ANSWER KEY Lehman College, CUNY
CIS 166 & CMP 230 Exam 2, Version 1, Fall 2012

1. What will the following code print:

```
storms = "AlbertoXBerylXChrisXDebbyXErnestoXFlorenceXGordonXHelene"
print(storms[0], storms[1], storms[-1])
num = storms.count("X") + 1
names = storms.split("X")
print("The first", num, "storms are", names)
message = names[-1].lower()
print(message[0:3], "p!!!")
```

Output:

```
A l e
The first 8 storms are ['Alberto', 'Beryl', 'Chris', 'Debby', 'Ernesto', 'Florence',
'Gordon', 'Helene']
hel p!!!
```

2. Write a **function** that takes as a string of words separated by commas and returns a list of the words in upper case.

```
def p2v1(myString):
    s = myString.upper()
    return(s.split(","))
```

3. What will the following code print:

(a)
```
for i in [0,2,4,8,9]:
    j = (i+5)%10
    print(i,j)
```

Output:

```
0 5
2 7
4 9
8 3
9 4
```

(b)
```
s = "windy"
for i in s:
    n = ord('a')+(ord(i)-ord('a')+3)%26
    print(i,chr(n))
```

Output:

```
w z
i l
n q
d g
y b
```

4. What will the following program print:

```
def first():
    print()
    print("And when ", end="")
def repeat(dir):
    print("they were",dir, end=" ")
    return(1)
def verse(dir):
    first()
    return (repeat(dir)+ repeat(dir))
def end():
    first()
    print("they were only half-way up,")
    print("They were neither up nor down")
    print()
def mainVersion1():
    count = verse("up")
    count = count + verse("down")
    end()
    print("Number of repeats is", count)
mainVersion1()
```

Output:

```
And when they were up they were up
And when they were down they were down
And when they were only half-way up,
They were neither up nor down

Number of repeats is 4
```

5. Fill in the missing function definitions for this program:

```
def main():
    welcome()               #Prints "Welcome" to the screen
    x,y,z = userInput()     #Asks user for 3 inputs and returns numbers entered
    d = calculate(x,y,z)    #Returns the sum of the parameters
    displayResults(d)       #Prints the result to the screen
main()
```

(That is, write the functions `welcome()`, `userInput()`, `calculate()` and `displayResults()`.)

```
def welcome():
    print("Welcome")
def userInput():
    a,b,c = eval(input("Enter 3 numbers, separated by commas: "))
    return(a,b,c)
def calculate(a,b,c):
    return (a+b+c)
def displayResults(d):
    print("Result: ", d)
```

6. What is returned when the function is invoked on the inputs below:

```
def mystery(s1):
    n = s1.count(" ")
    total = 1
```

```
    for i in range(1,n):
        total = total*i
    return(total)
```

(a) `mystery("what does this do?")` **Return:** 2

(b) `mystery("mystery, mystery?")` **Return:** 1

(c) `mystery("I know, I know, I know!")` **Return:** 24

7. What will the following code print:

```
nums = [1,2,10,20,2,1]
m = 0
M = 0
for i in range(0,len(nums),2):
    m = m + nums[i]
    M = M + nums[i+1]
    print(m,M)
```

Output:

```
1 2
11 22
13 23
```

8. Write a function that takes as a parameter a list of strings and returns a list containing the first letter of each of the strings. That is, if the input parameter is ["This", "is", "an", "Example"], your function should return ["T", "i", "a", "E"].

```
def firstLetter(myList):
    newList = []
    for  s in myList:
        newList.append(s[0])
    return(newList)
```

9. Given the following program and input file, what is printed:

```
def main():
    infile=open("in.txt","r")
    for line in infile.readlines():
        print(line)
        print(line.title())
    infile.close()
main()
```

in.txt

```
You must write,
and read,
as if your life
depended on it.
```

Output:

```
You must write,

You Must Write,

and read,

And Read,

as if your life

As If Your Life

depended on it

Depended On It
```

10. Write a **program** that reads in a text file, `infile.txt`, and writes out the contents to another file, `outfile.txt`, in all upper case.

```
def main():
    infile = open("in.txt", "r")
```

```
    outfile = open("outfile.txt", "w")
    for line in infile.readlines():
        print(line.upper().rstrip(), file = outfile)
    infile.close()
    outfile.close()
main()
```

