CS 150: Intro to OOP, Fall 2008

First Midterm — September 29, 2008

Name:	Net ID:

1. This is a closed-everything exam. No notes or electronics of any kind are allowed.
2. Print your full name and your NetID in the boxes above.
3. Print your name at the top of every page.
4. Please write clearly and legibly. If I can't read your answer, I can't give you credit.

1. Consider the high level design of an AlarmClock class, which represents a typical alarm clock.

   (a) List at least 3 attributes which might be useful in representing the state of the clock. Make sure to state the purpose **and** the type of each attribute.

   (b) List at least 3 methods which might be supported by the clock. For each, clearly describe the action and how it affects the state, and explain any parameters or return values for the method.

2. Give the type and value of each of the following expressions.

   (a) range(20)[2]

   (b) (‘test’ < ’quiz’) or ((2 − 3) == 0)

   (c) int(‘256’) −250.5

   (d) len(range(40,50,2))

   (e) ‘CS150 test’[2:7]

3. Suppose we have a list, names. Each entry in names is a name (of type str), stored in the format ‘FirstName LastName’, e.g. ‘Abraham Lincoln’. Write a short program that will print the names in the format ‘LastName, FirstName’, e.g. ‘Lincoln, Abraham’, alphabetized by the *last* name.

4. Consider the following program:

```
x = int(raw_input(‘Enter a value for x: ’))
y = int(raw_input(‘Enter a value for y: ’))
if (x < 5):
   print ‘The answer is A’
elif (y > 6) and (x > 6):
   if x == 7:
         print ‘The answer is B’
   else:
         print ‘The answer is C’
else:
   print ‘The answer is D’
```

(a) Predict the output if the user enters 7 and then 8.

(b) Predict the output if the user enters 8 and then 11.

(c) Predict the output if the user enters 4 and then 7.

(d) Predict the output if the user enters 5 and then 2.

5. The following program has several errors in it. Identify at least 4.

```
names = list(Bob, Mary, Tom, George]
names.sort
for name in names
   name.reverse
   print names.lower()
print done
```

6. Write a program that prompts the user for an integer k, and then calculates and prints the factorial of k, defined as $k! = k \cdot (k-1) \cdot (k-2) \cdots 2 \cdot 1$.

7. Predict the output of the following program.

```
lower = 1
higher = 12
while (lower < higher):
   print lower + higher
   lower = lower + 1
   higher = higher − 1
```

8. Suppose we have two lists, called friends and family. Write a program that will output any names that appear on both lists.

   (You may assume that there are no repeats within a single list. So any name appears in friends at most one time and in family at most one time.)

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