Name : _____

Grading TA: _____

- INTEGRITY: By taking this exam, you pledge that this is your work and you have neither given nor received inappropriate help during the taking of this exam in compliance with the Academic Honor Code of Georgia Tech. Do NOT sign nor take this exam if you do not agree with the honor code.
- DEVICES: If your cell phone, pager, PDA, beeper, iPod, or similar item goes off during the exam, you will lose 10 points on this exam. Turn all such devices off and put them away now. You cannot have them on your desk.
- ACADEMIC MISCONDUCT: Academic misconduct will not be tolerated. You are to uphold the honor and integrity bestowed upon you by the Georgia Institute of Technology.
  - Keep your eyes on your own paper.
  - Do your best to prevent anyone else from seeing your work.
  - Do NOT communicate with anyone other than a proctor for ANY reason in ANY language in ANY manner.
  - Do NOT share ANYTHING during the exam. (This includes no sharing of pencils, paper, erasers).
  - Follow directions given by the proctor(s).
  - Stop all writing when told to stop. Failure to stop writing on this exam when told to do so will result in a substantial grade penalty.
  - Do not use notes, books, calculators, etc during the exam.
- TIME: Don't get bogged down by any one question. If you get stuck, move on to the next problem and come back once you have completed all of the other problems. This exam has 11 questions on 12 pages including the title page. Please check to make sure all pages are included. You will have 100 minutes to complete this exam.

I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community. I have also read and understand the requirements outlined above.

Signature: _____

Question	Points	Score
1. Classes and Objects	5	
2. Multiple Choice	6	
3. List Questions	6	
4. iPhone	5	
5. Bravarian Strings	5	
6. GUI drawing	10	
7. Find Last Period	8	
8. GetTemp	10	
9. QB Rating	8	
10. Extract 21	12	
11. countSmiles	9	
Total:	84	

1. *(5 points)*
Define **class** and **object**. Explain how they are related. Explain their similarities and their differences. Be brief, and to the point.

2. *(6 points)*
For each of the following multiple choice questions, indicate the single most correct answer by circling it!

(a) [1 pt] Which of the following statements about Radiobuttons are false?

A. Radiobuttons have a 'state' parameter
B. Radiobuttons have a 'variable' parameter
C. Radiobuttons have a 'value' parameter
D. Radiobuttons can change the value of StringVar's
E. All of the above statements are true.

(b) [1 pt] Suppose you want to extract all dates from a string of text, myText. The date will always be in the format YYYY-MM-DD. Which of the following will return a list of only these date strings?

A. `theDates = findall("[0-9]{4}.*[0-9]{2}.*[0-9]{2}", myText)`
B. `theDates = findall("\D{4}-\D{2}-\D{2}", myText)`
C. `theDates = findall("\d*-\d*-\d*", myText)`
D. `theDates = findall("\d{4}-\d{2}-\d{2}", myText)`
E. `theDates = findall("\S{4}-\S{2}-\S{2}", myText)`

Use the following code to answer the next two questions.

```
aList = [5, 10, 15, 20]
bList = 2 * aList
cList = bList
```

(c) [1 pt] What list does bList reference?

A. `[2, 5, 10, 15, 20]`
B. `[10, 20, 30, 40]`
C. `[5, 10, 15, 20, 5, 10, 15, 20]`
D. `[5, 10, 15, 20, 20, 15, 10, 5]`

(d) [1 pt] Which of the following statements is true?

A. cList is an alias of bList
B. bList is an alias of aList
C. cList is an alias of aList
D. cList is a copy of bList

(e) [1 pt] Assume the class Test1 creates a GUI and has been defined correctly. Examine the following lines of code:

```
rootWin = Tk()
question = Test1(rootWin)
```

Which of the following lines of code, if executed after the above code, will cause Python to throw an error?

A. `Test1.difficulty = "moderate"`
B. `experience = Test1(rootWin)`
C. `rootWin.mainloop()`
D. `app.Label(rootWin, text = "LeBron")`
E. `question.answer = "here?"`

(f) [1 pt] Which of the following data types are NOT sequences?

A. Tuples B. Dictionaries C. Strings D. Lists E. All of these are sequences

3. *(6 points)*
Examine the following code:

```
a=["Apache","CS2316","Python",["Bacon","Toast","Eggs","Avocado"]]
b=a[-1]
c=a.reverse()
d=b.sort()
e=a[-1]
f=a[0]
```

After the code executes, what does each of the variables point at?

a -

b -

c -

d -

e -

f -

4. *(5 points)*
Examine the following code and write down exactly what is printed to the screen when it is executed:

```
class iPhone:
    def __init__(self,software):
        self.software=software
        self.color="pink"

    def printsoftware(self):
        print("My iPhone's software is",self.software)

    def changePhones(self,phone):
        self.printsoftware()
        self.phone=phone
        self.phone="Android"
        return print("My phone is "+self.phone)

myPhone=iPhone("6.1.4")
print(myPhone.color)
print(myPhone.changePhones("Windows"))
```

5. *(5 points)*
Examine the following code.

```
def iSeeYou():

    aString = "THIS IS NOT A TEST"
    bString= aString[::-1]
    aLetter = bString[12]
    bLetter = bString[0]

    cString = "MULL IT OVER"
    dString = cString[3:0:-1]

    nonsenseString = "MLOIOWNCXA"
    eString = nonsenseString
    fString = eString[0:7:3]

    print(aLetter + dString + fString + nonsenseString[9]+ bLetter + aLetter)

iSeeYou()
```

What is printed to the screen when this code is executed?

