Python Assessments 1

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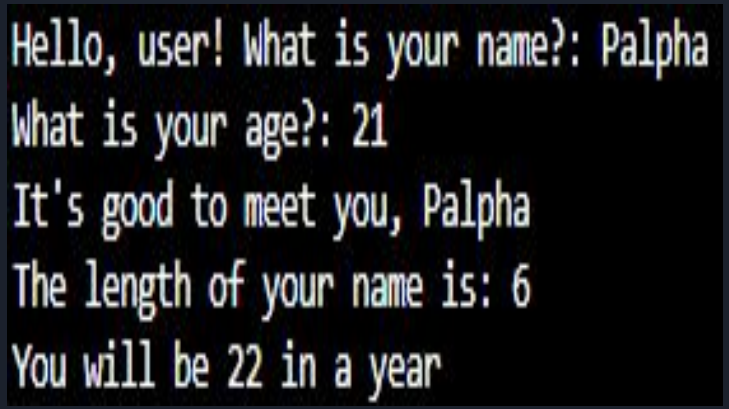
Chapter I
Python Refresher

E1: User Input Output

```
# Exercise 1: User input output      You, last week • Submittin

# Write code to prompt the user to input her/his name and age ar

# Let's import the string first
import string

# Then we would take input from user
name = input("Hello, user! What is your name?: ")
age = int(input("What is your age?: "))

# Then we add one in the input and find the length of the name
age = age + 1
length = len(name)

# Finally, we print to see the results
print("It's good to meet you, " + name)
print("The length of your name is: "+ str(length))
print("You will be "+str(age)+" in a year")
```



E2: Maths

```python
# Just like last time, let's import math first
      You, last week • Submitting my exercises s
import math

# Next we put the inputs for the user to type in

a=int(input("Enter first number: "))
b=int(input("Enter second number: "))

# Finally, we print to see the results

print("Sum: ",a+b)
print("Difference: ",a-b)
print("Product: ",a*b)
print("Quotient: ",a/b)
print("Remainder: ",a%b)
```

```
Enter first number: 42
Enter second number: 36
Sum:  78
Difference:  6
Product:  1512
Quotient:  1.1666666666666667
Remainder:  6
```

Exercise 3: Is it a Triangle

```
# Let's make three inputs to measure the sides each
a = int(input("Enter the length of the first side: "))
b = int(input("Enter the length of the second side: "))
c = int(input("Enter the length of the third side: "))

# Then we see if two sides are greater than one side using the if-else met
if a+b>c and b+c>a and c+a>b:

    # This should also identify what type of triangle is this
    if a==b==c:
        print("This is an equilateral triangle.")
    elif a==b or b==c or c==a:
        print("This is an isosceles triangle")
    else:
        print ("This is a scalene triangle")

    # Otherwise, it's not even a triangle if typed something unexpected
else:
    print("Oof... this is not a triangle")
```

```
Enter the length of the first side: 3
Enter the length of the second side: 5
Enter the length of the third side: 5
This is an isosceles triangle
```

E4: Largest Number

```
# Three inputs to insert three numbers
a = int(input("a = "))
b = int(input("b = "))
c = int(input("c = "))

# And just like the last time, we compare them using the if-else method
# this time with elif to see the results
if (a>b) and (a>c):
    print("a has the largest number.")
elif (b>a) and (b>c):
    print("b has the largest number.")
else:
    print("c has the largest number.")      You, last week • Submitting
```

```
a = 3
b = 4
c = 7
c has the largest number.
```

E5: Continue

```
# Exercise 5: Continue

# Write a program that implements a while loop. This program should ask t

# range() is vital for this one.
# Any destinative number that makes the limit will cause a continous loop
# until it reach it's destination before the targeted number
for Y in range(13):
    if Y == 10:
        continue
    print (Y)       You, last week • Submitting my exercises so far
```

```
0
1
2
3
4
5
6
7
8
9
11
12
```

E6: FizzBuzz

```python
# Exercise 6: FizzBuzz      You, last week • Submitting my exercises so f

# Write a program that prints the numbers from 1 to 100. But for multiples

# fizzbuzz is just... oddly new to me
for fizzbuzz in range(101):
    # if I could tell... numbers that are multiplied by 3 are fizz
    if fizzbuzz % 3 == 0 and fizzbuzz % 5 == 0:
        print ("FizzBuzz")
        continue
    # Continuing... numbers that are multiplied by 5 are buzz
    elif fizzbuzz % 3 == 0:
        print("fizz")
        continue
    # And numbers that are both multiplied by 3 and 5, ex. 50, are fizzbuz
    elif fizzbuzz % 5 == 0:
        print("buzz")
        continue
    print(fizzbuzz)
```

```
FizzBuzz
1
2
fizz
4
buzz
fizz
7
8
fizz
buzz
11
fizz
13
14
FizzBuzz
16
17
fizz
19
buzz
fizz
22
23
fizz
buzz
26
fizz
28
29
FizzBuzz
31
32
71
fizz
73
74
FizzBuzz
76
77
fizz
79
buzz
fizz
82
83
fizz
buzz
86
fizz
88
89
FizzBuzz
91
92
fizz
94
buzz
fizz
97
98
fizz
buzz
```

E7: Even Numbers

```
# Like last time, range() is useful for this one. Making 101 the ending nu
for i in range (1, 101):
    if i % 2 != 0:
        continue
    print(i)
```

```
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
```

->

```
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
100
```

E8: Print Pattern

```
# Exercise 8: Print Pattern      You, last week • Submitting my exercises

# Write a program to display the following pattern using nested loops.

# This one is interesting. We're making a pyramid using input() and range(
e = int (input("enter the number of rows:"))
for i in range (1, e+1):
    for j in range (1, i+1):
        print (j, end="")
    print()
```

```
enter the number of rows:5
1
12
123
1234
12345
```

E9: Integer List

```
# Create an int list with 10 values

ten = [50, 40, 30, 20, 10, 60, 70, 80, 90, 100]

# Output the list using 'a' for loop

for a in ten:
    print(a)

# Output the highest and lowest value

high = max(ten)
low = min(ten)
print ("The highest number is",high)
print ("The lowest number is",low)

# Sort the elements in ascending order

ascend = sorted(ten)
print ("This list is ascended", ascend)

# Sort the elements in descending order

ten.sort(reverse=True)
print ("This list is descended", ten)

# Append two elements
ten.append (110)      You, 1 second ago • Uncomm
ten.append (120)

# Print the list after appending

print(ten)
```

```
50
40
30
20
10
60
70
80
90
100
The highest number is 100
The lowest number is 10
This list is ascended [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
This list is descended [100, 90, 80, 70, 60, 50, 40, 30, 20, 10]
[100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 110, 120]
```

E10: Film Dictionary

```
# Let's do this with one of my favorite movies to watch from the past 2 ye
films = {
    "Movie": "1917",
    "Director": "Sam Mendes",
    "Year": "2019"
}

for key, value in films.items():
    print(key, value)       You, last week • Submitting my exercises so fa
```

```
Movie 1917
Director Sam Mendes
Year 2019
```

E11: Year Tuples

```
# Exercise 11: Year Tuples      You, last week • Submitting my exerci

# Create a tuple with values

year = (2017, 2003, 2011, 2005, 1987, 2009, 2020, 2018, 2009)

print(year)

# Access the value at index -3

print(year[-3])

# Reverse the tuple and print the original tuple and reversed tuple

r = reversed(year)
print(tuple(r))

# Count number of times 2009 is in the tuple (use count() method)

c = year.count(2009)
print(c)

# Get the index value of 2018(Use index method)

i = year.index(2018)
print(i)

# Find length of given tuple(Use len() method)

print(len(year))
```

```
(2017, 2003, 2011, 2005, 1987, 2009, 2020, 2018, 2009)
2020
(2009, 2018, 2020, 2009, 1987, 2005, 2011, 2003, 2017)
2
7
9
```

E12: Area Functions

```python
# Here we go again, this time with Math by importing pi

from math import pi

# Calculating the area of the Square

s = float(input("Enter the side length of the square: "))

area = s * 2

print("The area of the square is: ", area)

# Calculating the area of the Triangle

l = float(input("Enter the base length of the triangle: "))
h = float(input("Enter the base height of the triangle: "))

area = 0.5 * l * h

print("The area of the triangle is: ", area)

# Calculating the area of the Circle

r = float(input("Enter the area of the circle: "))

area = pi * r ** 2

print("The area of the circle with radius ", r , " is: ", area)
```

```
Enter the side length of the square: 5
The area of the square is:  10.0
Enter the base length of the triangle: 4
Enter the base height of the triangle: 5
The area of the triangle is:  10.0
Enter the area of the circle: 1
The area of the circle with radius  1.0  is:  3.141592653589793
```

E13: Product of list items

```python
# Exercise 13: Product of list items

# Write a program that passes a list as an argument to a function. The

# NumPy, as the name suggests, is for working with numbers in python,
# for operations like multiplication

import numpy

odd = [1, 3, 5]
even = [2, 4, 6]       You, last week • Submitting my exercises so far

result1 = numpy.prod(odd)
result2 = numpy.prod(even)

print(result1)
print(result2)
```

```
15
48
```

Chapter II
Graphical User Interface

E1: Welcome

```
# Exercise 1: Welcome

# Develop a GUI program to do the following using the tkinter module

import tkinter

from tkinter import *

main = Tk()

main.title('Exercise 1')      You, last week • Submitting my exercises so far
main.geometry('500x200')

message=Label(main,text="Welcome to Tkinter", bg='skyblue', width=20, height=30, font=('Times',20,'bold'))
message.pack()

main.configure(bg='dodgerblue')
main.resizable(False,False)
main.mainloop()
```