1. What will the following code print:

```
storms = "AndreaYBarryYChantalYDeanYErinYFelixYGabrielleYHumberto"
print(storms[0], storms[1], storms[-1])
num = storms.count("Y") + 1
names = storms.split("Y")
print("The first", num, "storms are", names)
message = names[5].upper()
print("H", message[1:3], "P!!!")
```

Output:

```
A n o
The first 8 storms are ['Andrea', 'Barry', 'Chantal', 'Dean', 'Erin', 'Felix',
'Gabrielle', 'Humberto']
H EL P!!!
```

2. Write a **function** that takes as a string of words separated by commas and returns a list of the words in lower case.

```
def p2v2(myString):
    s = myString.lower()
    return(s.split(":"))
```

3. What will the following code print:

(a)
```
for i in [0,1,3,7,9]:
    j = (i+5)%10
    print(i,j)
```

Output:

```
0 5
1 6
3 8
7 2
9 4
```

(b)
```
s = "wanda"
for i in s:
    n = ord('a')+(ord(i)-ord('a')-1)%26
    print(i,chr(n))
```

Output:

```
w v
a z
n m
d c
a z
```

4. What will the following program print:

```
def first():
    print("Hickory, dickory, dock")
def repeat(dir):
    print("The mouse ran",dir)
    return(1)
def verse(n):
    print("The clock struck", n)
def mainVersion2():
    first()
    count = repeat("up the clock")
    verse(1)
    count = count + repeat("ran down")
    first()
    print()
    print("Number of repeats is", count)

mainVersion2()
```

Output:

```
Hickory, dickory, dock
The mouse ran up the clock
The clock struck 1
The mouse ran ran down
Hickory, dickory, dock

Number of repeats is 2
```

5. Fill in the missing function definitions for this program:

```
def main():
    welcome()               #Prints "My program" to the screen
    x,y,z = userInput()     #Asks user for 3 inputs and returns numbers entered
    d = calculate(x,y,z)    #Returns the sum of the parameters
    displayResults(d)       #Prints the result to the screen
main()
```

(That is, write the functions `welcome()`, `userInput()`, `calculate()` and `displayResults()`.)

```
def welcome():
    print("My Program")
def userInput():
    a,b,c = eval(input("Enter 3 numbers, separated by commas: "))
    return(a,b,c)
def calculate(a,b,c):
    return (a+b+c)
def displayResults(d):
    print("Result: ", d)
```

6. What is returned when the function is invoked on the inputs below:

```
def mystery(s1):
    n = s1.count(" ")
    total = 0
    for i in range(1,n):
        total = total+i
    return(total)
```

(a) `mystery("what does this do?")` **Return:** 3

(b) `mystery("mystery, mystery?")` **Return:** 0

(c) `mystery("I know, I know, I know!")` **Return:** 10

7. What will the following code print:

```
nums = [1,1,9,8,1,2]
m = 0
M = 0
for i in range(0,len(nums),2):
    m = m + nums[i]
    M = M + nums[i+1]
    print(m,M)
```

Output:

```
1 1
10 9
11 11
```

8. Write a function that takes as a parameter a list of strings and returns a list containing the first letter of each of the strings. That is, if the input parameter is ["This", "is", "an", "Example"], your function should return ["T", "i", "a", "E"].

```
def firstLetter(myList):
    newList = []
    for  s in myList:
        newList.append(s[0])
    return(newList)
```

9. Given the following program and input file, what is printed:

```
def main():
    infile=open("in.txt","r")
    for line in infile.readlines():
        print(line)
        print(line.capitalize())
    infile.close()
main()
```

in.txt

```
You must write,
and read,
as if your life
depended on it.
```

Output:

```
You must write,

You must write,

and read,

And read,

as if your life

As if your life

depended on it

Depended on it
```

10. Write a **program** that reads in a text file, `infile.txt` and writes out the contents to another file, `outfile.txt`, all in lower case.

```
def main():
    infile = open("in.txt", "r")
    outfile = open("outfile.txt", "w")
    for line in infile.readlines():
        print(line.lower().rstrip(), file = outfile)
    infile.close()
    outfile.close()
main()
```

