Name: (as it would appear on official course roster)	Shravan Sharath Shenoy
UCSB email address:	shravansharathshenoy **@ucsb.edu**
Lab Section:	Monday 9:00 AM
Optional: name you wish to be called if different from above	–
Optional: name of "homework buddy" (leaving this blank signifies "I worked alone")	–

h04: Loops 1

Assigned: Tuesday, April 23rd, 2019
Due: Tuesday, April 30th, 2019
Points: 100

- You may collaborate on this homework with AT MOST one person, an optional "homework buddy". MAY ONLY BE TURNED IN THE LECTURE LISTED ABOVE AS THE DUE DATE. There is NO MAKEUP for missed assignments; in place of that, we drop the single lowest score (if you a zero, that is the lowest score.)
- **IMPORTANT**: When submitting this homework:
  - **DO NOT USE STAPLES**
  - WRITE YOUR **NAME ON EACH PAGE** IN THE SPACE PROVIDED
  - USE DARK INK PENS – PLEASE **DO NOT USE PENCIL**
  - PRINT THIS HOMEWORK **DOUBLE-SIDED** PLEASE!
- **REMEMBER**: If you use code/techniques we have not learned in class, you will **NOT** get credit!

READING ASSIGNMENT: Read Chapter 5 in Perkovic, review your lecture slides/notes. Then complete these problems.

1. (5 pts) For the Python code in the left box, write the output in the right box:

`colors = ["red","green","blue"]`
`for c in colors:`
`  print(c)`
	red
	green
	blue

`fruits = ["apple","banana","pear","grape"]`
`for i in range(4):`
`  print(i,fruits[i],sep=",")`
	0, apple
	1, banana
	2, pear
	3, grape

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2. (20 pts) p. 129 in the textbook shows a function definition for a multi-way if/else that prints a message depending on the temperature.

   Rewrite this function so that instead of printing a message, it returns a letter grade (e.g. `return 'A'`) instead of `print('It is hot')` based on the integer parameter. If the grade is 90 or above, return an 'A'. If it is 60 or higher, but less than 90, return a 'C', and if it is less than 60, return an 'F'. (In real life, there would be Bs and Ds, but this is just an exercise.)

   NOTE: Be careful about the fact that in an `if/elif/else`, some of the relationships are implicit. You cannot get to the `elif` unless the condition on the first `if` is false. So you should not check for that a second time. (To be more clear: the `elif` on p. 129 says: `elif t > 32:` rather than `if t <= 86 and t > 32`. The `t<=86` part is unnecessary, because we would never even get to the `elif` unless `t<=86` were true. Make sure you keep this in mind as you write your code for this problem. Points may be deducted if you do redundant checks, even if the code "works".)

```
def gradeprinter(t)
    if t >= 90:
        return ('A')
elif t >= 60:
        return ('C')
else:
        return ('F')
```

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3. (15 pts) Write a function definition, **`CheckIt(x, a, b)`**, that takes in 3 integers, **x**, **a**, and **b**, checks to see if **x** lies between the values of **a** and **b** (inclusive of **a** and **b**), and returns the Boolean value **`True`** if that is true, otherwise it returns **`False`**.

```
def CheckIt(x, a, b):
    if (x in range(a,b+1)) == True:
        print (True)
    else:
        print (False)
```

4. (10 pts) Try out this code on IDLE, describe / explain what it does:

```
import turtle
t = turtle.Turtle()
for a in range(6):
    t.circle(100)
    t.right(60)
```

The code above imports turtle graphics and creates 6 circles, all 100 pixels long, while moving consistently to the right of the window at a 60° angle.

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5. (20 pts) Write a Python function, **`MyFunction()`**, that asks the user for a positive, non-zero, integer input and prints a countdown, in ones, from that integer to zero. The function MUST CHECK to see if the user DID put in a positive, non-zero, number, although it can assume that the input is an integer. You MUST use a **`while`** loop in this program to get *any* credit. Here's an example run. The bolded parts are what the user would enter:

```
>>>MyFunction()
Enter a positive, non-zero, number: -3
That is not a valid entry. Goodbye!

>>>MyFunction()
Enter a positive, non-zero, number: 4
4
3
2
1
0
```

```
def MyFunction():
    x = int(input("Enter a positive, non-zero, number: "))
    if x > 0:
        while x >= 0:
            print(x)
            x = x - 1
    else:
        print("That is not a valid entry. Goodbye!")
```

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6. (10 pts) Consider this Python function:

```
def Loopy(m, n, p):
    b = 0
    for a in range(m, n, p):
        b += a
    print(b)
```

a) (4 pts) What is variable **b** called here? *Hint*: See my lecture and/or textbook p. 134-136

The variable b can be considered an 'initializer', also considered a declare variable, which allows the for loop to have a basis, which in this case is = 0. In this case, b = 0 initializes the accumulator. print(b) is the sum of numbers in b.

For the next 3 questions, what would happen if you called the function in these different ways? *Hint*: You can try these on IDLE, but be prepared to answer *how* this happens in an exam!!

b) (2 pts) `Loopy(2, 5, 1)`

9

c) (2 pts) `Loopy(-5, 3, 3)`

-6

d) (2 pts) `Loopy(25, 17, -2)`

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7. (20 pts) Given a list that has students' names, GPAs, and ages, as follows:
myL = [["Joe", 3.2, 19], ["Melissa", 3.8, 20], ["Kate", 3.8, 21], ["Marc", 2.9, 21]]
Write Python code that will read-in this list (the code assumes that there are 3 entries per sub-list and that they are of the correct type as shown in the example), print each name, GPA and age (separated by commas) on separate lines and then calculate and print the age average, like so:

```
Joe, 3.2, 19
Melissa, 3.8, 20
Kate, 3.8, 21
Marc, 2.9, 21
Age Average: 20.25
```

You MUST use one or more **for**-loops or you will not get any credit. The output of your program has to match the above exactly.

```
def grades(x):
    age = []
    for i in range(0, len(x)):
        a = str(x[i]), str, b('[]')
        b = a.replace(" ", "")
        print(b)
        age.append(L[i][2])
    average = sum(age) / len(age)
    print('Age Average :', average)

grades(myL)
```