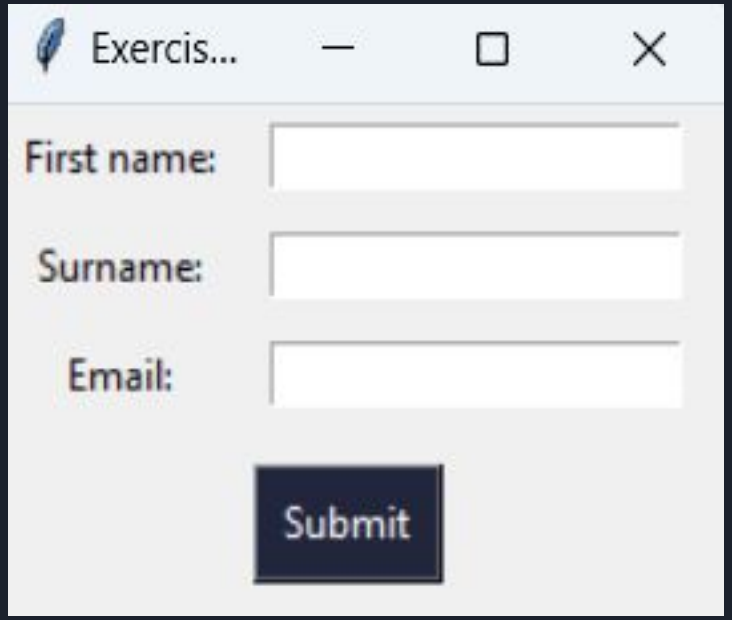
E2: Managing Layout

```
# Exercise 2: Managing Layout

# a: Using Pack
# Create a GUI with 4 labels using the pack() geometry

import tkinter

from tkinter import *

main = Tk()

main.title('Exercise 2 a')

Label(main, text="A", width=12, bg='red', relief=GROOVE, bd=5).pack(side=TOP, expand=1, fill=X)
Label(main, text="B", width=12, bg='yellow').pack(side=BOTTOM)
Label(main, text="C", width=12, bg='blue').pack(side=LEFT, expand=1, fill=Y)
Label(main, text="D", width=12, bg='white').pack(side=RIGHT)

main.resizable(True,True)
main.mainloop()
```


```
# B: Square Grid
# With the pack layout manager, Create the following

import tkinter

from tkinter import *

main = Tk()

main.title('Exercise 2 b')

Frame1 = Frame(main,border=5,relief="solid")
Frame1.pack(side=LEFT,expand=TRUE,fill="both")

A = Label(Frame1,text="A",bg="#22263d",fg="white")
B = Label(Frame1,text="B",bg="white",fg="#22263d")
A.pack(side=TOP,expand=TRUE,fill="both")
B.pack(side=BOTTOM,expand=TRUE,fill="both")
      You, 5 days ago • Update Exercise 2 b.py
Frame2 = Frame(main,border=5,relief="solid")
Frame2.pack(side=RIGHT,expand=TRUE,fill="both")

C = Label(Frame2,text="C",bg="white",fg="#22263d")
D = Label(Frame2,text="D",bg="#22263d",fg="white")
C.pack(side=TOP,expand=TRUE,fill="both")
D.pack(side=BOTTOM,expand=TRUE,fill="both")

main.resizable(True,True)
main.mainloop()
```

E3: Login Page

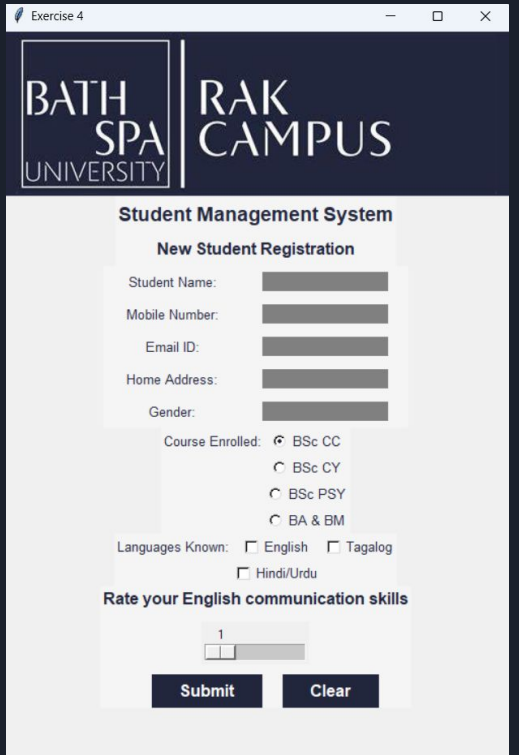
```
# Exercise 3: Login page

# Create a login page using the Grid geometry

import tkinter

from tkinter import *

main = Tk()

main.title('Exercise 3')
main.geometry("220x150")        You, 5 days ago • Completed Exercise 3.py

NL = Label(main,text="First name: ")
NE = Entry(main)
NL.grid(row=0,column=0,padx=5,pady=5)
NE.grid(row=0,column=1,padx=5,pady=5)

SL = Label(main,text="Surname: ")
SE = Entry(main)
SL.grid(row=1, column=0,padx=5,pady=5)
SE.grid(row=1, column=1,padx=5,pady=5)

EL = Label(main,text="Email: ")
EE = Entry(main)
EL.grid(row=2,column=0,padx=5,pady=5)
EE.grid(row=2, column=1,padx=5,pady=5)

Submit = Button(main,text="Submit",padx=5,pady=5,bg="#22263d",fg="white")
Submit.grid(columnspan=5,pady=10)

main.mainloop()
```



E4: Registration Page

```
# Exercise 4: Registration Page

# Use widgets to create a GUI

import tkinter
from tkinter import *
from PIL import Image, ImageTk
import os
    ""
main = Tk()
main.title("Exercise 4")

Banner = ImageTk.PhotoImage(Image.open("Python-Assessments-1-GitHub/Chapter II/RAK_Bathspa.jpg"))

Heading = Label(main,image=Banner,bg="#22263d")
Heading.pack(side=TOP,fill=BOTH,expand=NO)

Framehead = Frame(main,bg="#f5f5f6")
Framehead.pack()

Header = Label(Framehead,text="Student Management System",font=("Arial",14,"bold"),fg="#22263d",bg="#f5f5f6",padx=5)
Header2 = Label(Framehead,text="New Student Registration",font=("Arial",12,"bold"),fg="#22263d",bg="#f5f5f6",padx=5)
Header.pack()
Header2.pack()

Framebody = Frame(main,bg="#f5f5f6")
Framebody.pack()

Framecourses = Frame(main,bg="#f5f5f6")
Framecourses.pack()

Courses = Label(Framecourses,text="Course Enrolled:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")

Courses.grid(row=0,column=0)

V = StringVar(Framecourses, "1")

Variablecourses = {"BSc CC" : "1",
        "BSc CY" : "2",
        "BSc PSY" : "3",
        "BA & BM" : "4"}

for (text,value) in Variablecourses.items():
    Radiobutton(Framecourses,text="BSc CC",variable=V,value=1,font=("Arial",10),fg="#22263d",bg="#f5f5f6").grid(row=0,column=1)
    Radiobutton(Framecourses,text="BSc CY",variable=V,value=2,font=("Arial",10),fg="#22263d",bg="#f5f5f6").grid(row=1,column=1)
    Radiobutton(Framecourses,text="BSc PSY",variable=V,value=3,font=("Arial",10),fg="#22263d",bg="#f5f5f6").grid(row=2,column=1)
    Radiobutton(Framecourses,text="BA & BM",variable=V,value=4,font=("Arial",10),fg="#22263d",bg="#f5f5f6").grid(row=3,column=1)

Framelanguage = Frame(main,bg="#f5f5f6")
Framelanguage.pack()

Languages = Label(Framelanguage,text="Languages Known:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Languages.grid(row=0,column=0)

Button1 = IntVar()
Button2 = IntVar()
Button3 = IntVar()

English = Checkbutton(Framelanguage,text="English",variable=Button1,font=("Arial",10),fg="#22263d",bg="#f5f5f6")
English.grid(row=0,column=1)
Tagalog = Checkbutton(Framelanguage,text="Tagalog",variable=Button2,font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Tagalog.grid(row=0,column=2)
Indian = Checkbutton(Framelanguage,text="Hindi/Urdu",variable=Button3,font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Indian.grid(row=1,column=1)

Framescalet = Frame(main,bg="#f5f5f6")      You, 3 days ago • Finished Exercise 4.py
Framescalet.pack()
```

```
Framebody = Frame(main,bg="#f5f5f6")
Framebody.pack()

Name = Label(Framebody,text="Student Name:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Namentry = Entry(Framebody,bg="grey",relief=FLAT)
Mobile = Label(Framebody,text="Mobile Number:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Mobilentry = Entry(Framebody,bg="grey",relief=FLAT)
Email = Label(Framebody,text="Email ID:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Emailentry = Entry(Framebody,bg="grey",relief=FLAT)
Address = Label(Framebody,text="Home Address:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Addressentry = Entry(Framebody,bg="grey",relief=FLAT)
Gender = Label(Framebody,text="Gender:",font=("Arial",10),fg="#22263d",bg="#f5f5f6")
Genderentry = Entry(Framebody,bg="grey",relief=FLAT)

Name.grid(row=0,column=0,padx=20,pady=5)
Namentry.grid(row=0,column=1,pady=5)
Mobile.grid(row=1,column=0,padx=20,pady=5)
Mobilentry.grid(row=1,column=1,pady=5)
Email.grid(row=2,column=0,padx=20,pady=5)
Emailentry.grid(row=2,column=1,pady=5)
Address.grid(row=3,column=0,padx=20,pady=5)
Addressentry.grid(row=3,column=1,pady=5)
Gender.grid(row=4,column=0,padx=20,pady=5)
Genderentry.grid(row=4,column=1,padx=20,pady=5)


Framecourses = Frame(main,bg="#f5f5f6")
Framecourses.pack()

Hmm = Label(Framescalet,text="Rate your English communication skills",font=("Arial",12,"bold"),fg="#22263d",bg="#f5f5f6")

Hmm.pack()


Scalet = Scale(Framescalet,from_=1,to=100,orient=HORIZONTAL)
Scalet.pack(pady=10)


Framebuttons = Frame(Framescalet,bg="#f5f5f6")
Framebuttons.pack()


Submit = Button(Framebuttons,text="Submit",font=("Arial",12,"bold"),fg="white",bg="#22263d",relief=FLAT)
Clear = Button(Framebuttons,text="Clear",font=("Arial",12,"bold"),fg="white",bg="#22263d",relief=FLAT)
Submit.grid(row=0,column=0,padx=20,ipadx=20)
Clear.grid(row=0,column=1,ipadx=20)


main.geometry("500x900")

main.mainloop()
```