6. *(10 points)*
Given the following code, draw the GUI that is produced TWICE. Draw it once as it first appears. To the right of that, draw the GUI a second time after the word Samantha is typed into the self.entry1 entry and the button is pressed. Include the window with any decorations. Indicate colors, shading, or state with arrows and labels.

```
from tkinter import *
class MyScreen:
    def __init__(self,Window):
        self.var=StringVar()
        button1 = Button(Window, text="Guess!", command=self.clicked)
        button1.pack(side=RIGHT)
        frame = Frame(Window)
        frame.pack(side=RIGHT)
        label1 = Label(frame, text="Your Guess:")
        label1.grid(row=1,column=2)
        self.SV = StringVar()
        self.entry1 = Entry(frame, textvariable= self.SV)
        self.entry1.grid(row=1, column=4)
        label2=Label(frame, text="Are you right?")
        label2.grid(row=2,column=2)
        self.entry2 = Entry(frame)
        self.entry2.grid(row=2, column=4)
        self.entry2.config(state="readonly")


    def clicked(self):
        self.entry2.delete(0, END)
        if self.entry1.get()=="Samantha":
            self.entry2.insert(0, "Correct!")
        else:
            self.entry2.insert(0, "WRONG")

Window = Tk()
Window.title("Most Hyper TA?")
app = MyScreen(Window)
Window.mainloop()
```

7. *(8 points)*

You need to extract the file extension from a filename such as "GeorgeP.Burdell.gif". To do this, you need to search through a string to find the position (index) of the LAST period. Write a function named **findLastPeriod** that takes a string as a parameter and returns the position of the last period in the string as an integer. If the string has no periods, return -1.

Example use case:

```
>>> x = findLastPeriod("test.txt")
>>> print(x)
4
```

8. *(10 points)*

You are hired to write the control software for a bio-reactor. As part of this job, you need to write a function named `getTemp` that takes no parameters. It should display a message (prompt) to the user asking them to enter a temperature between 30 and 90 degrees C. (inclusive) ("Please enter a temp between 30 and 90 degrees C") Note that the user may enter a temp such as 45.8 which is valid.

Your function should return the temperature the user entered as a float. If the user does not enter a valid temperature (not a number, lower than 30 or higher than 90) you should print out "Invalid Temp, try again!", and then repeat the prompt asking for a temperature until they get it right.

9. *(8 points)*

Write a function called `qbRating` that accepts a dictionary as a parameter. The dictionary will be structured as follows:

```
nfl = { 'Falcons':[360,'Matt Ryan'], 'Broncos' : [450, 'Peyton Manning'],  ...}
```

such that each key/value pair is of the form: `team : [passing yards, "Players Name"]` The dictionary may have the player with the top passing yardage from many different teams, not just the 2 shown in our example. The qbRating function will return a list of tuples, in the following form:

```
[ (passing yards, "Player Name"), (passing yards, "Player Name"), ...]
```

The tuples must be sorted by the number of passing yards (largest first). For the example above, the output would look like: `[ (450, 'Peyton Manning'), (360, 'Matt Ryan'), ... ]`

10. *(12 points)*
Write a function `extract21` that takes in one parameter, the name of a CSV file, as a string. This CSV file contains the names and ages of a group of students. (lastname, firstname, age). Open the file, read in the data, and extract only those students who are 21 or over. Sort the data by lastname (then firstname, then age to break ties). Write the extracted data to a file called "over21.csv" using the same (lastname, firstname, age) format.

For example, if our input file looked like this:

```
Kassem, Samantha, 20
Ferenzio, Bobbay, 18
Stein, Jarrod, 21
Avery, Jordan, 21
Smith, Scotty, 20
Lawler, Harry, 22
```

the output file should look like this:

```
Avery, Jordan, 21
Lawler, Harry, 22
Stein, Jarrod, 21
```

11. *(9 points)*
You are to write a function named countSmiles which will accept a string representing the URL of a website. Your objective is to download the HTML from this website and return an integer representing the number of times a smiley occurs. A Smiley is the two character combination of a colon and close parenthesis :).

This page intentionally left blank. You may use it for scratch paper. If you place an answer on this page, box it, indicate which problem it is for by number, and BE SURE TO WRITE "Answer on last page" at the problem location!