CS112 Spring 2014
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Exam 1

Do not open this exam until you are told. Read these instructions:

1. This is a closed book exam. No calculators, notes, or other aids are allowed. If you have a question during the exam, please come to the front of the class.
2. You must turn in your exam immediately when time is called at the end.
3. Four problems which add up to 45 points total. 60 minutes. Each question’s point value is indicated.
4. In order to be eligible for as much partial credit as possible, show all of your work for each problem, write legibly, and clearly indicate your answers. Credit cannot be given for illegible answers.

7. Fill in the following:

NAME :

G# :
For each of the following expressions, choose the VALUE that the expression simplifies or evaluates to. If it would be an error, choose ERROR. If multiple expressions or statements are given, give the value of the last expression in that set. All problems are independent. (17 points)

1. 5.0 + 1
   a. 6           b. 6.0           c. ERROR

2. 1.5 + 1
   a. 2           b. 3           c. 3.0           d. 2.5           e. ERROR

3. 7 // 2
   a. 3           b. 3.5         c. 3.0           d. ERROR

4. 0 % 3
   a. 0           b. 3           c. ERROR

5. "3" + 4
   a. 7           b. "7"         c. "34"         d. ERROR

6. int(1.5)
   a. 1.5         b. 1.0         c. 1           d. ERROR

7. "3" + str(4)
   a. "7"         b. "34"        c. 34           d. ERROR

8. list(range(3))
   a. [0,1,2]     b. [1,2,3]     c. [0,1,2,3]   d. [1,2,3,4]

9. len(())
   a. 0           b. 1           c. ERROR

10. len([[]])
    a. 1           b. 2           c. ERROR

11. lis = [1,2,3]
    lis[1] = 3
    lis
    a. [1,2,3]     b. [3,2,3]     c. [1,3,3]

12. lis = [1,2,3]
    lis[lis[1]] = 4
    lis
    a. [1,2,3]     b. [1,2,4]     c. [1,4,3]
13. \( x = 7 \)
\( x == x \)
  a. True  b. False  c. ERROR

14. \( y = "3" \)
\( y += "2" \)
  a. 32  b. 5  c. "32"  d. "5"  e. ERROR

15. type(1.0)
  a. integer  b. float  c. boolean  d. ERROR

16. type(5.0) == type(5)
  a. True  b. False  c. ERROR

17. True and not False
  a. True  b. False  c. ERROR
A. Trace through the following code using the scratch space below, and then write your answer in the box on the right-hand side. Then, TRANSFER YOUR ANSWER to the scantron sheet line-by-line. (5 points)

```python
numbers = [1,13,-1,0,7]
for elt in numbers:
    if elt < len(numbers):
        print ("True: " + str(numbers[elt+1]))
    else:
        if elt >= 0:
            print ("non-empty")
        elif elt == 0:
            print ("zero")
        else:
            print ("negator")
```

18. Output for line A1:
19. Output for line A2:
   a. True: 1  b. non-empty  c. zero  d. negator
20. Output for line A3:
21. Output for line A4:
22. Output for line A5:
   a. True: 1  b. non-empty  c. zero  d. negator

WILL NOT BE GRADED!
COPY TO SCANTRON!
B. Trace through the following code using the scratch space below, and then write your answer in the box on the right-hand side. Then, TRANSFER YOUR ANSWER to the scantron sheet line-by-line. (8 points)

done = 4
inside = [True]
ums = [1,2]
things = [0, 'cat', inside, nums]

for i in list(range(done)):
    if len(str(things[i])) < 3:
        print("short")
        if i < 2:
            nums[i] = nums[i] + 1
        else:
            print(things[i])
            inside[0] = not inside[0]

print(nums)

for elt in things:
    print(elt)

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B1_____________________________________________
B2_____________________________________________
B3_____________________________________________
B4_____________________________________________
B5_____________________________________________
B6_____________________________________________
B7_____________________________________________
B8_____________________________________________

23. Output for line B1:
a. 0       b. cat    c. short   d. [1, 2]
24. Output for line B2:
a. [True]  b. cat    c. [2, 3]   d. [1, 2]
25. Output for line B3:
a. [True]  b. cat    c. [2, 3]   d. [1, 2]
26. Output for line B4:
a. [True]  b. cat    c. [2, 3]   d. [1, 2]
27. Output for line B5:
a. 0       b. cat    c. short   d. [1, 2]   e. [2, 3]
28. Output for line B6:
a. 0       b. cat    c. [True]  d. [1, 2]   e. [2, 3]
29. Output for line B7:
a. 0       b. cat    c. [True]  d. [1, 2]   e. [2, 3]
30. Output for line B8:
a. 0       b. cat    c. [True]  d. [1, 2]   e. [2, 3]
C. Imagine that someone has written the following code for you, which asks the user to enter a list of arbitrary, unsorted integers, such as [5, 8, 3, 12], and stores this, as a list, in the variable `ints` below. Complete the code below to print the largest and second largest element of any arbitrary list passed in. You may assume the list is non-empty, and will only contain integers, but you may not make any other assumptions about the list. You may write your code in either version of Python; we have started it in the older version as a demonstration. (15 points)

YOU MAY NOT SORT THE LIST OR USE ANY BUILT IN FUNCTIONS (like `min`, `sort`, `max`, etc.) EXCEPT `str()` to print out the results.

Below are some sample runs:

Enter a list of ints, e.g. [4,5,6]: [8, 6, 81, 7, 2, 5]
largest: 81
next largest: 8

Enter a list of ints, e.g. [4,5,6]: [8]
largest: 8
next largest: 8

Please write your code below this line.
```
in ts = list(input("Enter a list of ints, e.g. [4,5,6]: "))

#your code below – you can use the back of this page for
test cases and scratch paper
```