

Part 1

August 2017

1. Write a program that prints out your full name.

```
print("your full name")
```

```
## your full name
```

2. Write a program that assigns the value 5 to a variable m representing mass and a value 10 to a variable v representing speed and then prints the kinetic energy.

```
m = 5
v = 10.
E = 0.5 * m * v ** 2
print("Energy = ",E," J")
```

```
## Energy = 250.0 J
```

3. What will be the value of the expression $(2.0 + 3*(1/2)) / 5$? Type this expression into the Python shell to verify your answer (Python will give you an answer that is off by a very small amount; ignore this). Now type this expression into your calculator. Why do we get a different answer than the one you predicted? (If you don't get a different answer, congratulations, you're probably using Python 3!)

```
python2=0.4
python3=0.7
calculator=0.7
```

4. Without running the code, determine the output of this program:

```
x = 5
y = x
x += 1
print(y)
x = y
print(x)
y += x
x -= y
print(x, y)
```

```
## 5
## 5
## -5 10
```

Now run the code to verify your answer.

5. Write a program that prints a four by four matrix of x's. It should look like:

```
*   *   *   *
*   *   *   *
*   *   *   *
*   *   *   *
```

```
print("\t*\t*\t*\t*");
print("\t*\t*\t*\t*");
print("\t*\t*\t*\t*");
print("\t*\t*\t*\t*");
```

```
## * * * *
```

```
## * * * *
## * * * *
## * * * *
```

You may find the '\t' character useful. What does it do?

6. Write a program that switches the values of two variables x and y (when you define the variables, you may assign any values you want to them in order for the program to compile, but you may not use these values anywhere else in the program). Note $x=y$, $y=x$ will not work (why?).
7. Give the type and value of the result of each expression or state when an error occurs:

a. $13 - 5$

```
## 8
```

b. $2.2 + 0.8$

```
## 3.0
```

c. $5 * 4$

```
## 20
```

d. $5.0 * 4$

```
## 20.0
```

e. $12 // 3$

```
## 4
```

f. $12.0 / 3$

```
## 4.0
```

g. $5 * 'a'$

```
## aaaaa
```

h. $'a' + 'b'$

```
## ab
```

i. $'a' + 1$

```
## This is a type error, you're trying to add a string to a number
```

j. $5 \% 2$

```
## 1
```

k. $4 \% 7$

```
## 4
```

l. $-4 \% 7$

```
## 3
```

m. $(1 + 2) * ('a' + 'b')$

```
## ababab
```

n. $'ab' - 'b'$

```
## This is an error, Python doesn't know how to subtract strings
```

o. $5 / 0$

```
## This is a divide by zero error.
```