1. What will the following code print:

```
storms = "ArthurZBerthaZCristobalZDollyZEdouardZFayZGustavZHanna"
print(storms[0], storms[1], storms[-1])
num = storms.count("Z") + 1
names = storms.split("Z")
print("The first", num, "storms are", names)
message = names[3].upper()
print("HE", message[2:4], "P!!!")
```

Output:

```
A r  a
The first 8 storms are ['Arthur', 'Bertha', 'Cristobal', 'Dolly', 'Edouard', 'Fay',
'Gustav', 'Hanna ']
HE LL P!!!
```

2. Write a **function** that takes as a string of words separated by commas and returns a list of the words in upper case.

```
def p2v3(myString):
    s = myString.upper()
    return(s.split(";"))
```

3. What will the following code print:

(a)
```
for i in [2,4,6,8,9]:
    j = (i+4)%10
    print(i,j)
```

Output:

```
2 6
4 8
6 0
8 2
9 3
```

(b)
```
s = "wilma"
for i in s:
    n = ord('a')+(ord(i)-ord('a')-1)%26
    print(i,chr(n))
```

Output:

```
w v
i h
l k
m l
a z
```

4. What will the following program print:

```
def first():
    print("Calico pie\nThe little Birds fly...")
def repeat(dir):
    print("They never came", dir)
    return(1)
def verse():
    count = repeat("back to me") + repeat("back")
    count = count + repeat("back")
    count = count + repeat("back to me!")
    return(count)
def mainVersion3():
    first()
    print("Till away they flew,--")
    count = verse()
    print()
    print("Number of repeats is", count)

mainVersion3()
```

Output:

```
Calico pie
The little Birds fly...
Till away they flew,--
They never came back to me
They never came back
They never came back
They never came back to me!

Number of repeats is 4
```

5. Fill in the missing function definitions for this program:

```
def main():
    welcome()             #Prints "Welcome" to the screen
    s,t = userInput()     #Asks user for 2 STRINGS and returns them
    l = calculate(s,t)    #Returns the sum of the lengths of the strings
    displayResults(l)     #Prints l to the screen
main()
```

(That is, write the functions `welcome()`, `userInput()`, `calculate()` and `displayResults()`.)

```
def welcome():
    print("Welcome")
def userInput():
    a,b,c = eval(input("Enter 3 numbers, separated by commas: "))
    return(a,b,c)
def calculate(a,b,c):
    return (a+b+c)
def displayResults(d):
    print("Result: ", d)
```

6. What is returned when the function is invoked on the inputs below:

```
def mystery(s1):
    n = s1.count(" ")
```

```
    total = 1
    for i in range(1,n):
        total = total*i
    return(total)
```

(a) `mystery("why, o why, why?")` **Return:** 2

(b) `mystery("very lost")` **Return:** 1

(c) `mystery("I am, you are, we are!")` **Return:** 24

7. What will the following code print:

```
nums = [2,1,8,8,1,2]
m = 0
M = 0
for i in range(0,len(nums),2):
    m = m + nums[i]
    M = M + nums[i+1]
    print(m,M)
```

Output:

```
2 1
10 9
11 11
```

8. Write a function that takes as a parameter a list of strings and returns a list containing the length of each of the strings. That is, if the input parameter is ["This", "is", "an", "Example"], your function should return [4, 2, 2, 7].

```
def lengths(myList):
    newList = []
    for  s in myList:
        newList.append(len(s))
    return(newList)
```

9. Given the following program and input file, what is printed:

```
def main():
    infile=open("in.txt","r")
    for line in infile.readlines():
        print(line)
        print(line.title())
    infile.close()
main()
```

in.txt

```
Lying is done
with words
and also
with silence
```

Output:

```
Lying is done

Lying Is Done

with words

With Words

and also

And Also

with silence

With Silence
```

10. Write a **program** that reads in a text file, `infile.txt` and writes out the contents to another file, `outfile.txt`, all in lower case.

```
 def main():
    infile = open("in.txt", "r")
    outfile = open("outfile.txt", "w")
    for line in infile.readlines():
        print(line.lower().rstrip(), file = outfile)
    infile.close()
    outfile.close()
main()
```