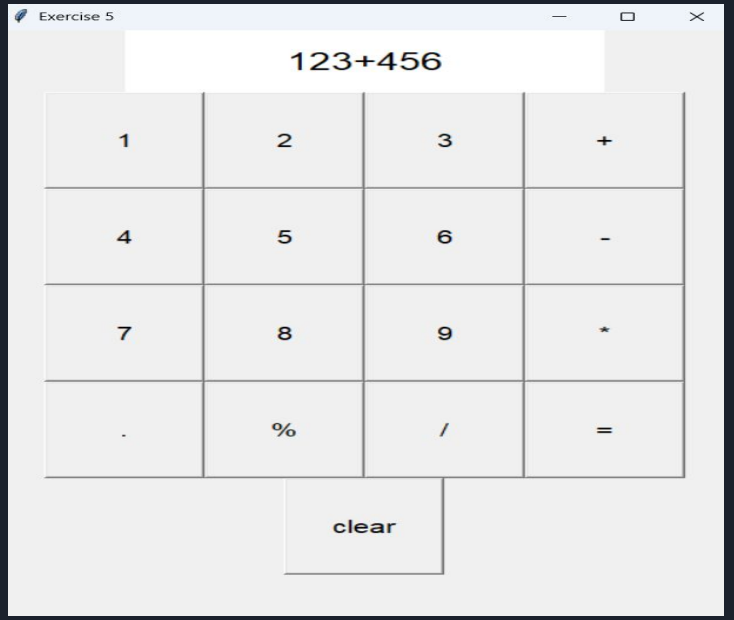


E5: Calculator

```
import tkinter
from tkinter import *

def button_press(num):
    global texquation

    texquation = texquation + str(num)

    labequation.set(texquation)

def equals():
    try:
        global texquation

        total = str(eval(texquation))

        labequation.set(total)

        texquation = total

    except SyntaxError:
        labequation.set("Syntax Error")

        texquation = ""
```

```
def clear():
    global texquation

    labequation.set("")

    texquation = ""

main = Tk()

main.title("Exercise 5")
main.geometry("500x1000")

texquation = ""

labequation = StringVar()

label = Label(main, textvariable=labequation, font=('Helvetica',20), bg="white", width=20, height=2)
label.pack()

frame = Frame(main)
frame.pack()

button1 = Button(frame, text=1, height=4, width=9, font=35, command=lambda: button_press(1))
button1.grid(row=0,column=0)

button2 = Button(frame, text=2, height=4, width=9, font=35, command=lambda: button_press(2))
button2.grid(row=0,column=1)

button3 = Button(frame, text=3, height=4, width=9, font=35, command=lambda: button_press(3))
button3.grid(row=0,column=2)

button4 = Button(frame, text=4, height=4, width=9, font=35, command=lambda: button_press(4))
button4.grid(row=1,column=0)

button5 = Button(frame, text=5, height=4, width=9, font=35, command=lambda: button_press(5))
button5.grid(row=1,column=1)

button6 = Button(frame, text=6, height=4, width=9, font=35, command=lambda: button_press(6))
button6.grid(row=1,column=2)
```

```
button7 = Button(frame, text=7, height=4, width=9, font=35, command=lambda: button_press(7))
button7.grid(row=2,column=0)

button8 = Button(frame, text=8, height=4, width=9, font=35, command=lambda: button_press(8))
button8.grid(row=2,column=1)

button9 = Button(frame, text=9, height=4, width=9, font=35, command=lambda: button_press(9))
button9.grid(row=2,column=2)

button0 = Button(frame, text=0, height=4, width=9, font=35, command=lambda: button_press(0))
button0.grid(row=3,column=1)

plus = Button(frame, text='+', height=4, width=9, font=35, command=lambda: button_press('+'))
plus.grid(row=0,column=3)

minus = Button(frame, text='-', height=4, width=9, font=35, command=lambda: button_press('-'))
minus.grid(row=1,column=3)

multiply = Button(frame, text='*', height=4, width=9, font=35, command=lambda: button_press('*'))
multiply.grid(row=2,column=3)

divide = Button(frame, text='/', height=4, width=9, font=35, command=lambda: button_press('/'))
divide.grid(row=3,column=2)

decimal = Button(frame, text='.', height=4, width=9, font=35, command=lambda: button_press('.'))
decimal.grid(row=3,column=0)

modulate = Button(frame, text='%', height=4, width=9, font=35, command=lambda: button_press('%'))
modulate.grid(row=3,column=1)

equal = Button(frame, text='=', height=4, width=9, font=35, command=equals)
equal.grid(row=3,column=3)

clearing = Button(main, text='clear', height=4, width=9, font=35)
clearing.pack()

main.mainloop()
```

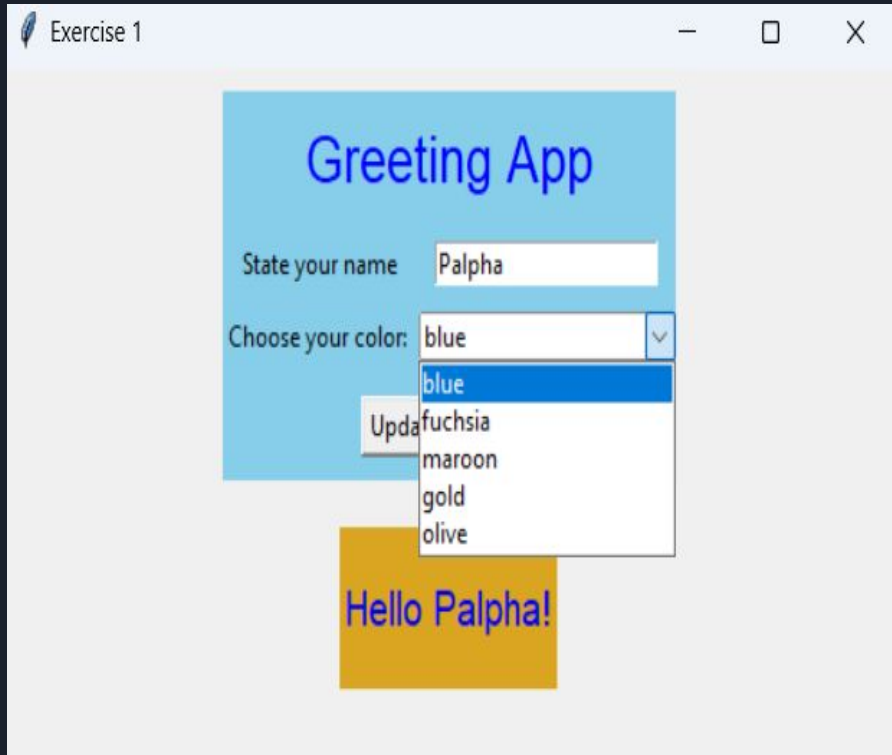


Chapter III
Graphical User Interface (cont.)

E1: Greeting App

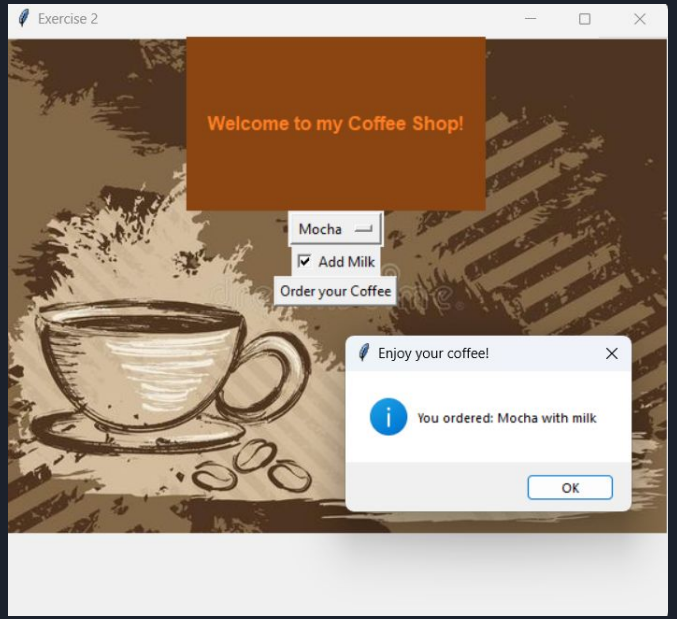
```
# Exercise 1: Greeting App

# Develop a GUI to greet the user. The app should have two frames: InputFrame and DisplayFrame.

import tkinter

from tkinter import *

from tkinter import ttk

main = Tk()

def update_greeting():
    name = name_entry.get()
    color = colovar.get()
    greeting_label.config(text="Hello " + name + "!",fg=color)

main.title('Exercise 1')
main.geometry('500x500')

Finput = Frame(main,bg='skyblue')
Finput.pack(pady=10)

Fisplay = Frame(main,bg='goldenrod')
Fisplay.pack(pady=10)

Tabel = Label(Finput,text="Greeting App",fg='blue',font=("Helvetica",20),bg="skyblue")
Tabel.grid(row=0,column=0,columnspan=2,pady=10)

Nabel = Label(Finput,text="State your name",bg='skyblue')
Nabel.grid(row=1,column=0,pady=5)      You, last week • Updating Exercise 1.py

name_entry = Entry(Finput)
name_entry.grid(row=1,column=1,pady=5)

Cabel = Label(Finput,text="Choose your color: ",bg='skyblue')
Cabel.grid(row=2,column=0,pady=5)
```

```
colors = ['blue','fuchsia','maroon','gold','olive']
colovar = StringVar()
coloropdown = ttk.Combobox(Finput,textvariable=colovar, values=colors,state="readonly")
coloropdown.current(0)
coloropdown.grid(row=2,column=1,pady=5)

update = Button(Finput,text="Update Greeting", command=update_greeting)
update.grid(row=3,column=0,columnspan=2,pady=10)

greeting_label = Label(Fisplay,text="",font=("Helvetica",15),bg='goldenrod')
greeting_label.pack(pady=20)

main.mainloop()
```



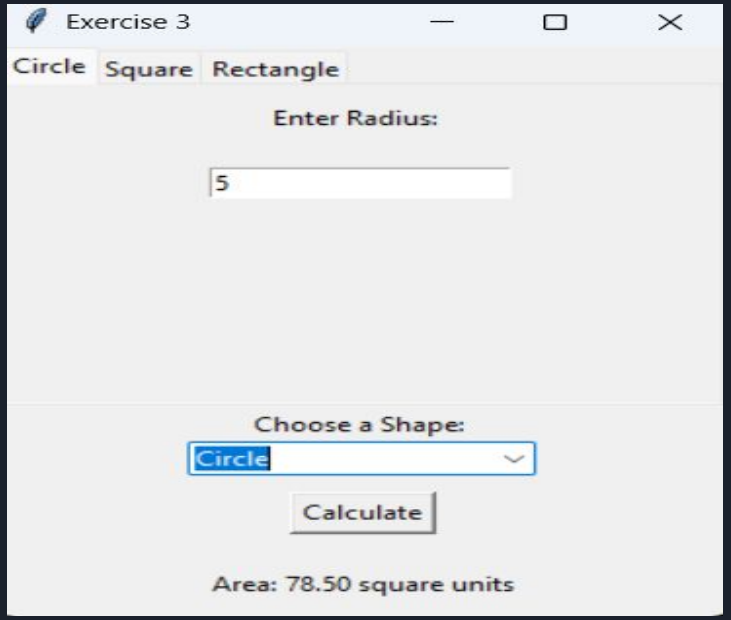
E2: Coffee Vending Machine

```python
# Exercise 2: Coffee Vending Machine

# Develop a coffee Vending Machine that asks users to select the type of coffee, and also prompts user
# Extension: Add other features to the previous app such as handling money.

import tkinter
from tkinter import *
from PIL import Image, ImageTk
from tkinter import messagebox

main = Tk()

main.title('Exercise 2')
main.geometry('500x500')
    You, last week • Errors of Chapter 3
Background = ImageTk.PhotoImage(Image.open("Chapter III/Coffee background.png"))

bg = Label(main,image=Background)
bg.place(x=0,y=0)

Greeting = Label(main,text="Welcome to my Coffee Shop!",font=('Helvetica',12,'bold'),bg='#884513',fg=
Greeting.pack()

coffeetype = ["Capuccchino","Latte","Espresso","Mocha","Americano"]
coffvar = StringVar(main)
coffvar.set(coffeetype[0])
dropdown = OptionMenu(main,coffvar,*coffeetype)
dropdown.pack()

milkar = IntVar(value=0)
checkbox = Checkbutton(main,text="Add Milk",variable=milkar)
checkbox.pack()

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def order():
    coffee = coffvar.get()
    havemilk = "with milk" if milkar.get() == 1 else ""
    messagebox.showinfo("Enjoy your coffee!", f"You ordered: {coffee} {havemilk}")

orderup = Button(main,text="Order your Coffee",command=order)
orderup.pack()

main.mainloop()
```



