

4. Tkinter Past Paper Questions

1. The following program creates a graphical user interface allowing the user to enter a sequence of numbers and calculate either the largest value or the sum. Assume that the functions `maxList` and `sumList` each take a string as a parameter and return the appropriate value. For example, `maxList("2 5 1 4")` returns 5.

```
from Tkinter import * #1

root = Tk() #2

f = Frame( root ) #3
f.pack() #4

def calculate(): #5
    s = e.get() #6
    r = v.get() #7
    if r==1: #8
        result = maxList(s) #9
    else: #10
        result = sumList(s) #11
    l.configure( text = str(result) ) #12
    l.update() #13

e = Entry( f ) #14
e.pack() #15

l = Label( f, text="" ) #16
l.pack() #17

v = IntVar() #18

r1 = Radiobutton( f, text = "Max", variable = v, #19
                 value = 1, command = calculate) #20
r1.pack() #21

r2 = Radiobutton( f, text = "Sum", variable = v, #22
                 value = 2, command = calculate) #23
r2.pack() #24

q = Button( f, text = "Quit", #25
           command = root.destroy ) #26
```

q.pack() #27

root.mainloop() #28

- a. Explain the purpose of each line or group of lines in the program, and describe exactly how the user should interact with it. Ignore any errors that may occur due to inappropriate input.

[20]

- b. The question does not say what `maxList` and `sumList` do if their input is inappropriate. What would you like them to do, so that the user can see an error message in this case? You do not need to define `maxList` and `sumList`, but if your solution also requires modifications to `calculate` then you should define the new version of `calculate`.

[5]

2. Consider the following Tkinter program:

```
from string import *; from Tkinter import *
root = Tk(); f = Frame( root ) ; f.pack()

c = Canvas( f, height = 100, width = 200,
            background = "white" )
c.grid( columnspan=2 )

x = 100; y = 50
i = 3
p = c.create_oval( x-i,y-i,x+i,y+i )
c.update()

def nextAction():
    global x, y
    s = e.get()
    r = v.get()
    bits = split( s )
    dx = int( bits[ 0 ] ); dy = int( bits[ 1 ] )
    nx = x+dx; ny = y+dy
    if r==1:
        c.create_line( x,y,nx,ny )
        c.update()
    l.configure( text = str( nx ) + " " + str( ny ) )
    l.update()
    x = nx
    y = ny
    c.move( p,dx,dy )
```

```

        c.update()

e = Entry( f )
e.grid()

l = Label( f, text= str( x ) + " " + str( y ) )
l.grid( row=1, column=1 )

v = IntVar()

r1 = Radiobutton( f, text = "This", variable = v, value = 1)
r1.select()
r1.grid( row=2 )

r2 = Radiobutton( f, text = "That", variable = v, value = 2)
r2.grid( row=2, column=1 )

d = Button( f, text = "Do Something", command = nextAction )
d.grid( row=3)

q = Button( f, text = "Quit", command = root.destroy )
q.grid( row=3, column=1)

root.mainloop()

```

- a. Draw the graphical user interface created by the program. You do not need to be precise on the sizes of the items, but you should ensure that the positioning of items relative to one another is correct.

[6]

- b. Explain, *in only a few sentences*, the operation of the program e.g. what is displayed as the user interacts with the various components of the interface. **DO NOT** explain exactly what each separate line does.

[6]

- c. What will happen if the user types in inappropriate input? How would you adjust the code to improve the user interface in this respect? (You do not need to write the precise code for this.)

[3]

3. Consider the following Tkinter program:

```

from Tkinter import *

root = Tk() ; f = Frame( root ); f.pack()

```

```

c = Canvas( f, height=100, width=200, background = "white" )
c.grid( rowspan=2,columnspan=3 )

p = c.create_oval( 97,47,103,53 ); c.update()

def nextAction():
    s = int( e.get() )
    r = v.get()
    dx = 0; dy = 0
    if r == 1:
        dy = -s
    elif r == 2:
        dx = -s
    elif r == 3:
        dx = s
    else:
        dy = s
    c.move( p,dx,dy )
    c.update()

e = Entry( f, width=2 ); e.grid(row=1,column=3)
e.insert( 0,"1" )

l = Label( f, text="Step" ); l.grid( row=0, column=3 )

v = IntVar()

r1 = Radiobutton( f, text = "A", variable = v, value = 1)
r1.grid( row=2, column=1 ); r1.select()

r2 = Radiobutton( f, text = "B", variable = v, value = 2)
r2.grid( row=3, column=0 )

r3 = Radiobutton( f, text = "C", variable = v, value = 3)
r3.grid( row=3, column=2 )

r4 = Radiobutton( f, text = "D", variable = v, value = 4)
r4.grid( row=4, column=1 )

d = Button( f, text = "A1", command = nextAction )
d.grid( row=3, column=3)

```

```
q = Button( f, text = "A2", command = root.destroy )
q.grid( row=4, column=3)
```

```
root.mainloop()
```

- a. Draw the graphical user interface created by the program. You do not need to be precise on the sizes of the items, but you should ensure that the positioning of items relative to one another is correct.

[5]

- b. Explain, *in only a few sentences*, the operation of the program e.g. what is displayed as the user interacts with the various components of the interface. **DO NOT** explain exactly what each separate line does.

[5]

- c. Is it possible to crash the program? If so, explain how, and explain accurately how you would go about fixing the problem, writing out the adjusted code if necessary.

4. Consider the following Tkinter program:

```
from Tkinter import *

root = Tk()
f = Frame( root )
f.pack()

c = Canvas( f, height = 100, width = 200,
            background = "white",
            bd = 5, relief = RIDGE )
c.grid( rowspan = 2 )

p1 = 100
p2 = 50

def action( e ):
    global p1, p2
    if e.num == 1:
        if v.get() == 1:
            r1.deselect()
            r2.select()
        else:
            c.create_line( p1, p2, e.x, e.y )
            p1 = e.x
            p2 = e.y
```

```

        elif e.num == 2:
            s = d.get()
            c.create_text( e.x, e.y, text = s )

        c.update()

c.bind( "<Button>",action )

d = Entry( f, width=20 )
d.grid(row=2)
d.insert( 0,"message" )

v = IntVar()

r1 = Radiobutton( f, text = "Move", variable = v, value = 1)
r1.grid( row=0, column=1);

r2 = Radiobutton( f, text = "Join", variable = v, value = 0)
r2.grid( row=1, column=1); r2.select()

x = Button( f, text = "A2", command = root.destroy )
x.grid( row=2, column=1)

root.mainloop()

```

- a. Explain precisely the action of the lines identified with comments 1, 2, and 3. [5]
- b. Draw the graphical user interface created by the program. You do not need to be precise on the sizes of the items, but you will lose marks if you do not ensure that the positioning of items relative to one another is correct – look at the layout commands carefully. [6]
- c. Explain, *in only a few sentences*, the operation of the program e.g. what is displayed as the user interacts with the various components of the interface. **DO NOT** explain exactly what each separate line does. [5]