ECE-203 Programming for Engineers
Laboratory Experiment Week 3

Name: _____

In Lab Assignments (Due end of this lab session)

(10 Points) Let p be a bank's interest rate in percent per year (APR). An initial amount of money M will mature to the amount of

$$M\left(1+\frac{p}{100}\right)^n$$

after n years have passed. Write a Python program that computes how much $1,000 will have matured to after 5 years with an interest rate of 0.95% APR[1].

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(10 Points) Type up and run this short program intended to evaluate the expression

$$y = sin^2(x) + cos^2(x)$$

```
from math import sin, cos, pi

x = pi/4
1_val = sin^2(x) + cox^2(x)
print 1_VAL
```

Fix this program by identifying and correcting erroneous statements, syntax errors, etc.

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(10 Points) The following code attempts to solve the constant acceleration example we discussed in the second lecture

```
v0 = 3 m/s
t = 1 s
a = 2 m/s**2
d = v0*t + 1/2 a*t**2
print d
```

Again, fix this program by identifying and correcting erroneous statements, syntax errors, etc.

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[1] Look online – is this a good interest rate for a savings account in the current market?

(10 Points) The following code attempts to verify the equations

$$(a+b)^2 = a^2 + 2ab + b^2$$
$$(a-b)^2 = a^2 - 2ab + b^2$$

```
a = 3,3     b = 5,3
a2 = a**2
b2 = b**2

eq1_sum = a2 + 2ab + b2
eq2_sum = a2 - 2ab + b2

eq1_pow = (a + b)**2
eq22pow = (a - b)**2

print '1st equation: %g = %g', % (eq1_sum, eq1_pow)
print '2nd equation: %h = %h', % (eq2_pow, eq2_pow)
```

Again, fix this program by identifying and correcting erroneous statements, syntax errors, etc.

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(10 Points) Given the quadratic equation

$$ax^2 + bx + c = 0$$

the two roots are

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}, \quad x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}.$$

Identify the problem with the following program.

```
import math

a = 7
b = 26
c = 3

q = math.sqrt(b*b - 4*a*c)

x1 = (-b + q)/2a
x2 = (-b - q)/2a

print """
x1 = %g
x2 = %g
""" % (x1, x2)
```

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