

CS 115 Exam 1, Spring 2014

Your name: _____

Rules

- You may use one handwritten 8.5 x 11" cheat sheet (front and back). This is the only resource you may consult during this exam.
- Explain/show work if you want to receive partial credit for wrong answers.
- As long as your code is correct, you will get full credit. No points for style.
- When you write code, be sure that the indentation level of each statement is clear.

Grade (instructor use only)

	Your Score	Max Score
Problem 1		40
Problem 2		30
Problem 3		30
Total		100

Problem 1: Tracing code (40 points)

What will print to the screen when each of the following snippets of code is executed in IDLE?

Be very clear with spacing, line breaks, etc.

Note: the parts of this problem are *independent*.

(a)

```
a = 2
b = 5
c = 10
c += a
print(a, b, c)
```

(b)

```
x = 4 ** 2
y = x // 5 + 1
print(x, y)
```

(c)

```
for j in range(5):  
    print(j)
```

(d)

```
x = 1  
for i in range(3):  
    x = x * i  
    print(x)
```

(e)

```
q = 100  
if q < 2:  
    print("cat")  
elif q >= 0:  
    print("mouse")  
else:  
    print("dog")
```

```
(f) a = 4
    b = 10
    if a > 0 or b > 0:
        print("dog")
    if a > 0 and b > 0:
        print("cat")
    if not(a > 0):
        print("mouse")
```

```
(g) for i in range(4):
    for j in range(3):
        print(10 * j + i)
```

Problem 2: Short snippets of code (30 points)

Write snippets of code to do the following. Your code should only print the requested output. You will lose points for printing additional output.

You can assume that all your snippets are enclosed within a main function and that any necessary libraries have been imported. You only need to write the specific lines of code that accomplish each task.

Do not use `sys.exit()` in your solutions to this problem.

(a) The formula for the surface area of a sphere with radius r is

$$4 \pi r^2$$

Ask the user for the *surface area* of a sphere, and tell them the radius. You may assume that they enter a positive number.

(b) Ask the user to enter 1000 integers. You can assume that the user only enters valid integers.

After each integer, tell the user whether or not that integer is a multiple of 7. For example:

```
Enter an integer: 8
Not a multiple of 7
Enter an integer: 28
Multiple of 7
...etc.
```

- (c) Ask 200 students to enter their favorite TV show.
After all 200 students have entered their favorite shows, print the number of students who have the same favorite show as you do.

Problem 3: A complete program (30 points)

For this problem, you must write a **complete program**. That includes a docstring, a `def main()`, any necessary library imports, etc.

Read the instructions carefully before you start coding! If you get stuck, try to maximize your partial credit.

You can assume that all user inputs to this program are integers.

Your program should do the following:

1. Ask the user to enter the number of lab assignments in a class.
If that number is not positive, print an error message and exit the program immediately.
2. Prompt the user to enter each lab grade, using the assignment number (e.g. "Lab 4")
If a grade is not between 0 and 100, print an error message and exit the program immediately.
3. Once all the grades have been entered, print the following items:
 - The average (mean) grade
 - The maximum grade
 - If the user's grade never dropped from one lab to the next, congratulate them!
For example, if there are 5 lab grades, you should congratulate the user for the grades 90, 90, 90, 90, 90.
But you should do nothing for the grades 91, 92, 93, 85, 94 (since the user's Lab 4 grade slipped).

Here is just one example input/output sequence. The user's sample input is *italicized and underlined*, as usual. Your output should match the sample exactly for this input.

```
Number of labs: 3
```

```
--- Lab 1 ---
```

```
Grade: 70
```

```
--- Lab 2 ---
```

```
Grade: 80
```

```
--- Lab 3 ---
```

```
Grade: 90
```

```
Average: 80
```

```
Max: 90
```

```
Great job!
```

Write your Problem 3 code here.