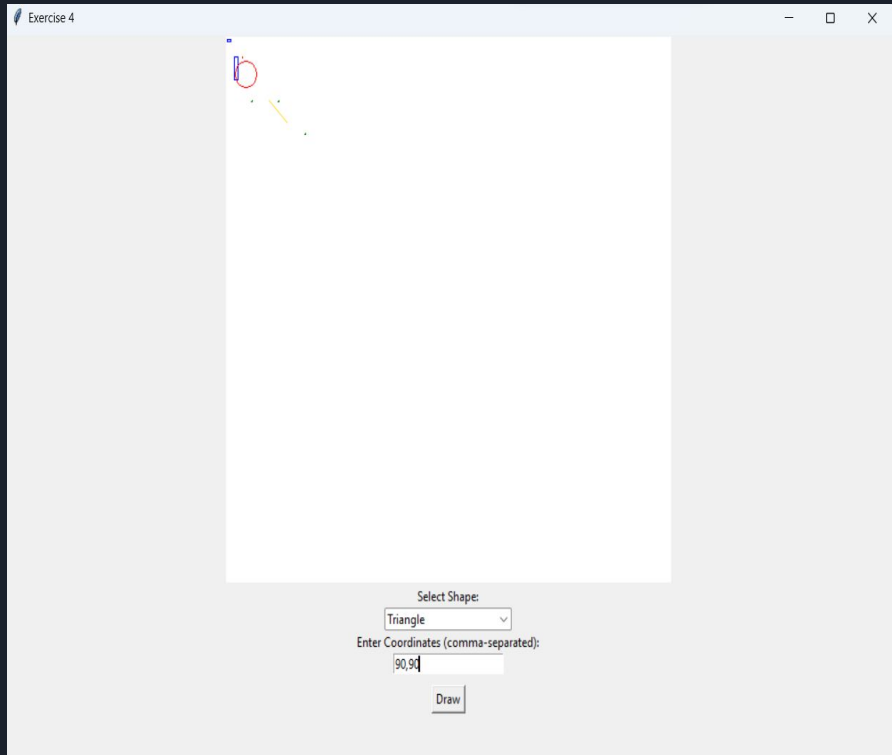
E3: Area Function

```
# Develop a GUI application using tkinter that allows users to calculate and display the areas of various shapes
# including circles, squares, and rectangles

import tkinter
from tkinter import *
from tkinter import ttk,messagebox

def calculate_area():
    try:
        if selected.get() == "Circle":
            radius = float(radiusentry.get())
            area = 3.14 * radius**2
        elif selected.get() == "Square":
            side = float(sidentry.get())
            area = side**2
        elif selected.get() == "Rectangle":
            length = float(lengthentry.get())
            width = float(widthentry.get())
            area = length * width
        else:
            messagebox.showerror("That's not a shape...")
            return

        resultabel.config(text=f"Area: {area:.2f} square units")
    except ValueError:
        messagebox.showerror("Is that a dimension?")

main = Tk()
main.title("Exercise 3")
main.geometry("300x350")

tab = ttk.Notebook(main)

circle = Frame(tab)
square = Frame(tab)
rectangle = Frame(tab)

tab.add(circle,text="Circle")
tab.add(square,text="Square")
tab.add(rectangle,text="Rectangle")

tab.pack(expand=3,fill=BOTH)

selected = StringVar(value="Square")
shabel = Label(main,text="Choose a Shape: ")
shabel.pack()
shapelection = ttk.Combobox(main,textvariable=selected,values=["Circle","Square","Rectangle"])
shapelection.pack()

# This is a circle

radiusabel = Label(circle,text="Enter Radius: ")
radiusabel.pack(pady=10)
radiusentry = Entry(circle)
radiusentry.pack(pady=10)

# This is a square

sideabel = Label(square,text="Enter the Length of the Side: ")
sideabel.pack(pady=10)
sidentry = Entry(square)
sidentry.pack(pady=10)

# This is a rectangle

lengthabel = Label(rectangle,text="Enter the Length: ")
lengthabel.pack(pady=10)
lengthentry = Entry(rectangle)
lengthentry.pack(pady=10)

widthabel = Label(rectangle,text="Enter the Width: ")
widthabel.pack(pady=10)
widthentry = Entry(rectangle)      You, 5 hours ago • Finished the  cursed chapters
widthentry.pack(pady=10)
calculate = Button(main,text="Calculate",command=calculate_area)
calculate.pack(pady=10)


resultabel = Label(main,text="The Area is: ")
resultabel.pack(pady=10)

main.mainloop()
```



E4: Draw Shapes

```python
# Exercise 4: Draw Shape

# Using tkinter module develop GUI to ask the user to select shapes like
# oval, rectangle, square, triangle
# and draw the shape using canvas

import tkinter
from tkinter import *
from tkinter import ttk, messagebox

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def draw_shape():
    try:
        selected = shapeselection.get()
        coordinates = coordinatentry.get()
        coordinatelist = [int(coord.strip()) for coord in coordinates.split(',')]

        if selected == "Star":
            canvas.create_polygon(coordinatelist,outline='gold')
        elif selected == "Square":
            canvas.create_rectangle(coordinatelist,outline='blue')
        elif selected == "Circle":
            canvas.create_oval(coordinatelist,outline='red')
        elif selected == "Triangle":
            canvas.create_polygon(coordinatelist,outline='green')
        else:
            messagebox.showerror("Nope","Please choose a valid shape")
            return
    except ValueError:
        messagebox.showerror("Where are you going?","Please enter valid coordinates")

main = Tk()
main.title("Exercise 4")
main.geometry("1000x1000")

canvas = Canvas(main,width=500,height=500,bg='white')
canvas.pack()       You, 8 hours ago • Update Exercise 4.py

shapabel = Label(main,text="Select Shape:")
shapabel.pack()
shapeselection = ttk.Combobox(main, values=["Star","Square","Circle","Triangle"])
shapeselection.pack()

coordinatabel = Label(main,text="Enter Coordinates (comma-separated):")
coordinatabel.pack()
coordinatentry = Entry(main)
coordinatentry.pack()

draw = Button(main,text="Draw",command=draw_shape)
draw.pack(pady=10)

main.mainloop()
```

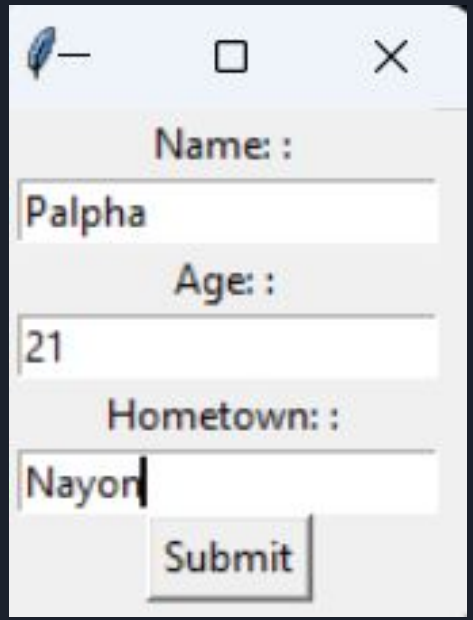


Chapter IV:
File Handling & Regular Expressions

E1: User Information

```python
# Develop a GUI App to create a file called 'bio.txt' and write the following information to the
# Each piece of data should be on a new line. Once the data has been written to the file, read t

import tkinter
from tkinter import *
from tkinter import messagebox

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, 2 days ago | 1 author (You)
class UserInfoApp:
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,main):
        Palpha.main = main
        Palpha.main.title("Exercise 1")

        Palpha.create_input_fields()
        Palpha.create_submit_button()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def create_input_fields(Palpha):
        fields = ["Name: ", "Age: ", "Hometown: "]
        Palpha.entries = {}
        for field in fields:
            Label(Palpha.main,text=field + ": ").pack()
            Palpha.entries[field] = Entry(Palpha.main)
            Palpha.entries[field].pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def create_submit_button(Palpha):
        submitton = Button(Palpha.main,text="Submit",command=Palpha.write_and_read_info)
        submitton.pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def write_and_read_info(Palpha):
        user_info = ""
        for field, entry in Palpha.entries.items():
            value = entry.get()
            user_info += "{field}: {value}"

        with open("Python-Assessments-1-GitHub/Chapter IV/Texts/Bio.txt",'w') as file:
            file.write(user_info)

        with open("Python-Assessments-1-GitHub/Chapter IV/Texts/Bio.txt",'r') as file:
            user_info = file.read()
            messagebox.showinfo("User Information",user_info)

if __name__ == "__main__":
    root = Tk()
    app = UserInfoApp(root)
    root.mainloop()
```

You, 2 days ago • Completing Chapter IV (except Exercise 2.py)



E2: Countstrings

```python
# The file sentences.txt has a list of string data.
# Develop a GUI app that finds out how many times the following string appears

# Hello my name is Peter Parker
# I love Python Programming
# Love
# Enemy

import tkinter
from tkinter import *      You, 2 days ago • IV's exercise 2 is weird

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def count_string_occurrences():
    target_strings = [
        "Hello my name is Peter Parker",
        "I love Python Programming",
        "Love",
        "Enemy"
    ]

with open("Python-Assessments-1-GitHub/Chapter IV/Texts/Sentences.txt",'r') as file:
    data = file.read()

occurrences = (data.count(string) for string in target_strings)
result.config(text="Occurrences: {occurrences}")
```

```python
main = Tk()
main.title("Exercise 2")

instructions = Label(main,text="Count the string occurrences in the file")
instructions.pack()

count = Button(main,text="Count Occurrences",command=count_string_occurrences)
count.pack()

result = Label(main,text="Occurrences: ")

main.mainloop()
```

E3: Reading to a List

```python
# Exercise 3: Reading to a List

# The file numbers.txt has a list of 100 integer numbers each on a newline
# Create a python program that puts this data into a list, then output the values in integer format

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def read_numbers(data_path):

    try:
        with open("Python-Assessments-1-GitHub/Chapter IV/Texts/Numbers.txt","r") as file:
            noombers = [int(line.strip()) for line in file]
        return noombers
    except FileNotFoundError:
        print("Error: File '{data_path}' not found.")
        return []
    except ValueError as e:
        print("Error: {e}. the file '{data_path}' contains non-integer values.")

if __name__ == "__main__":
    data_path = "Python-Assessments-1-GitHub/Chapter IV/Texts/Numbers.txt"

    noomberlist = read_numbers(data_path)

    for noombers in noomberlist:
        print(noombers)
```

