**#Different libraries used to provide GUI**

from tkinter import \*

import time

import numpy as np

import matplotlib.pyplot as plt

**#Pseudo Window created to show pseudo code of bubble sort**

def bubble\_pseudo\_window():

root7=Tk()

root7.title("Pseudo Code")

root7.geometry("650x850+100+0")

def prev():

root7.destroy()

bubble()

**#Button created to invoke pseudo window**

button19=Button(root7,text="Previous Page",bg='#EBF5E6',command=prev)

button19.grid(row=1,sticky=E)

img2=PhotoImage(file="pic11.png")

label2=Label(root7,image=img2)

label2.grid(row=0)

root7.mainloop()

**#Simulation Window created to display simulation of bubble sort**

def bubble\_simuation\_window():

root8=Tk()

root8.title("Simulation Window")

root8.geometry("1080x850+100+0")

root8.configure(bg="white")

def prev11():

root8.destroy()

bubble()

**#Button created to invoke Simulation window**

button19=Button(root8,text="Previous Page",bg='#EBF5E6',command=prev11)

button19.grid(row=1,sticky=W)

i=0

while True:

if i==0:

img100=PhotoImage(file="pic39.png")

label2=Label(root8,image=img100,bg="white")

label2.grid(sticky=W,padx=200)

i+=1

root8.update()

time.sleep(3)

if i==1:

img101=PhotoImage(file="pic40.png")

label3=Label(root8,image=img101,bg="white")

label3.grid(sticky=W,padx=200)

i+=1

root8.update()

time.sleep(3)

if i==2:

img102=PhotoImage(file="pic41.png")

label4=Label(root8,image=img102,bg="white")

label4.grid(sticky=W,padx=200)

i+=1

root8.update()

time.sleep(3)

if i==3:

img103=PhotoImage(file="pic42.png")

label5=Label(root8,image=img103,bg="white")

label5.grid(sticky=W,padx=200,pady=5)

i+=1

root8.update()

time.sleep(3)

if i==4:

img104=PhotoImage(file="pic43.png")

label6=Label(root8,image=img104,bg="white")

label6.grid(sticky=W,padx=200,pady=5)

i+=1

root8.update()

time.sleep(3)

if i==5:

img105=PhotoImage(file="pic44.png")

label7=Label(root8,image=img105,bg="white")

label7.grid(sticky=W,padx=200,pady=5)

i+=1

root8.update()

time.sleep(3)

if i==6:

img106=PhotoImage(file="pic45.png")

label8=Label(root8,image=img106,bg="white")

label8.grid(sticky=W,padx=200,pady=5)

i+=1

root8.update()

time.sleep(3)

if i==7:

img107=PhotoImage(file="pic46.png")

label9=Label(root8,image=img107,bg="white")

label9.grid(sticky=W,padx=200,pady=5)

i+=1

root8.update()

time.sleep(3)

if i==8:

img108=PhotoImage(file="pic47.png")

label10=Label(root8,image=img108,bg="white")

label10.grid(sticky=W,padx=200,pady=5)

break

root8.mainloop()

**#Graph Window created to show complexity graph of bubble sort**

def Bubble\_graph\_window():

root9=Tk()

root9.title("complexity Graph")

root9.geometry("755x790+100+0")

root9.configure(bg="white")

x = np.linspace(0, 6, 100)

y\_1 = np.power(x, 2)

y\_2 = np.power(x, 2)

y\_3 = np.power(x, 1)

plt.plot(x, y\_1, label = "Average CAse")

plt.plot(x, y\_2+0.5, label = "Worst Case")

plt.plot(x, y\_3, label = "Best Case")

plt.title('Compexity of Bubble Sort')

plt.xlabel('Time')

plt.show()

def prev21():

root9.destroy()

bubble()

**#Button created to invoke Graph window**

button19=Button(root9,text="Previous Page",bg='#EBF5E6',command=prev21)

button19.grid(row=1,sticky=S)

root9.mainloop()

