Your (printed!) Name: _____ CS 1803 Exam 2

Grading TA / Section: _____ Monday, Oct 25th, 2010

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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 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 is academic misconduct.
Do not use notes, books, calculators, etc during the 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.

Signature: _____

Question	Possible Points	Earned Points	Graded By
1: True/False	15		
2: Short Answer/ Multiple Choice	20		
3: GUI	15		
4. Code Reading	10		
5: Code Writing & File I/O	10		
6: Code Writing - Dictionaries	10		
7: Code Writing - Lists	20		
Total	100		

Question 1: True/False (15 points)

Indicate if each statement is True or False. If the statement is false, write what the true statement is.

_____After adding an element to a grid, you should pack it as well.
False – A frame should either be packed or use a grid layout, not both.

_____Tuples are mutable data types.
False – Tuples are immutable data types.

_____Methods can only be called on objects that are instances of the class in which the method is written.
True.

_____The following 2 lines of code make two variables that have references which both point to the same object.

```
hwA = Homework()
hwB = Homework()
```

False – These two lines of code create two independent instances (objects) of the same class.

_____Given the following code, the final value of student1.name is "Bob"

```
student1 = Student()
student2 = student1
student1.name = "Bob"
student2.name = "Fred"
```

False – The final value of student1.name is "Fred"

_____Methods in a module can be used without importing the module just by calling the method from the module name
Ex: csv.reader(open("myFile.csv"), delimiter = " ")
False: The module must be imported and the methods must be called from the module name.

_____The following code will throw an exception if the named file does not exist.
f = open("namedFile.txt", "w")
False: The named file will be created if it does not exist.

_____The flush() method can be used to ensure that all data is written to disk.
True

Grading: +1 for a correct true/false answer
+1 for a correct explanation if false.
(+1 bonus point to make it 15 total!)

Question 2: Short Answer (20 points)

A. What is newList after the following code is run

```
myList = [3,4,5]
newList = myList*2
```

Ans: [3,4,5,3,4,5]

B. Given a tkinter GUI Label named Lbl3 that has already been created, how to you change the text on Lbl3 to "Some New Stuff"? (write the line of code)

Ans: Lbl3.config(text="Some New Stuff")

C. Methods that belong to a class must have what as their first parameter?

Ans: self

D. What does it do when you create a variable and set it equal to StringVar()?

Ans: Creates a StringVar object

E. When using the grid function on a widget, what does the columnspan option do?

Ans: Allows your widget to extend across multiple columns without spreading them out.

F. What does the method .write(text) do in the context of files?

Ans: It appends text onto the end of an open file.

G. How do you make a button call a function when it is clicked?

Ans: When creating it, set the 'command' parameter equal to self.TheNameOfTheFunction

H. Describe how to instantiate a canvas.
Ans: VarName = Canvas(win/frame), or the equivalent in words.

I. What is the difference in using pack() and grid() in a GUI frame?
Ans: pack() places the widgets vertically in the order that they are added to the frame
using a grid the location of each widget can be specifically defined and the order that the widgets are added to the frame is unimportant.

J. What are 3 states a tkInter GUI Entry widget can have?
Ans: NORMAL, DISABLED, “readonly”

Grading:

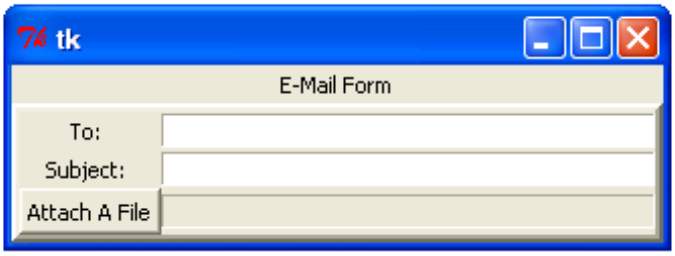
+2 for each correct answer

Question 3: GUI Drawing and Code Writing (15 points)

Draw the GUI that is made by running the following code *before any button is pressed*. Be very clear in your diagram and make any necessary notes to clarify your drawing. Fill in the code for the clicked method according to the instructions listed as comments in the code.

```
from tkinter import *

class DrawGUI:
    def __init__(self, root):
        self.win = Frame(root)
        self.win.pack()
        self.title = Label(self.win, text = "E-Mail Form", anchor = CENTER)
        self.title.pack()
        self.frame = Frame(self.win)
        self.frame.config(borderwidth=4, relief = RAISED)
        self.frame.pack()
        self.to = Label(self.frame, text = "To: ")
        self.to.grid(row=1,column = 0)
        self.subject = Label(self.frame, text = "Subject: ")
        self.subject.grid(row = 2, column = 0)
        self.sub = Entry(self.frame, width = 40)
        self.sub.grid(row = 2, column = 1)
        self.attach = Button(self.frame, text = "Attach A File")
        self.attach.bind("<Button-1>", self.clicked)
        self.attach.grid(row = 3, column = 0)
        self.email = Entry(self.frame, width = 40)
        self.email.grid(row = 1, column = 1)
        self.file = Entry(self.frame, width = 40, state = "readonly")
        self.file.grid(row = 3, column = 1)

    def clicked(self,event):
        #open a file dialogue so the user can pick a file


        #enter the name of the file in the entry field named “file”
        #the text should update correctly if the user clicks the button and selects a file more than once




        #make sure the entry is read-only after the text has been entered




mainwin = Tk()
sample = DrawGUI(mainwin)
mainwin.mainloop()
```

Sample Solution :




```
def clicked(self,event):
        f = filedialog.askopenfilename()
        self.file.config(state = NORMAL)
        self.file.delete(0,END)
        self.file.insert(0, f)
        self.file.config(state="readonly")
```

Grading: 15 points

+10 GUI drawing is correct- each component is present and in the correct location
- +1 window is drawn
- +1 Including the window decorations (at least three of icon, title, min/max and close buttons)
- +1 inner frame is raised/border clearly drawn
- +1 “E-Mail Form” label
- +1 “To:” label
- +1 “Subject:” label
- +1 “Attach A File “button
- +1 To: entry field – not read only
- +1 Subject: entry field - not read only
- +1 Attach A File: entry field- read only (indicated with gray, or text...)