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
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79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
```
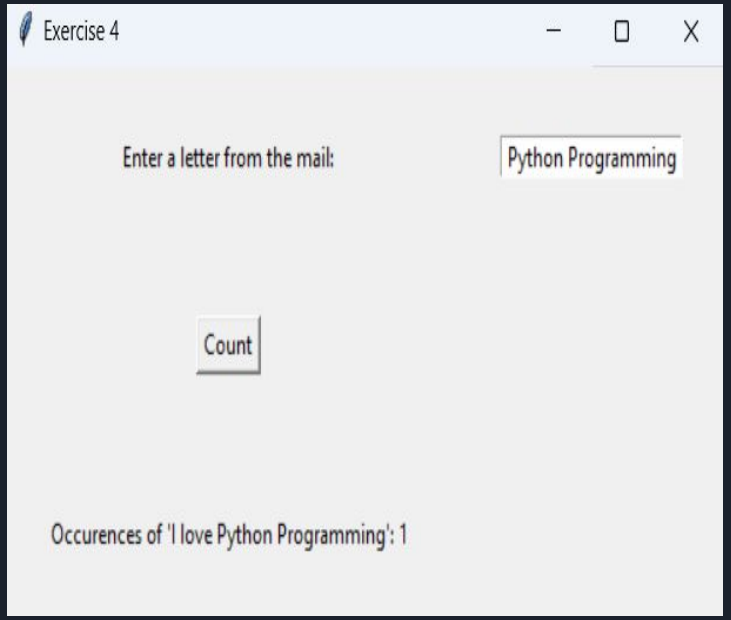

E4: Letter Count

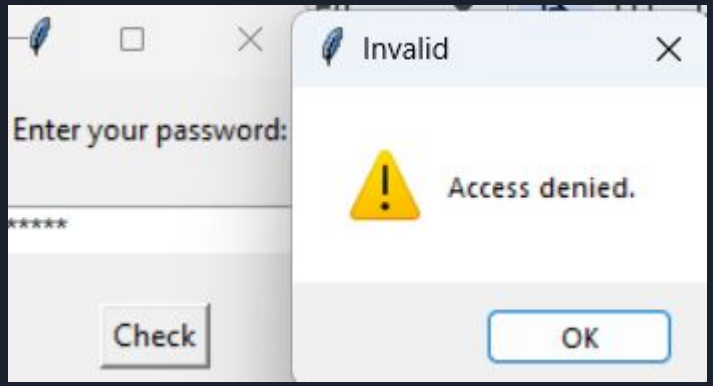
```python
# Develop a GUI App that asks the user to enter a character
# reads the contents of the sentences.txt file
# and counts the occurrences of the letter.

import tkinter
from tkinter import *
from tkinter import messagebox

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def counting_letter_occurences(letter,content):
    return content.lower().count(letter.lower())

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def read_file(mail_path):
    try:
        with open(mail_path,'r') as file:
            return file.read()
    except FileNotFoundError:
        return None

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def show_letter_count():
    letter = mail.get()
    if not letter:
        messagebox.showinfo("Error", "Where is the letter for your mail?")
        return

    file_content = read_file('Python-Assessments-1-GitHub/Chapter IV/Texts/Sentences.txt')
    if file_content is None:
        messagebox.showinfo("Error", "File 'Python-Assessments-1-GitHub/Chapter IV/Texts/Sentences.txt

    occurences = counting_letter_occurences(letter,file_content)
    resultabel.config(text=f"Occurences of '{letter}': {occurences}")

app = Tk()
app.title("Exercise 4")

mailabel = Label(app,text="Enter a letter from the mail:")
mail = Entry(app)
submitton = Button(app,text="Count",command=show_letter_count)
resultabel = Label(app,text="")

mailabel.grid(row=0,column=0,padx=30,pady=30)
mail.grid(row=0,column=1,padx=30,pady=30)
submitton.grid(row=1,column=0,padx=30,pady=30)
resultabel.grid(row=2,column=0,padx=30,pady=30)

app.mainloop()
```



E5: Password Check

```
# The password should satisfy the following criteria:

# Contain at least 1 letter between a and z
# Contain at least 1 number between 0 and 9
# Contain at least 1 letter between A and Z
# Contain at least 1 character from $, #, @
# Minimum length of password: 6
# Maximum length of password: 12

# Ask user to include a maximum of 5 passcode attempts
# Each time the user enters an incorrect passcode, they
# If there are 5 failed passcode attempts the while loo

import tkinter
from tkinter import *
from tkinter import messagebox
import re

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def is_valid_password(password):
    if (6<=len(password)<=12 and
        re.search("[a-z]",password)and
        re.search("[0-9]",password)and
        re.search("[A-Z]",password)and
        re.search("[$#@]",password)):
        return True
    return False
```

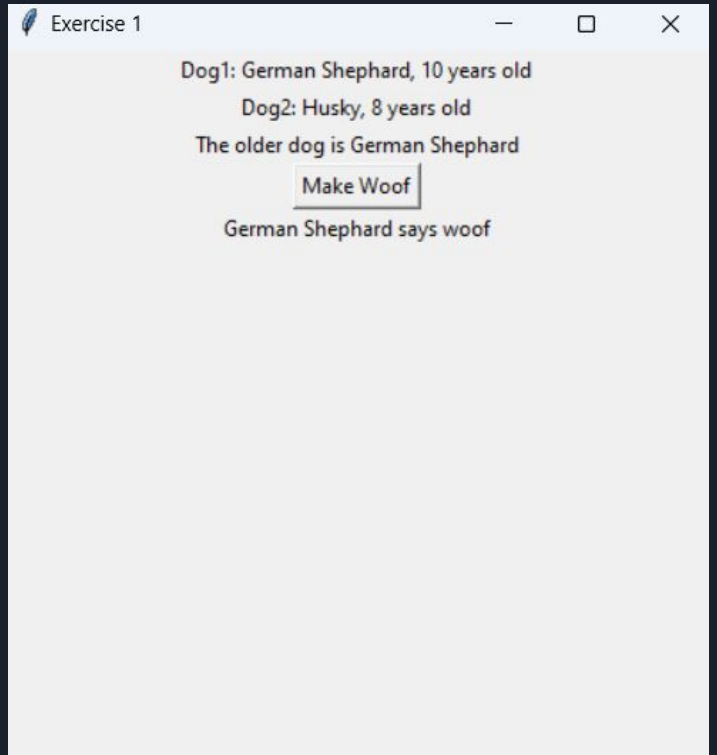
```
Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def check_password():
    entered_password = pentry.get()

    if is_valid_password(entered_password):
        messagebox.showinfo("Valid","Access granted!")
    else:
        messagebox.showwarning("Invalid","Access denied.")

app = Tk()
app.title("Exercise 5")

pabel = Label(app,text="Enter your password: ")
pentry = Entry(app,show="*")
checkon = Button(app,text="Check",command=check_password)

pabel.pack(pady=10)
pentry.pack(pady=10)
checkon.pack(pady=10)

app.mainloop()
```



Chapter V: Object Oriented Programming

E1: Woof Woof

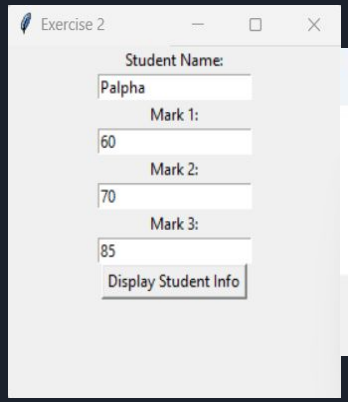
```python
# Exercise 1: Woof Woof
# Develop a GUI using Tkinter with a class that de

import tkinter as tk

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You,
class Dog:
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha, name, age):
        Palpha.name = name
        Palpha.age = age

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def woof(Palpha):
        return f"{Palpha.name} says woof"

dog1 = Dog("German Shephard", 10)
dog2 = Dog("Husky", 8)
older_dog = dog1 if dog1.age > dog2.age else dog2

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You,
class DogGUI(tk.Tk):
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha):
        super().__init__()
        Palpha.title("Exercise 1")      You, 1 sec
        Palpha.geometry("400x400")
        Palpha.display_dog_info()
    def display_dog_info(Palpha):
        label1 = tk.Label(Palpha, text=f"Dog1: {dog1.name}, {dog1.age} years old")
        label1.pack()
        label2 = tk.Label(Palpha, text=f"Dog2: {dog2.name}, {dog2.age} years old")
        label2.pack()
        older_dog_label = tk.Label(Palpha, text=f"The older dog is {older_dog.name}")
        older_dog_label.pack()
        woof_button = tk.Button(Palpha, text="Make Woof", command=Palpha.make_woof)
        woof_button.pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def make_woof(Palpha):
        result = older_dog.woof()
        woof_label = tk.Label(Palpha, text=result)
        woof_label.pack()

app = DogGUI()
app.mainloop()
```

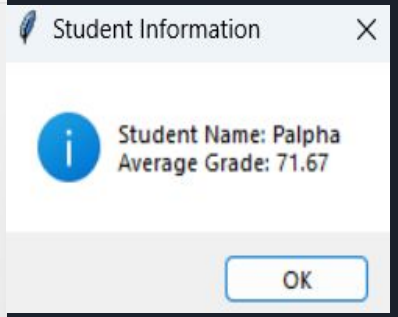


E2: Student Class

```python
import tkinter as tk
from tkinter import messagebox


Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, yesterday | 1 author (You)
class Student:
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,name,mark1,mark2,mark3):
        Palpha.name = name
        Palpha.mark1 = mark1
        Palpha.mark2 = mark2
        Palpha.mark3 = mark3


    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def calc_grade(Palpha):
        average = (Palpha.mark1 + Palpha.mark2 + Palpha.mark3) / 3
        return round(average, 2)
```

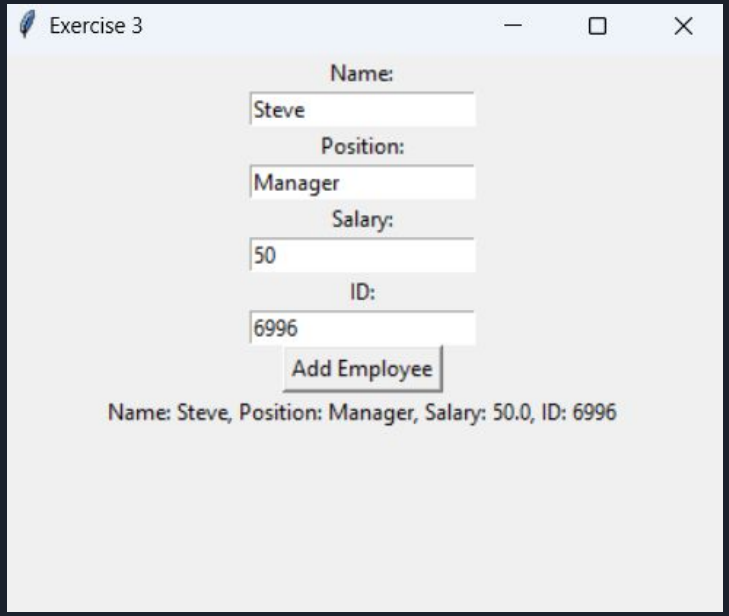
```python
    def calc_grade(Palpha):
        average = (Palpha.mark1 + Palpha.mark2 + Palpha.mark3) / 3
        return round(average, 2)