**#Pseudo Window created to display pseudo code of Insertion sort**

def insertion\_pseudo\_window():

root10=Tk()

root10.title("Pseudo Code")

root10.geometry("650x850+100+0")

def prev2():

root10.destroy()

insertion()

**#Button created to invoke Pseudo window**

button19=Button(root10,text="Previous Page",bg='#EBF5E6',command=prev2)

button19.grid(row=1,sticky=E)

img2=PhotoImage(file="pic12.png")

label2=Label(root10,image=img2)

label2.grid(row=0)

root10.mainloop()

**#Simulation Window** **created to show simulation of insertion sort**

def insertion\_simulation\_window():

root11=Tk()

root11.title("Simulation Window")

root11.geometry("1080x850+100+0")

root11.configure(bg="white")

def prev12():

root11.destroy()

insertion()

**#Button created to invoke simulation window**

button19=Button(root11,text="Previous Page",bg='#EBF5E6',command=prev12)

button19.grid(row=1,sticky=W)

i=0

while True:

if i==0:

img100=PhotoImage(file="pic30.png")

label2=Label(root11,image=img100,bg="white")

label2.grid(sticky=W,padx=200,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==1:

img101=PhotoImage(file="pic31.png")

label3=Label(root11,image=img101,bg="white")

label3.grid(sticky=W,padx=200,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==2:

img102=PhotoImage(file="pic32.png")

label4=Label(root11,image=img102,bg="white")

label4.grid(sticky=W,padx=200,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==3:

img103=PhotoImage(file="pic33.png")

label5=Label(root11,image=img103,bg="white")

label5.grid(sticky=W,padx=200,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==4:

img104=PhotoImage(file="pic34.png")

label6=Label(root11,image=img104,bg="white")

label6.grid(sticky=W,padx=202,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==5:

img105=PhotoImage(file="pic35.png")

label7=Label(root11,image=img105,bg="white")

label7.grid(sticky=W,padx=201,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==6:

img106=PhotoImage(file="pic36.png")

label8=Label(root11,image=img106,bg="white")

label8.grid(sticky=W,padx=200,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==7:

img107=PhotoImage(file="pic37.png")

label9=Label(root11,image=img107,bg="white")

label9.grid(sticky=W,padx=200,pady=10)

i+=1

root11.update()

time.sleep(3)

if i==8:

img108=PhotoImage(file="pic38.png")

label10=Label(root11,image=img108,bg="white")

label10.grid(sticky=W,padx=200,pady=10)

break

root11.mainloop()

**#Graph Window designed to show complexity graph of insertion sort**

def insertion\_graph\_window():

root12=Tk()

root12.title("complexity Graph")

root12.geometry("750x790+100+0")

root12.configure(bg="white")

x = np.linspace(0, 6, 100)

y\_1 = np.power(x,2)

plt.subplot(211)

plt.plot(x, y\_1)

plt.title('Compexity of Quick Sort')

plt.ylabel('Worst Case')

plt.xlabel('Time')

fig, ax = plt.subplots()

dt = 0.01

x = np.arange(dt, 20.0, dt)

ax.semilogx(x, np.exp(-x / 5.0))

plt.ylabel('Average Case')

plt.xlabel('Time')

plt.title('Compexity of Quick Sort')

fig, ax = plt.subplots()

dt = 0.01

x = np.arange(dt, 20.0, dt)

ax.semilogx(x, np.exp(-x / 5.0))

plt.ylabel('Best Case')

plt.xlabel('Time')

plt.title('Compexity of Quick Sort')

plt.show()

def prev22():

root12.destroy()

insertion()

**#Button created to invoke graph window**

button19=Button(root12,text="Previous Page",bg='#EBF5E6',command=prev22)

button19.grid(row=1,sticky=S)

root12.mainloop()

**#Pseudo Window created to show pseudo code of selection sort**

def selection\_pseudo\_window():

root13=Tk()

root13.title("Pseudo Code")

root13.geometry("650x850+100+0")

def prev3():

root13.destroy()

selection()

**#Button created to invoke pseudo window**

button19=Button(root13,text="Previous Page",bg='#EBF5E6',command=prev3)

button19.grid(row=1,sticky=E)

img2=PhotoImage(file="pic13.png")

label2=Label(root13,image=img2)

label2.grid(row=0)

root13.mainloop()

