Lehman College, CUNY   CMP 230 Exam 1– SAMPLE EXAM   Spring 2011

1. Write the python code that prompts the user for the area of a circle, and prints out the circumference.
   (Useful formulas: $area = \pi \cdot radius^2$, $circumference = 2 \cdot diameter \cdot \pi$)

2. Below is a fragment of a python program. After each line, indicate the current value of the variables and I and what is printed:

   (a) ```
mon = 5
tue = (mon + 6) % 2
```
   (b) ```
tue = tues + 3
wed = mon / 4
```
   (c) ```
thu = mon**2
wed = mon = tues
```
   (d) ```
thu = mon - 2*tue
tue = wed*mon
```
   (e) ```
mon, tue = tue, mon
```

3. Write the following formulas in python:

   (a) $x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$
   (b) $s = \frac{a+b+c}{2}$
   $area = \sqrt{s(s-a)(s-b)(s-c)}$

4. Using loops, write the following:

   (a) Multiply together all the numbers from 10 to 100:
   (b) Use a loop to calculate $3.145^{101}$:

5. Write a program that asks the user to click on a point on a screen. Your program should then draw a 2 by 2 rectangle around that point.

6. Using loops, write the following:

   (a) Print out the multiples of 5 from 205 to 305 inclusive.
   (Note the first thing printed will be 205 and the last thing printed will be 305.)
   (b) Rewrite the code below using loops:

   ```
Month 1 has 31 days.
Month 2 has 28 days.
Month 3 has 31 days.
Month 4 has 30 days.
Month 5 has 31 days.
Month 6 has 30 days.
Month 7 has 31 days.
Month 8 has 31 days.
Month 9 has 30 days.
Month 10 has 31 days.
Month 11 has 30 days.
Month 12 has 31 days.
```

7. Write the python code that prompts the user to click on three points. Connect the three selected points via line segments to form a triangle.

8. Write what is printed for the following:

   (a)
   ```
   f = 3
   s = 5
   for i in range(10,15):
       f,s = s, f + s
       print("f =",f," s=",s)
   ```
   (b)
   ```
   n = 3
   k = 4
   for c in range(5):
       n = n + k
       k = (3*k)
       print("n =",n," k = ", k)
   ```

9. Draw the output resulting from the following piece of code:

   ```
   from graphics import *

   def main():
       win = GraphWin()
       win.setCoords(0, 0, 100, 100)
       for n in range(10, 100, 10):
           Line(Point(n,0), Point(n,100)).draw(win)
       for n in range(10, 100, 10):
           Line(Point(0,n), Point(100,n)).draw(win)

       win.getMouse()

   main()
   ```

10. Write a **complete** program that, using a loop, asks the user for the number and cost of 10 items. The program should then print out the total cost.
    An example run of the program should look like:

    ```
    Enter number and cost of item 1, separated by a comma:   3,10
    Enter number and cost of item 2, separated by a comma:   10,2.3
    Enter number and cost of item 3, separated by a comma:   4,5
    Enter number and cost of item 4, separated by a comma:   1,20.20
    Enter number and cost of item 5, separated by a comma:   6,5.5
    Enter number and cost of item 6, separated by a comma:   11,3
    Enter number and cost of item 7, separated by a comma:   5,1
    Enter number and cost of item 8, separated by a comma:   1,12
    Enter number and cost of item 9, separated by a comma:   2,1.99
    Enter number and cost of item 10, separated by a comma:   4,5

    Your total cost is:   201.18
    ```