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, yesterday | 1 author (You)
class StudentGUI:
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,score):
        Palpha.score = score
        Palpha.score.title("Exercise 2")

        tk.Label(score,text="Student Name:").pack()
        Palpha.name_entry = tk.Entry(score)
        Palpha.name_entry.pack()

        tk.Label(score,text="Mark 1:").pack()
        Palpha.mark1_entry = tk.Entry(score)
        Palpha.mark1_entry.pack()

        tk.Label(score,text="Mark 2:").pack()
        Palpha.mark2_entry = tk.Entry(score)
        Palpha.mark2_entry.pack()

        tk.Label(score,text="Mark 3:").pack()
        Palpha.mark3_entry = tk.Entry(score)
        Palpha.mark3_entry.pack()

        Palpha.display_button = tk.Button(score,text="Display Student Info",command=Palpha.display_stu
        Palpha.display_button.pack()
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def display_student_info(Palpha):
        name = Palpha.name_entry.get()
        mark1 = int(Palpha.mark1_entry.get())
        mark2 = int(Palpha.mark2_entry.get())
        mark3 = int(Palpha.mark3_entry.get())

        if name and mark1 and mark2 and mark3:
            student = Student(name,mark1,mark2,mark3)
            average_grade = student.calc_grade()
            message = f"Student Name: {student.name}\nAverage Grade: {average_grade}"
            messagebox.showinfo("Student Information",message)
        else:
            messagebox.showerror("Error", "Please fill in all the fields.")

if __name__ == "__main__":
    main = tk.Tk()
    app = StudentGUI(main)
    main.mainloop()
```





E3: Employee Class

```python
import tkinter as tk

from tkinter import *

class Employee:
    def __init__(Palpha):
        Palpha.name = ""
        Palpha.position = ""
        Palpha.salary = 0.0
        Palpha.id = ""

    def set_data(Palpha, name, position, salary, id):
        Palpha.name = name
        Palpha.position = position
        Palpha.salary = salary
        Palpha.id = id

    def get_data(Palpha):
        return f"Name: {Palpha.name}, Position: {Palpha.position}, Salary: {Palpha.salary}, ID: {Palpha.id}"

class EmployeeGUI(tk.Tk):
    def __init__(Palpha):
        super().__init__()
        Palpha.title("Exercise 3")
        Palpha.geometry("400x400")
        Palpha.employees = []
        Palpha.create_input_fields()
        Palpha.create_display_button()

    def create_input_fields(Palpha):
        Palpha.name_label = tk.Label(Palpha, text="Name:")
        Palpha.name_entry = tk.Entry(Palpha)
        Palpha.name_label.pack()
        Palpha.name_entry.pack()

        Palpha.position_label = tk.Label(Palpha, text="Position:")
        Palpha.position_entry = tk.Entry(Palpha)
        Palpha.position_label.pack()
        Palpha.position_entry.pack()

        Palpha.salary_label = tk.Label(Palpha, text="Salary:")
        Palpha.salary_entry = tk.Entry(Palpha)
        Palpha.salary_label.pack()
        Palpha.salary_entry.pack()

        Palpha.id_label = tk.Label(Palpha, text="ID:")
        Palpha.id_entry = tk.Entry(Palpha)
        Palpha.id_label.pack()
        Palpha.id_entry.pack()

    def create_display_button(Palpha):
        Palpha.display_button = tk.Button(Palpha, text="Add Employee", command=Palpha.add_employee)
        Palpha.display_button.pack()

    def add_employee(Palpha):
        name = Palpha.name_entry.get()
        position = Palpha.position_entry.get()
        salary = float(Palpha.salary_entry.get())
        id = Palpha.id_entry.get()

        employee = Employee()
        employee.set_data(name, position, salary, id)
        Palpha.employees.append(employee)
        Palpha.display_employees()

    def display_employees(Palpha):
        Palpha.display_frame = tk.Frame(Palpha)
        Palpha.display_frame.pack()

        for employee in Palpha.employees:
            employee_label = tk.Label(Palpha.display_frame, text=employee.get_data())
            employee_label.pack()

app = EmployeeGUI()
app.mainloop()
```

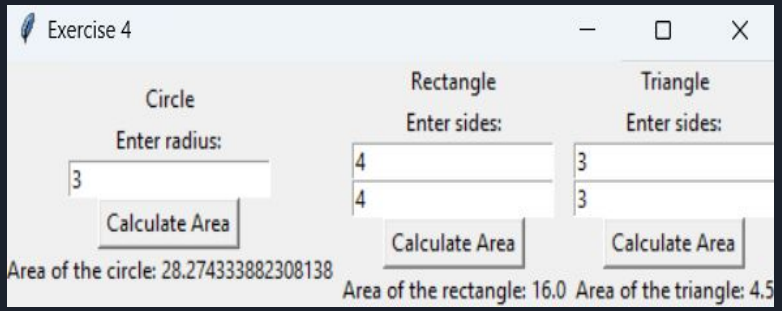


E4: Shapes

```
import tkinter as tk
import math

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, 2 days ago | 1 author (You)
class Shape:
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,shaper):        You, 2 days ago • Finished the  cursed ch
        Palpha.shaper = shaper

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def input_sides(Palpha):
        Palpha.sidelabel = tk.Label(Palpha.shaper,text="Enter sides:")
        Palpha.sidelabel.pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def input_radius(Palpha):
        Palpha.radiuslabel = tk.Label(Palpha.shaper,text="Enter radius:")
        Palpha.radiuslabel.pack()

main = tk.Tk()
main.title("Exercise 4")

circleframe = tk.Frame(main)
circleframe.pack(side=tk.LEFT)
circlelabel = tk.Label(circleframe, text="Circle")
circlelabel.pack()
circle = Circle(circleframe)

rectangleframe = tk.Frame(main)
rectangleframe.pack(side=tk.LEFT)
rectanglelabel = tk.Label(rectangleframe, text="Rectangle")
rectanglelabel.pack()
rectangle = Rectangle(rectangleframe)

triangleframe = tk.Frame(main)
triangleframe.pack(side=tk.LEFT)
trianglelabel = tk.Label(triangleframe, text="Triangle")
trianglelabel.pack()
triangle = Triangle(triangleframe)

main.mainloop()
```

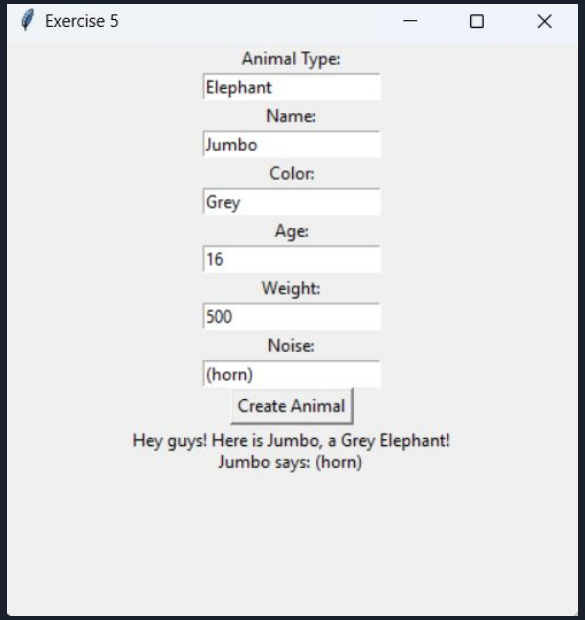
```
class Circle(Shape):
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,shaper):
        super().__init__(shaper)
        Palpha.input_radius()
        Palpha.radiusentry = tk.Entry(Palpha.shaper)
        Palpha.radiusentry.pack()
        Palpha.calculate = tk.Button(Palpha.shaper,text="Calculate Area",command=Palpha.calculate_area)
        Palpha.calculate.pack()        You, 2 days ago • Finished the  cursed chapters

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def calculate_area(Palpha):
        radius = float(Palpha.radiusentry.get())
        area = math.pi * (radius**2)
        resultlabel = tk.Label(Palpha.shaper,text="Area of the circle: {area}")
        resultlabel.pack()

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, 2 days ago | 1 author (You)
class Rectangle(Shape):
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,shaper):
        super().__init__(shaper)
        Palpha.input_sides()
        Palpha.lengthentry = tk.Entry(Palpha.shaper)
        Palpha.lengthentry.pack()
        Palpha.widthentry = tk.Entry(Palpha.shaper)
        Palpha.widthentry.pack()
        Palpha.calculate = tk.Button(Palpha.shaper,text="Calculate Area",command=Palpha.calculate_area)
        Palpha.calculate.pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def calculate_area(Palpha):
        length = float(Palpha.lengthentry.get())
        width = float(Palpha.widthentry.get())
        area = length * width
        resultlabel = tk.Label(Palpha.shaper,text="Area of the rectangle: {area}")
        resultlabel.pack()
```

```
Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
class Triangle(Shape):
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,shaper):
        super().__init__(shaper)
        Palpha.input_sides()
        Palpha.baseentry = tk.Entry(Palpha.shaper)
        Palpha.baseentry.pack()
        Palpha.heightentry = tk.Entry(Palpha.shaper)
        Palpha.heightentry.pack()
        Palpha.calculate = tk.Button(Palpha.shaper, text='Calculate Area', command=Palpha.calculate_area
        Palpha.calculate.pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def calculate_area(Palpha):
        base = float(Palpha.baseentry.get())
        height = float(Palpha.heightentry.get())
        area = 0.5 * base * height
        resultlabel = tk.Label(Palpha.shaper, text=f'Area of the triangle: {area}')
        resultlabel.pack()
```



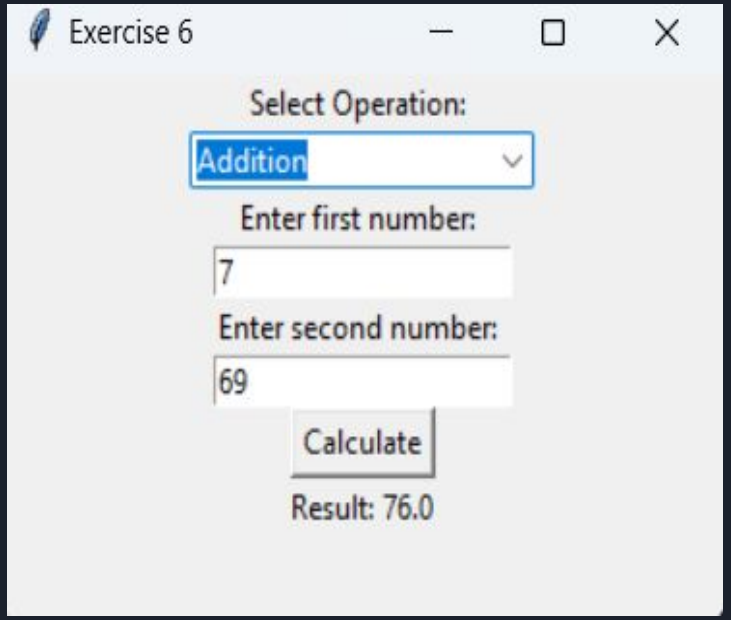
E5: Playing around in class

```python
# Exercise 5: Playing around in class

# Use this exercise to play around with creating and accessing class members and methods.
# Develop a GUI using Tkinter to Create a class called Animal

import tkinter as tk

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, 2 days ago | 1 author (You)
class Animal:
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha,animal_type,name,color,age,weight,noise):
        Palpha.type = animal_type
        Palpha.name = name
        Palpha.color = color
        Palpha.age = age
        Palpha.weight = weight
        Palpha.noise = noise

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def say_hello(Palpha):
        return f"Hey guys! Here is {Palpha.name}, a {Palpha.color} {Palpha.type}!"