**#Simulation Window created to show simulation of selection sort**

def selection\_simulation\_window():

root14=Tk()

root14.title("Simulation Window")

root14.geometry("1080x850+100+0")

root14.configure(bg="white")

def prev13():

root14.destroy()

selection()

**#Button created to invoke Simulation window**

button19=Button(root14,text="Previous Page",bg='#EBF5E6',command=prev13)

button19.grid(row=1,sticky=W)

i=0

while True:

if i==0:

img100=PhotoImage(file="pic20.png")

label2=Label(root14,image=img100,bg="white")

label2.grid(sticky=W,padx=200)

i+=1

root14.update()

time.sleep(3)

if i==1:

img101=PhotoImage(file="pic21.png")

label3=Label(root14,image=img101,bg="white")

label3.grid(sticky=W,padx=193)

i+=1

root14.update()

time.sleep(3)

if i==2:

img102=PhotoImage(file="pic22.png")

label4=Label(root14,image=img102,bg="white")

label4.grid(sticky=W,padx=193)

i+=1

root14.update()

time.sleep(3)

if i==3:

img103=PhotoImage(file="pic23.png")

label5=Label(root14,image=img103,bg="white")

label5.grid(sticky=W,padx=196)

i+=1

root14.update()

time.sleep(3)

if i==4:

img104=PhotoImage(file="pic24.png")

label6=Label(root14,image=img104,bg="white")

label6.grid(sticky=W,padx=198)

i+=1

root14.update()

time.sleep(3)

if i==5:

img105=PhotoImage(file="pic25.png")

label7=Label(root14,image=img105,bg="white")

label7.grid(sticky=W,padx=199)

i+=1

root14.update()

time.sleep(3)

if i==6:

img106=PhotoImage(file="pic26.png")

label8=Label(root14,image=img106,bg="white")

label8.grid(sticky=W,padx=193)

i+=1

root14.update()

time.sleep(3)

if i==7:

img107=PhotoImage(file="pic27.png")

label9=Label(root14,image=img107,bg="white")

label9.grid(sticky=W,padx=183)

i+=1

root14.update()

time.sleep(3)

if i==8:

img108=PhotoImage(file="pic28.png")

label10=Label(root14,image=img108,bg="white")

label10.grid(sticky=W,padx=195)

break

root14.mainloop()

**#Graph Window created to show complexity graph of selection sort**

def selection\_graph\_window():

root15=Tk()

root15.title("complexity Graph")

root15.geometry("755x790+100+0")

root15.configure(bg="white")

x = np.linspace(0, 6, 100)

y\_1 = np.power(x, 2)

y\_2 = np.power(x, 2)

y\_3 = np.power(x, 2)

plt.plot(x, y\_1, label = "Average Case")

plt.plot(x, y\_2+0.5, label = "Worst Case")

plt.plot(x, y\_3+1, label = "Best Case")

plt.title('Compexity of Selection Sort')

plt.xlabel('Time')

plt.show()

def prev23():

root15.destroy()

selection()

**#Button created to invoke graph window**

button19=Button(root15,text="Previous Page",bg='#EBF5E6',command=prev23)

button19.grid(row=1,sticky=S)

root15.mainloop()

**#Pseudo Window created to show pseudo code of merge sort**

def merge\_pseudo\_window():

root16=Tk()

root16.title("Pseudo Code")

root16.geometry("650x850+100+0")

def prev4():

root16.destroy()

merge()

**#Button created to invoke pseudo window**

button19=Button(root16,text="Previous Page",bg='#EBF5E6',command=prev4)

button19.grid(row=1,sticky=E)

img2=PhotoImage(file="pic14.png")

label2=Label(root16,image=img2)

label2.grid(row=0)

root16.mainloop()

**#Simulation Window created to show simulation of merge sort**

def merge\_simulation\_window():

root17=Tk()

root17.title("Simulation Window")

root17.geometry("1210x850+100+0")

root17.configure(background="#1F333C")

def prev14():

root17.destroy()

merge()