1. What will the following code print:

```
storms = "AnaWBillWClaudetteWDannyWErikaWFredWGraceWHenri"
names = storms.split("W")
print(storms[0], storms[1], storms[-1])
num = storms.count("W") + 1
names = storms.split("W")
print("The first", num, "storms are", names)
message = names[-1].lower()
print(message[0:2], "lp!!!")
```

Output:

```
A n i
The first 8 storms are ['Ana', 'Bill', 'Claudette', 'Danny', 'Erika', 'Fred',
'Grace', 'Henri']
he lp!!!
```

2. Write a **function** that takes as a string of words separated by commas and returns a list of the words.

```
def p2v4(myString):
    s = myString.lower()
    return(s.split("$"))
```

3. What will the following code print:

(a)
```
for i in [0,2,4,8,9]:
    j = (i+4)%10
    print(i,j)
```

Output:

```
0 4
2 6
4 8
8 2
9 3
```

(b)
```
s = "wendy"
for i in s:
    n = ord('a')+(ord(i)-ord('a')+3)%26
    print(i,chr(n))
```

Output:

```
w z
e h
n q
d g
y b
```

4. What will the following program print:

```
def repeat(dir):
    print("Jack", dir)
    return(1)
def verse1():
    count = repeat("be Nimble")
    count = count + repeat("be quick")
    count = count + repeat("jump over")
    return(count)
def verse2():
    count = repeat("jumped high")
    count = count + repeat("jumped low")
    count = count + repeat("jumped over")
    return(count)
def mainVersion4():
    count = verse1()
    print("The candlestick")
    count = count + verse2()
    print("and burned his toe")
    print()
    print("Number of repeats is", count)

mainVersion4()
```

Output:

```
Jack be Nimble
Jack be quick
Jack jump over
The candlestick
Jack jumped high
Jack jumped low
Jack jumped over
and burned his toe

Number of repeats is 6
```

5. Fill in the missing function definitions for this program:

```
def main():
    welcome()             #Prints "My Program" to the screen
    s,t = userInput()     #Asks user for 2 STRINGS and returns them
    l = calculate(s,t)    #Returns the sum of the lengths of the strings
    displayResults(l)     #Prints l to the screen
main()
```

(That is, write the functions `welcome()`, `userInput()`, `calculate()` and `displayResults()`.)

```
def welcome():
    print("My Program")
def userInput():
    a,b,c = eval(input("Enter 3 numbers, separated by commas: "))
    return(a,b,c)
def calculate(a,b,c):
    return (a+b+c)
def displayResults(d):
    print("Result: ", d)
```

6. What is returned when the function is invoked on the inputs below:

```
def mystery(s1):
    n = s1.count(" ")
    total = 0
    for i in range(1,n):
        total = total+i
    return(total)
```

(a) `mystery("why, o why, why?")` **Return:** 3

(b) `mystery("very lost")` **Return:** 0

(c) `mystery("I am, you are, we are!")` **Return:** 10

7. What will the following code print:

```
nums = [2,1,20,10,2,1]
m = 0
M = 0
for i in range(0,len(nums),2):
    m = m + nums[i]
    M = M + nums[i+1]
    print(m,M)
```

Output:

```
2 1
22 11
24 12
```

8. Write a function that takes as a parameter a list of strings and returns a list containing the length of each of the strings. That is, if the input parameter is ["This", "is", "an", "Example"], your function should return [4, 2, 2, 7].

```
def lengths(myList):
    newList = []
    for  s in myList:
        newList.append(len(s))
    return(newList)
```

9. Given the following program and input file, what is printed:

```
def main():
    infile=open("in.txt","r")
    for line in infile.readlines():
        print(line)
        print(line.capitalize())
    infile.close()
main()
```

in.txt

```
Lying is done
with words
and also
with silence
```

Output:

```
Lying is done

Lying is done

with words

With words

and also

And also

with silence

With silence
```

10. Write a **program** that reads in a text file, `infile.txt`, and writes out the contents to another file, `outfile.txt`, in all upper case.

```
def main():
    infile = open("in.txt", "r")
    outfile = open("outfile.txt", "w")
    for line in infile.readlines():
        print(line.upper().rstrip(), file = outfile)
    infile.close()
    outfile.close()
main()
```