+ 5 clicked method code
- +1 correct use of filedialog
- +1 change the state to Normal
- +1 to delete any previous text
- +1insert the text in the entry field
- +1 change the state back to readonly

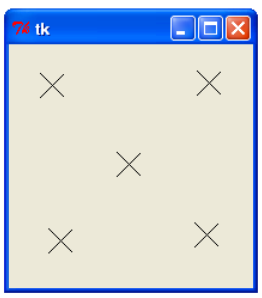
Question 4: Code Reading (10 points)

Describe what happens when the following code is run and what happens when the user clicks on the canvas. Be specific. Draw the resulting GUI when the user has clicked 4 times (choose any 4 distinct points).

```
from tkinter import *

class QCanvas():
    initialX = 100
    initialY = 100

    def __init__(self, tkMainWin):
        self.xSize = 10
        self.ySize = 10
        frame = Frame(tkMainWin)
        frame.pack()
        self.canvas = Canvas(frame, height = 200, width = 200)
        self.canvas.pack()
        self.canvas.bind( "<Button-1>", self.clicked )
        self.action()

    def clicked(self, event):
        self.initialX = event.x
        self.initialY = event.y
        self.action()

    def action(self):
        self.point1 = self.initialX - self.xSize
        self.point2 = self.initialY - self.ySize
        self.point3 = self.initialX + self.xSize
        self.point4 = self.initialY + self.ySize
        self.canvas.create_line(self.point1, self.point2, self.point3, self.point4)
        self.canvas.create_line(self.point1, self.point4, self.point3, self.point2)

mainWin = Tk()
someVar = QCanvas(mainWin)
mainWin.mainloop()
```

Sample Solution:

When the code is run a frame with a 200x200 canvas is made and an X is drawn in the center of the frame with side length 20. Each time the user clicks an X is drawn on that location with the center of the X being where the user clicked.



Grading:
+ 5 describe what happens when the code is run
+5 draw the GUI and canvas correctly
+1 for each of the 5 Xs- one of them must be in the center

Question 5: Code Writing (10 points)

You have a text file of all of the activities that you have to do for the next two weeks. Each line in the file is formatted the same way, as shown below.

Group/Class, Activity Name, Activity Date, Activity Time Range

Write a function named activitySort that takes in the name of the CSV file, reads the file, and then writes a new text file named "sortedActivities.txt". This file should have all of your activities for the next two weeks but grouped so that all activities for the same Group/Class are listed on consecutive lines. (Hint: You can sort based upon the first item on the line). For example:

CS1803, Test2, 10/25, 3-4pm

CS1803, HW8, 10/29, 6pm

Intermurals, Final Game, 10/26, 8-10pm

Sample Solution

```
def activitySort(filename):
    file = open(filename,"r")

    activityList = file.readlines()
    file.close()

    activityList.sort()

    sortedFile = open("sortedActivities.txt","w")

    for activity in activityList:
        sortedFile.write(activity)

    sortedFile.close()
```

Grading:
+1 method header
+1 open the input (existing) csv file to read
+1 open the output (new) file for writing
+2 read the csv file
+2 sort the lines by the Group category (first item, can use standard sort...)
+1 write the data to the output file
+1 close the input csv file
+1 close the output text file

Question 6: Code Writing (10 points)

Georgia Tech's newspaper The Technique has decided to take a survey of which laptop brand is the most popular on Georgia Tech's campus. You have been asked to write a function named "saveData" to help manage the data. This function will accept two parameters: First, the name of the student (you may assume that the name will contain a first and last name i.e. "John Doe") as a SINGLE string and the name of their laptop brand as a SINGLE string (e.g. "Dell"). You must store this information in a dictionary where the key consists of the students name in the format: last name, first name (i.e. "Doe, John") and the value is the laptop brand string converted to lowercase (i.e. "dell"). Assume the dictionary is named laptopData and that it is a pre-existing global variable. You do not have to do any checking to see if the data is already in the dictionary. You may assume that all names have exactly two parts, a given name (first) and a family name (second) which are separated by a space.

Sample Solution

```
def saveData(name, laptop):

  global laptopData                #This line is optional, but good practice!

  nameList = name.split(" ")
  firstName = nameList[0]
  lastName = nameList[1]
  newNameFormat = lastName + ", " + firstName

  laptop = laptop.lower()

  laptopData[newNameFormat] = laptop
```

Grading: 10 pts
+2 method header with correct parameters
+1 correctly found the first name
+1 correctly found the last name
+1 correctly concatenated the name string
+1 correctly formatted (lowercase) the laptop name
+4 insert data into dictionary

Question 7: Code Writing (20 points)

Question 7 will be completed in your Recitation with your new Pair Programming Partner. You will be given question 7 by your TA's and will have 30 minutes to work on it with your partner using your laptops. You will be able to refer to your notes and use the Internet. You must submit your assignment via T-Square before your recitation is finished. Preview: Question 7 involves reading data from a CSV file and calculating details about it (but you won't need to write a GUI!)

The rest of this sheet can be used as scratch paper...

See separate problem sheet and grading rubric.