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def make_noise(Palpha):
        return f"{Palpha.name} says: {Palpha.noise}"

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, 2 days ago | 1 author (You)
class AnimalGUI(tk.Tk):
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha):
        super().__init__()
        Palpha.title("Exercise 5")
        Palpha.geometry("400x400")

        Palpha.create_widgets()

    def create_widgets(Palpha):
        labels = ["Animal Type","Name","Color","Age","Weight","Noise"]
        entries = []

        for label in labels:
            new_label = tk.Label(Palpha, text=label + ":")
            new_label.pack()
            new_entry = tk.Entry(Palpha)
            new_entry.pack()
            entries.append(new_entry)

        button_create = tk.Button(Palpha, text="Create Animal", command=lambda: Palpha.create_animal(*[entry.get() for entry in entries]))
        button_create.pack()

        Palpha.result_label = tk.Label(Palpha, text="")
        Palpha.result_label.pack()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def create_animal(Palpha,animal_type,name,color,age,weight,noise):
        try:
            age = int(age)
            weight = float(weight)
            animal = Animal(animal_type,name,color,age,weight,noise)

            result_text = animal.say_hello() + "\n" + animal.make_noise()
            Palpha.result_label.config(text=result_text)
        except ValueError:
            Palpha.result_label.config(text="Nope. Please enter a valid age and weight")

app = AnimalGUI()
app.mainloop()
```



E6: Arithmetic Operations

```
# a function Calculate() - To perform an arithmetic operation selected by the u
# You can use Combobox to provide users with options to perform selected arithm
    You, 17 hours ago • Updating Chapter V
import tkinter
from tkinter import *
from tkinter import ttk


Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery | You, 2 days ago | 1 author (You)
class ArithmeticOperations(Tk):
    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def __init__(Palpha):
        super().__init__()
        Palpha.title("Exercise 6")
        Palpha.geometry("300x200")

        Palpha.result = 0

        Palpha.create_widgets()

    Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
    def create_widgets(Palpha):
        Palpha.operation_label = Label(Palpha,text="Select Operation: ")
        Palpha.operation_label.pack()
        Palpha.operations = ttk.Combobox(Palpha,values=["Addition","Subtraction","Multiplication","Division"])
        Palpha.operations.pack()

        Palpha.num1_label = Label(Palpha,text="Enter first number: ")
        Palpha.num1_label.pack()
        Palpha.num1_entry = Entry(Palpha)
        Palpha.num1_entry.pack()

        Palpha.num2_label = Label(Palpha,text="Enter second number: ")
        Palpha.num2_label.pack()
        Palpha.num2_entry = Entry(Palpha)
        Palpha.num2_entry.pack()

        Palpha.calculate_button = Button(Palpha,text="Calculate",command=Palpha.calculate)
        Palpha.calculate_button.pack()

        Palpha.result_label = Label(Palpha,text="")
        Palpha.result_label.pack()
    def calculate(Palpha):
        operation = Palpha.operations.get()
        num1 = float(Palpha.num1_entry.get())
        num2 = float(Palpha.num2_entry.get())

        if operation == "Addition":
            Palpha.result = num1 + num2
        elif operation == "Subtraction":
            Palpha.result = num1 - num2
        elif operation == "Multiplication":
            Palpha.result = num1 * num2      You, 2 days ago • Finish
        elif operation == "Division":
            if num2 != 0:
                Palpha.result = num1 / num2
            else:
                Palpha.result = "Undefined (Division by zero)"

        Palpha.result_label.config(text=f"Result: {Palpha.result}")

app = ArithmeticOperations()
app.mainloop()
```



Chapter VI:
Python Standard Library

E1: Basic Math

```python
# Exercise 1: Basic Math       You, last we

# Using math module compute the following

# For a =2.3 find the ceil of a
# For a =2.3 find the floor of a
# For a = 5 find the factorial of a
# Find the value of 2^3
# For a=16 find the square root of a

import math

# 1: Ceil
a = 2.3
ceil = math.ceil(a)
print(ceil)

# 2: floor
floor = math.floor(a)
print(floor)

# 3: factorial
a = 5
factorial = math.factorial(a)
print(factorial)

# 4: Value
a = 2**3
print(a)

# 5: Squareroot
a = 16
sqrt = math.sqrt(a)
print(a)
```

```
3
2
120
8
16
```

E2: Numpy Array

```python
import math

import numpy as np

a = [20,23,82,40,32,15,67,52]

# Indicing
print("Before: " + str(a))

odd_i = []
even_i = []
for i in range(0, len(a)):
    if i % 2:
        even_i.append(a[i])
    else:
        odd_i.append(a[i])

a = odd_i + even_i

print("After: " + str(a))
```

```python
# Sorting
array = np.array(a)

print(np.sort(array))

# slicing 1
s1 = a[3:]

print(s1)

# slicing 2
s2 = a[0:5]

print(s2)

# negative slicing
negs = a[4:7]

print(negs)
```

```
Before: [20, 23, 82, 40, 32, 15, 67, 52]
After: [20, 82, 32, 67, 23, 40, 15, 52]
[15 20 23 32 40 52 67 82]
[67, 23, 40, 15, 52]
[20, 82, 32, 67, 23]
[23, 40, 15]
```

E3: Calculator

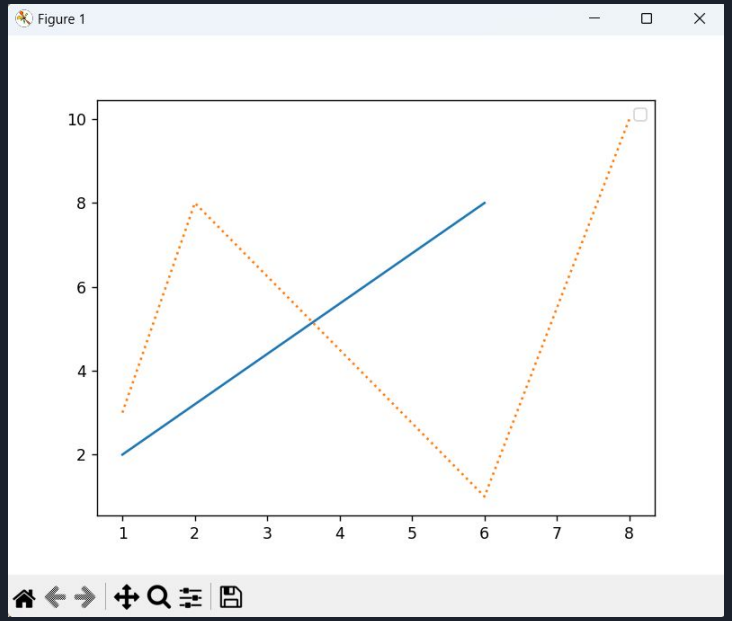
```
# Exercise 3: Calculator        You, last week • Updating

# Write a program that will display the calculator menu

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def add(a, b):
    return a + b

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def subtract(a, b):
    return a - b

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def multiply(a, b):
    return a * b

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def divide(a, b):
    return a / b

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def modulus(a, b):
    return a % b

Explain Code | Generate Tests | Generate Docstrings | Ask Sourcery
def greatest(a, b):
    if a>b:
        return a
    else:
        return b
```

```
print("Choose your operation")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
print("4. Divide")
print("5. Modulate")
print("6. Greater than")

while True:
    choice = input("Selecting choice(1/2/3/4/5/6): ")

    if choice in ('1','2','3','4','5','6'):
        try:
            a = float(input("Enter your first number: "))
            b = float(input("Enter your second number: "))
        except ValueError:
            print("Sorry, wrong input")
            continue

        if choice == '1':
            print(a, "+", b, "=", add(a, b))
        if choice == '2':
            print(a, "-", b, "=", subtract(a, b))
        if choice == '3':
            print(a, "*", b, "=", multiply(a, b))
        if choice == '4':
            print(a, "/", b, "=", divide(a, b))
        if choice == '5':
            print(a, "%", b, "=", modulus(a, b))
        if choice == '6':
            print("The greatest number is ",greatest(a, b))

        break
```

```
Choose your operation
1. Add
2. Subtract
3. Multiply
4. Divide
5. Modulate
6. Greater than
Selecting choice(1/2/3/4/5/6): 6
Enter your first number: 69
Enter your second number: 96
The greatest number is  96.0
```

E4: Line Graph

```
# Exercise 4: Line graph        You, last week • Updating Exercise 4.py

# Draw a line in a diagram from position (1, 2) to position (6, 8)
# Draw a dotted line in a diagram from position (1, 3) to (2, 8) then to (6, 1) and finally to position (8, 10)

import matplotlib.pyplot as plt

x = [1, 6]
y = [2, 8]

xdot = [1, 2, 6, 8]
ydot = [3, 8, 1, 10]

plt.plot(x, y)

plt.plot(xdot, ydot, linestyle='dotted')

plt.legend()

plt.show()
```



E5: Working with JSON File

```python
# Exercise 5: Working with JSON File       You, last week • JSON is weird?

# Create a JSON file named 'StudentJson.json' with the following details

import json

# 1. Ask the user to enter the student name, ID, and course and write these contents to the JSON file
# 2. Read the contents from the JSON file and display the individual values
# 3. Append another dictionary as follows as key value pair for student 1 in StudentDetails dictionary
# 4. Print the individual values of the Student details reading from JSON file

json_string = '''
    {
        "Details of the student are": [
            {
                "Name": "Alpha",
                "ID": "1",
                "Course": "BSc CC"
                },
                {
                    "Group": "A",
                    "Year": 2
                }
        ]
    }
'''

data = json.loads(json_string)
print(data)
```

```
{'Details of the student are': [{'Name': 'Alpha', 'ID': '1', 'Course': 'BSc CC'}, {'Group': 'A', 'Year': 2}]}
```

Bonuses

Bonus: Multiplication Table

```
# Bonus A: Multiplication Tables

# Write a program to print Multiplication tabl
# Hint: Use nested loops


# Multiplication table of 1
print ("Multiplication table of 1")
number = int(input("Enter an integer: "))

for count in range (1, 11):
    product = number * count
    print(number, "*", count, "=", product)

# Multiplication table of 10
print ("Multiplication table of 10")
number = int(input("Enter an integer: "))

for count in range (1, 11):
    product = number * count
    print(number, "*", count, "=", product)
```

```
Multiplication table of 1Multiplication table of 10
Enter an integer: 4      Enter an integer: 5
4 * 1 = 4                5 * 1 = 5
4 * 2 = 8                5 * 2 = 10
4 * 3 = 12               5 * 3 = 15
4 * 4 = 16               5 * 4 = 20
4 * 5 = 20               5 * 5 = 25
4 * 6 = 24               5 * 6 = 30
4 * 7 = 28               5 * 7 = 35
4 * 8 = 32               5 * 8 = 40
4 * 9 = 36               5 * 9 = 45
4 * 10 = 40              5 * 10 = 50
```

Bonus: Locations List

