CS 115 Exam 1, Section 2 Thu. 2/19/2015

Name: ____

Rules and Hints

- You may use one handwritten 8.5 × 11" cheat sheet (front and back). This is the only additional resource you may consult during this exam. *No calculators.*
- 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

Problem	**Your Score**	**Max Score**
Problem 1: Trace code		40
Problem 2: Trace and modify graphics code		15
Problem 3: Write snippets of code		15
Problem 4: Write a complete program		30
Total		100

Problem 1: Trace code (55 points)

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

Be very clear with spacing, line breaks, etc.

Treat each sub-problem as an independent question.

Problem 1A

```
x = 55
print(x, 'x')
```

Problem 1B

```
y = 10 * 3 ** 2 + 2
print(y + 1)
print(y)
```

Problem 1C

```
a = 9 % 2
b = 9 // 2
c = 9 / 2
print(a, b, c)
```

Problem 1D

```
s1 = 'Sonoma'
print(s1)
s2 = s1
s1 = 'State'
print(s1, s2)
```

Problem 1E

```
for i in range(6):
    print(i - 1)
```

Problem 1F

```
for i in range(1, 4):
    for j in range(3):
       print(i, j)
```

Problem 1G

```
x = 2
for i in range(10):
    x = x + 2
print(x)
```

Problem 1H

```
y = 12
if y < 12:
    print('P')
elif y != 12:
    print('Q')
else:
    print('R')
```

Problem 2: Trace and modify graphics code (15 points)

Problem 2A

The snippet of code below opens a graphics window and draws some rectangles in it. Note that, by default, rectangles are white with black outlines. Assume that the graphics library has been imported.

Sketch what the graphics window will look like at the end of the snippet.

```
window = GraphWin('Rectangles', 500, 500)
r1 = Rectangle(Point(0, 0), Point(50, 50))
r1.draw(window)
r2 = Rectangle(Point(0, 500), Point(50, 450))
r2.draw(window)
r3 = Rectangle(Point(500, 0), Point(450, 50))
r3.draw(window)
r4 = Rectangle(Point(500, 500), Point(450, 450))
r4.draw(window)
window.getMouse()
```

Problem 2B

Write a snippet of code (NOT a full program) that will draw another rectangle in the graphics window. This rectangle should have the same side length as the other 4, and it should be centered in the window.

Problem 3: Write snippets of code (15 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.

Problem 3A

Write a snippet of code that will ask the user for the number of miles they drove on a tank of gas and the number of gallons of gas they bought to refill it.

Then, print their *kilometers* per *liter*. Use these conversion formulas:

- 1 mile is 1.61 km
- 1 liter is 0.265 gallons

You can assume that the user enters positive numeric values.

Problem 3B

Write a snippet of code that will ask the user for their level of LDL (bad) cholesterol and report their risk level, as follows:

- Under 130: *low risk*
- At least 130 and below 160: *medium risk*
- At least 160 and below 190: *high risk*
- 190 or above: *very high risk*

You can assume that the user will enter a positive numeric value.

Problem 4: Write 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.

Your program should:

- Ask the user how many temperatures they will enter. You may assume they enter an integer. If this integer is not positive, print an error message and do not print any further output.

- Prompt the user for that many temperatures in Fahrenheit (F). Convert each temperature to Celsius using the following formula, where T is the Fahrenheit temperature: $(T - 32) * \frac{5}{9}$

- Print the average temperature in Celsius

- Print the number of temperatures that were below freezing (0 degrees Celsius)

- Print the maximum temperature in Celsius

Here is an example of what your program might do. User input is *italicized and underlined*.

```
Number of daily temperatures:  4
Enter a temperature (in F): 100
In Celsius:  37.77777777777778 degrees
Enter a temperature (in F): 20
In Celsius:  -6.666666666666667 degrees
Enter a temperature (in F): 10
In Celsius:  -12.222222222222221 degrees
Enter a temperature (in F): 62.5
16.944444444444443 degrees
Average temperature:  8.958333333333332 Celsius
2 temperatures below freezing
Maximum temperature:  37.77777777777778 Celsius
```

Problem 4, continued