**#Button created to invoke simulation window**

button19=Button(root17,text="Previous Page",bg='#EBF5E6',command=prev14)

button19.grid(row=6,column=0,sticky=W)

i=0

while True:

if i==0:

img100=PhotoImage(file="pic15.png")

label2=Label(root17,image=img100,bg="#1F333C")

label2.grid(pady=50,sticky=W)

i+=1

root17.update()

time.sleep(3)

if i==1:

img101=PhotoImage(file="pic16.png")

label3=Label(root17,image=img101,bg="#1F333C")

label3.grid(pady=25,sticky=W)

i+=1

root17.update()

time.sleep(3)

if i==2:

img102=PhotoImage(file="pic17.png")

label4=Label(root17,image=img102,bg="#1F333C")

label4.grid(pady=25,sticky=W)

i+=1

root17.update()

time.sleep(3)

if i==3:

img103=PhotoImage(file="pic18.png")

label5=Label(root17,image=img103,bg="#1F333C")

label5.grid(pady=25,sticky=W)

i+=1

root17.update()

time.sleep(3)

if i==4:

img104=PhotoImage(file="pic19.png")

label6=Label(root17,image=img104,bg="#1F333C")

label6.grid(sticky=W)

break

root17.mainloop()

**#Graph Window created to show complexity graph of merge sort**

def merge\_graph\_window():

root18=Tk()

root18.title("complexity Graph")

root18.geometry("755x730+100+0")

root18.configure(bg="white")

np.random.seed(19680801)

# make up some data in the interval ]0, 1[

y = np.random.normal(loc=0.5, scale=0.4, size=1000)

y = y[(y > 0) & (y < 1)]

y.sort()

x = np.arange(len(y))

plt.subplot(221)

plt.plot(x, y)

plt.yscale('log')

plt.ylabel("Worst Case")

plt.title('Time Complexity of Merge Sort')

plt.grid(True)

plt.subplot(222)

plt.plot(x, y, color = 'red')

plt.ylabel('Average Case')

plt.yscale('log')

plt.grid(True)

plt.subplot(223)

plt.plot(x, y, color = 'orange')

plt.ylabel('Best Case')

plt.yscale('log')

plt.grid(True)

plt.show()

def prev24():

root18.destroy()

merge()

**#Button created to invoke graph window**

button19=Button(root18,text="Previous Page",bg='#EBF5E6',command=prev24)

button19.grid(row=1,sticky=S)

root18.mainloop()

**#Overview Window displays overview of project**

def overview():

root1=Tk()

root1.title("Overview")

root1.geometry("1080x850+100+0")

def home6():

root1.destroy()

Home()

def insert6():

root1.destroy()

insertion()

def select6():

root1.destroy()

selection()

def bubb6():

root1.destroy()

bubble()

def merg6():

root1.destroy()

merge()

def sort6():

root1.destroy()

sorting()

frame1=Frame(root1)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6',command=home6)

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6')

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6',command=sort6)

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6',command=bubb6)

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6',command=insert6)

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6',command=select6)

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6',command=merg6)

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root1)

img3=PhotoImage(file="pic5.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW)

frame2.grid(row=0,column=1,sticky=N)

root1.mainloop()

**#Sorting Window designed which gives basic idea about data structures and sorting algorithms**

def sorting():

root2=Tk()

root2.title("Sorting Algorithms")

root2.geometry("1080x850+100+0")

def over5():

root2.destroy()

overview()

def insert5():

root2.destroy()

insertion()

def select5():

root2.destroy()

selection()

def bubb5():

root2.destroy()

bubble()

def merg5():

root2.destroy()

merge()

def home5():

root2.destroy()

Home()

frame1=Frame(root2)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6',command=home5)

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6',command=over5)

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6')

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6',command=bubb5)

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6',command=insert5)

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6',command=select5)

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6',command=merg5)

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root2)

img3=PhotoImage(file="pic6.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW)

frame2.grid(row=0,column=1,sticky=N)

root2.mainloop()