```python
# Exercise B: Locations List

# Using the list:
locations = ['Dubai','Paris', 'Switzerland', 'London', 'Amsterdam', 'New York']

# Note: I'm pretty sure you could've used 'Bern' instead of 'Switzerland'

# Print the list and find the length of the list

l = len(locations)      You, last week • Submitting my exercises so far

print ("The length of your tour lists is: ", l)

# Use sorted() to print your list in alphabetical order without modifying the actual list.

s = sorted(locations)

print (s)

# Show that your list is still in its original order by printing it.

print (locations)

# Use sorted() to print your list in reverse alphabetical order without changing the order of the original list

print(sorted(locations, reverse=True))

# Show that your list is still in its original order by printing it again.

print (locations)

# Use reverse() to change the order of your list.

locations.reverse()

# Use sorted() to print your list in reverse alphabetical order without changing the order of the original list

print(sorted(locations, reverse=True))
      You, last week • Submitting my exercises so far
# Show that your list is still in its original order by printing it again.

print (locations)

# Use reverse() to change the order of your list.

locations.reverse()

# Print the list to show that its order has changed.

print(locations)

# Use sort() to change your list so it's stored in alphabetical order.

locations.sort()

# Print the list to show that its order has been changed.

print(locations)

# Use sort() to change your list so it's stored in reverse alphabetical order.

locations.sort(reverse=True)

# Print the list to show that its order has changed.


print(locations)
```

```
The length of your tour lists is:  6
['Amsterdam', 'Dubai', 'London', 'New York', 'Paris', 'Switzerland']
['Dubai', 'Paris', 'Switzerland', 'London', 'Amsterdam', 'New York']
['Switzerland', 'Paris', 'New York', 'London', 'Dubai', 'Amsterdam']
['Dubai', 'Paris', 'Switzerland', 'London', 'Amsterdam', 'New York']
['New York', 'Amsterdam', 'London', 'Switzerland', 'Paris', 'Dubai']
['Amsterdam', 'Dubai', 'London', 'New York', 'Paris', 'Switzerland']
['Switzerland', 'Paris', 'New York', 'London', 'Dubai', 'Amsterdam']
```

Bonus: Locations List

```python
# Exercise C: Calculator Function       You, last week • Subm

# The program should display the following calculator menu:
# Add +, Subtract -, Multiply *, Divide /, Modulus %

# This adds two numbers

def add(a, b):
    return a + b

# This subtracts two numbers

def subtract(a, b):
    return a - b

# This multiplies two numbers

def multiply(a, b):
    return a * b

# This divides two numbers

def divide(a, b):
    return a / b

# This modulates two numbers

def modulus(a, b):
    return a % b
```

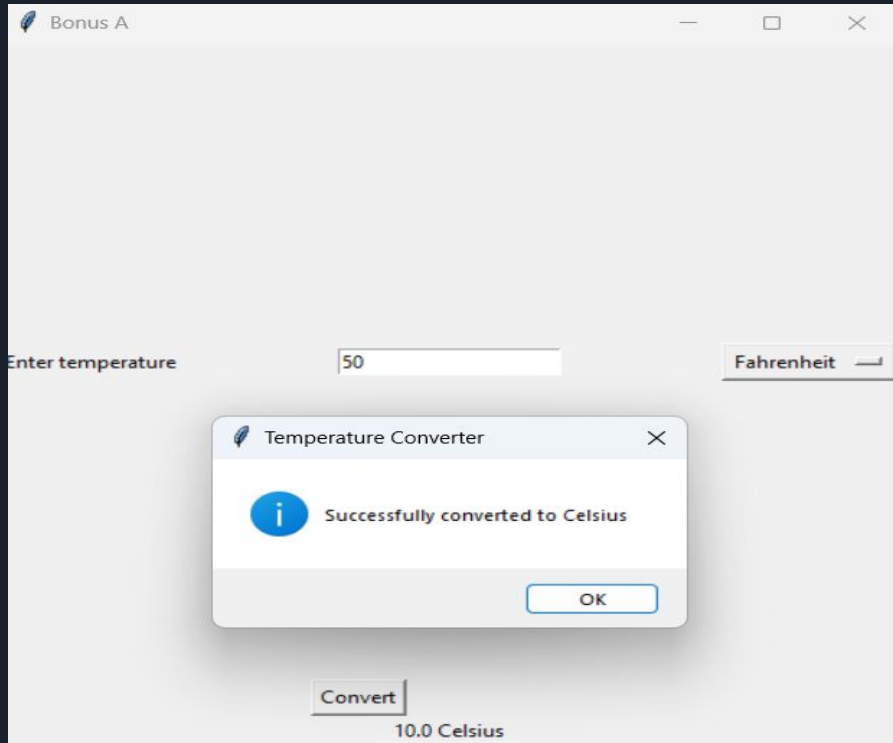
```python
print("Choose your operation")
print("1. Add")
print("2. Subtract")
print("3. Multiply")
print("4. Divide")
print("5. Modulate")

while True:
    choice = input("Selecting choice(1/2/3/4/5): ")

    if choice in ('1', '2', '3', '4', '5'):
        try:
            a = float(input("Enter your first number: "))
            b = float(input("Enter your second number: "))
        except ValueError:
            print("Sorry, wrong input")
            continue

        if choice == '1':
            print(a, "+", b, "=", add(a, b))
        if choice == '2':
            print(a, "-", b, "=", subtract(a, b))
        if choice == '3':
            print(a, "*", b, "=", multiply(a, b))
        if choice == '4':
            print(a, "/", b, "=", divide(a, b))
        if choice == '5':
            print(a, "%", b, "=", modulus(a, b))
        break
```

```
Choose your operation
1. Add
2. Subtract
3. Multiply
4. Divide
5. Modulate
Selecting choice(1/2/3/4/5): 5
Enter your first number: 50
Enter your second number: 75
50.0 % 75.0 = 50.0
```

Bonus: Temperature Converter

```python
import tkinter

from tkinter import *

from tkinter import messagebox

from functools import partial

temp_Val = "Celsius"

def store_temp(set_temp):
    global temp_Val
    temp_Val = set_temp

def call_convert(rlabel1,inputn):
    temp = inputn.get()

    if temp_Val == 'Celsius':

        f = float((float(temp) * 9 / 5) + 32)
        rlabel1.config(text ="%.1f Fahrenheit" % f)
        messagebox.showinfo("Temperature Converter",
                            "Successfully converted to Fahrenheit ", )

    if temp_Val == 'Fahrenheit':

        c = float((float(temp) - 32) * 5 / 9)
        rlabel1.config(text ="%.1f Celsius" % c)
        messagebox.showinfo("Temperature Converter",
                            "Successfully converted to Celsius ")
    return
```

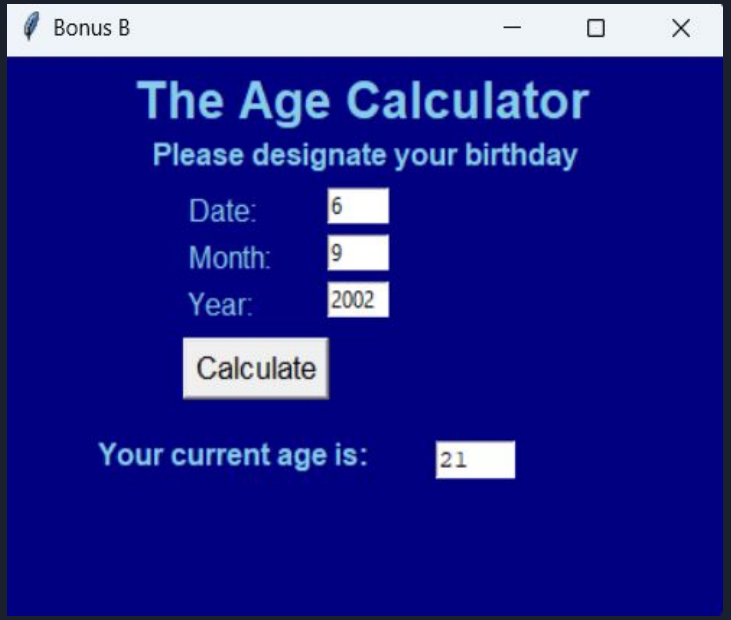
```python
main = Tk()

main.geometry('500x500')

main.title('Bonus A')

main.grid_columnconfigure(1, weight = 1)
main.grid_rowconfigure(1, weight = 1)        You, la

Ninput = StringVar()
var = StringVar()

Linput = Label(main,text="Enter temperature")
Einput = Entry(main,textvariable=Ninput)
Linput.grid(row=1)
Einput.grid(row=1,column=1)
Rabel = Label(main)
Rabel.grid(row=3,columnspan=4)

drowplist = ["Celsius", "Fahrenheit"]
drowp = OptionMenu(main,var,*drowplist,
                   command = store_temp)
var.set(drowplist[0])
drowp.grid(row = 1, column = 2)

call_convert = partial(call_convert, Rabel,
                       Ninput)
Besult = Button(main, text ="Convert",
                command = call_convert)
Besult.grid(row = 2, columnspan = 2)

main.mainloop()
```



Bonus: The Age Calculator

```
import tkinter
    You, last week • Updating Chapter 2's bonuses
from tkinter import *

from datetime import date

today = date.today()

def exit():
    main.destroy()

def get_age():
    d= int(e1.get())
    m=int(e2.get())
    y=int(e3.get())
    age =today.year-y-((today.month, today.day)<(m,d))
    t1.config(state='normal')
    t1.delete('1.0', END)
    t1.insert(END,age)
    t1.config(state='disabled')
```

```
main = Tk()
main.geometry("400x300")
main.config(bg="navyblue")
main.resizable(True,True)
main.title('Bonus B')

l1 = Label(main,text="The Age Calculator",font=('Helvetica',20,'bold'),fg="skyblue",bg="navyblue")
l2 = Label(main,font=('Helvetica',12,'bold'),text="Please designate your birthday",fg="skyblue",bg="navyblue")

day = Label(main,text="Date: ",font=('Helvetica',12),fg="skyblue",bg="navyblue")
month = Label(main,text="Month: ",font=('Helvetica',12),fg="skyblue",bg="navyblue")
year = Label(main,text="Year: ",font=('Helvetica',12),fg="skyblue",bg="navyblue")
e1 = Entry(main,width=5)
e2 = Entry(main,width=5)
e3 = Entry(main,width=5)

b1 = Button(main,text="Calculate",font=('Helvetica',13),command=get_age)

l3 = Label(main,text="Your current age is: ",font=('Helvetica',12,'bold'),fg="skyblue",bg="navyblue")
t1 = Text(main,width=5,height=0,state="disabled")

l1.place(x=70,y=5)
l2.place(x=80,y=40)
day.place(x=100,y=70)
month.place(x=100,y=95)
year.place(x=100,y=120)
e1.place(x=180,y=70)
e2.place(x=180,y=95)
e3.place(x=180,y=120)
b1.place(x=100,y=150)
l3.place(x=50,y=200)
t1.place(x=240,y=205)

main.mainloop()
```



END