_\_\_]

_____	_____
_____	_____
_____	_____
_____	_____
Return Value	_____

α func help(you) [parent=\_\_\_\_\_]

f2: \_\_\_\_\_ [parent=\_\_\_\_\_]

_____	_____
_____	_____
_____	_____
Return Value	_____

f3: \_\_\_\_\_ [parent=\_\_\_\_\_]

_____	_____
_____	_____
_____	_____
Return Value	_____

f4: \_\_\_\_\_ [parent=\_\_\_\_\_]

_____	_____
_____	_____
_____	_____
Return Value	_____