**#Bubble Window designed which explains about bubble sort**

def bubble():

root3=Tk()

root3.title("Bubble Sort")

root3.geometry("1080x850+100+0")

def g1():

root3.destroy()

Bubble\_graph\_window()

def s1():

root3.destroy()

bubble\_simuation\_window()

def e1():

root3.destroy()

bubble\_pseudo\_window()

def over4():

root3.destroy()

overview()

def insert4():

root3.destroy()

insertion()

def select4():

root3.destroy()

selection()

def home4():

root3.destroy()

Home()

def merg4():

root3.destroy()

merge()

def sort4():

root3.destroy()

sorting()

frame1=Frame(root3)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6',command=home4)

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6',command=over4)

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6',command=sort4)

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6')

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6',command=insert4)

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6',command=select4)

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6',command=merg4)

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root3)

img3=PhotoImage(file="pic7.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW,columnspan=3)

button7=Button(frame2,text="Pseudo Code",bg='#EBF5E6',command=e1)

button7.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button8=Button(frame2,text="Simulation",bg='#EBF5E6',command=s1)

button8.grid(row=2,column=1,padx=20,pady=10,ipadx=22,sticky=W)

button9=Button(frame2,text="Complexity Graph",bg='#EBF5E6',command=g1)

button9.grid(row=2,column=2,padx=20,pady=10,ipadx=22,sticky=W)

frame2.grid(row=0,column=1,sticky=N)

root3.mainloop()

**#Insertion Window designed which explains about insertion sort**

def insertion():

root4=Tk()

root4.title("Insertion Sort")

root4.geometry("1080x850+100+0")

def g2():

root4.destroy()

insertion\_graph\_window()

def s2():

root4.destroy()

insertion\_simulation\_window()

def e2():

root4.destroy()

insertion\_pseudo\_window()

def over3():

root4.destroy()

overview()

def home3():

root4.destroy()

insertion()

def select3():

root4.destroy()

selection()

def bubb3():

root4.destroy()

bubble()

def merg3():

root4.destroy()

merge()

def sort3():

root4.destroy()

sorting()

frame1=Frame(root4)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6',command=home3)

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6',command=over3)

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6',command=sort3)

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6',command=bubb3)

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6')

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6',command=select3)

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6',command=merg3)

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root4)

img3=PhotoImage(file="pic10.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW,columnspan=3)

button10=Button(frame2,text="Pseudo Code",bg='#EBF5E6',command=e2)

button10.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button11=Button(frame2,text="Simulation",bg='#EBF5E6',command=s2)

button11.grid(row=2,column=1,padx=20,pady=10,ipadx=22,sticky=W)

button12=Button(frame2,text="Complexity Graph",bg='#EBF5E6',command=g2)

button12.grid(row=2,column=2,padx=20,pady=10,ipadx=22,sticky=W)

frame2.grid(row=0,column=1,sticky=N)

root4.mainloop()

**#Selection Window designed which explains about selection sort**

def selection():

root5=Tk()

root5.title("Selection Sort")

root5.geometry("1080x850+100+0")

def g3():

root5.destroy()

selection\_graph\_window()

def s3():

root5.destroy()

selection\_simulation\_window()

def e3():

root5.destroy()

selection\_pseudo\_window()

def over2():

root5.destroy()

overview()

def insert2():

root5.destroy()

insertion()

def home2():

root5.destroy()

Home()

def bubb2():

root5.destroy()

bubble()

def merg2():

root5.destroy()

merge()

def sort2():

root5.destroy()

sorting()

frame1=Frame(root5)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6',command=home2)

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6',command=over2)

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6',command=sort2)

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6',command=bubb2)

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6',command=insert2)

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6')

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6',command=merg2)

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root5)

img3=PhotoImage(file="pic8.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW,columnspan=3)

frame2.grid(row=0,column=1,sticky=N)

button13=Button(frame2,text="Pseudo Code",bg='#EBF5E6',command=e3)

button13.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button14=Button(frame2,text="Simulation",bg='#EBF5E6',command=s3)

button14.grid(row=2,column=1,padx=20,pady=10,ipadx=22,sticky=W)

button15=Button(frame2,text="Complexity Graph",bg='#EBF5E6',command=g3)

button15.grid(row=2,column=2,padx=20,pady=10,ipadx=22,sticky=W)

root5.mainloop()

