Midterm

Name:_____ abc123:_____

1. (10 Pts) What is the output of the following Python programs? If the execution fails at run-time, write the output up until the failure happens, then write FAIL.

PROGRAM A

```
x = 5
y = x + 3
x = x - 1
z = 10
x = x + z
print('x: {}, y: {}, z: {}'.format(x, y, z))
```

_____

PROGRAM B

```
for z in [2, 4, 7, 9]:
    print(z - 1)
```

_____

PROGRAM C

```
nums = list()
for i in range(4):
   nums.append(2*i)
print(nums)
print(nums[4])
```

_____

PROGRAM D

```
words = ['A', 'short', 'list']
print(len(words))
for s in words:
    print(len(s))
```

_____

PROGRAM E

```
s = 'Y'
while len(s) < 3:
    s = 2*s
    print(s)
```

2. (10 Pts) What is the output of the following Python programs?

prob1.txt

```
Hello
Mom
```

PROGRAM A

```
fin = open('prob1.txt', 'r')
s = fin.read()
print(s.upper())
```

PROGRAM B

```
def foo(x):
    return x + 3
def bar(a, n):
    print(a*n)

print(foo(7))
bar('x', 4)
bar(foo(2), 6)
```

3. (5 Pts) What will be the contents of the file prob2.txt? Indicate any blanks or newlines clearly.

```
fout = open('prob2.txt', 'w')
words = ['Hello', 'there', 'Mom']
for w in words:
    fout.write(w)
fout.close()
```

4. (5 Pts) What will be printed by the function calls in parts a-d?

```
def comp(x):
    if x < 3:
        print("A")
    elif x > 10:
        print("B")
    else:
        print("C")
```

a. comp(5) b. comp(12) c. comp(-2) d. comp(10)

5. (10 Pts) Select all the strings that fully match the regular expression: [^dp]an

☐ Dan ☐ pan ☐ fan ☐ man ☐ None of the above

Select all the strings that fully match the regular expression: <[a-z]*@[A-Za-z0-9]+.edu>

☐ <anthony.rios@utsa.edu>

☐ <@utsa$edu>

☐ <anthonyrios@utsa#edu>

☐ <anthonyrios@.edu>

☐ None of the above strings match

Select all the strings that fully match the regular expression: ^Go.*

☐ Way to ^Go!

☐ Go Bengals!

☐ go trees?

☐ None of the above strings match

4. **(5 points):** Using the contingency table below, calculate the overserved agreement for Cohen's Kappa (Po is the probability that the two annotators agree) – I will accept fractions. Is the observed agreement a good measure of annotator quality? Why or why not? Hint: Po = P(Rater 1 = Rater 2)

		Rater 1	
		Y	**N**
Rater 2	**Y**	2	3
	N	3	22

5. (10 Pts) Complete the function definition.

CODE: myCode.py

```
def numbersBetween(numList, lowVal, highVal):
    '''Print on one line the numbers in numList that lie in the
          interval from lowVal to highVal, allowing lowVal and highVal
    For example,
      numbersBetween([2, 5, 1], 3, 5) prints:  5
      numbersBetween([2, 5, 1, 7, 4], 2, 6) prints:  2 5 4       '''
```

6. (5 Pts) Modify the previous problem to print nothing, but put the selected numbers in a list, and return the list.

CODE: myCode.py

```
def numbersBetween(numList, lowVal, highVal):
```

7. **(5 Pts)** Compute the dot product (i.e., vector vector/inner product) between the following two vectors (show your work):

$$u = \begin{bmatrix} 3 \\ -4 \end{bmatrix} \quad v = \begin{bmatrix} 7 \\ -8 \end{bmatrix}$$

8. **(5 Pts)** What is the value of AB (i.e., matrix-matrix multiplication)? If you show some work, I can give partial credit.

$$A = \begin{bmatrix} 1 & 3 & 2 \\ 1 & -1 & 2 \\ -2 & 0 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 3 & -2 \\ 1 & -1 & 1 \\ 0 & 2 & 0 \end{bmatrix}$$

EXTRA CREDIT (5 Pts) Complete the code for the following function so it matches its documentation:

FILE: example.py

```
def doublesBelow(n, tooBig):
    '''Keep printing and doubling n, as long as the result is
       less than tooBig. For example, doublesBelow(5, 25) would print
       5 10 20 '''
```