**#Merge Window designed which explains about merge sort**

def merge():

root6=Tk()

root6.title("Merge Sort")

root6.geometry("1080x850+100+0")

def g4():

root6.destroy()

merge\_graph\_window()

def s4():

root6.destroy()

merge\_simulation\_window()

def e4():

root6.destroy()

merge\_pseudo\_window()

def over1():

root6.destroy()

overview()

def insert1():

root6.destroy()

insertion()

def select1():

root6.destroy()

selection()

def bubb1():

root6.destroy()

bubble()

def home1():

root6.destroy()

Home()

def sort1():

root6.destroy()

sorting()

frame1=Frame(root6)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6',command=home1)

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6',command=over1)

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6',command=sort1)

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6',command=bubb1)

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6',command=insert1)

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6',command=select1)

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6')

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root6)

img3=PhotoImage(file="pic9.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW,columnspan=3)

frame2.grid(row=0,column=1,sticky=N)

button16=Button(frame2,text="Pseudo Code",bg='#EBF5E6',command=e4)

button16.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button17=Button(frame2,text="Simulation",bg='#EBF5E6',command=s4)

button17.grid(row=2,column=1,padx=20,pady=10,ipadx=22,sticky=W)

button18=Button(frame2,text="Complexity Graph",bg='#EBF5E6',command=g4)

button18.grid(row=2,column=2,padx=20,pady=10,ipadx=22,sticky=W)

root6.mainloop()

**#Home window designed which provides user interface**

def Home():

root=Tk()

root.title("Sorting")

root.geometry("1080x850+100+0")

def over():

root.destroy()

overview()

def insert():

root.destroy()

insertion()

def select():

root.destroy()

selection()

def bubb():

root.destroy()

bubble()

def merg():

root.destroy()

merge()

def sort():

root.destroy()

sorting()

frame1=Frame(root)

img0=PhotoImage(file="pic.png")

label=Label(frame1,image=img0)

label.grid(row=0)

img1=PhotoImage(file="pic1.png")

label1=Label(frame1,image=img1)

label1.grid(row=1)

img2=PhotoImage(file="pic2.png")

label2=Label(frame1,image=img2)

label2.grid(row=5)

button1=Button(frame1,text="SA-Home",bg='#EBF5E6')

button1.grid(row=2,padx=20,pady=10,ipadx=22,sticky=W)

button2=Button(frame1,text="SA-Overview",bg='#EBF5E6',command=over)

button2.grid(row=3,padx=20,pady=2,ipadx=14,sticky=W)

button1=Button(frame1,text="Sorting Algorithm",bg='#EBF5E6',command=sort)

button1.grid(row=4,padx=20,pady=10,sticky=W)

button3=Button(frame1,text="Bubble Sort",bg='#EBF5E6',command=bubb)

button3.grid(row=6,padx=20,pady=10,ipadx=20,sticky=W)

button4=Button(frame1,text="Insertion Sort",bg='#EBF5E6',command=insert)

button4.grid(row=7,padx=20,pady=2,ipadx=15,sticky=W)

button5=Button(frame1,text="Selection Sort",bg='#EBF5E6',command=select)

button5.grid(row=8,padx=20,pady=10,ipadx=14,sticky=W)

button6=Button(frame1,text="Merge Sort",bg='#EBF5E6',command=merg)

button6.grid(row=9,padx=20,pady=2,ipadx=22,sticky=W)

frame1.grid(row=0,column=0,sticky=N)

frame2=Frame(root)

img3=PhotoImage(file="pic3.png")

label3=Label(frame2,image=img3)

label3.grid(row=0,sticky=NW)

img4=PhotoImage(file="pic4.png")

label6=Label(frame2,image=img4)

label6.grid(row=1)

frame2.grid(row=0,column=1,sticky=N)

root.mainloop()

Home()