**Name:** Neel Ittyerah Oommen

**Reg.No.:** 20BCE2000

**Course:** CSE3501 (Information Security Analysis and Audit) (Lab)

**Lab Assignment – 3**

**Question:** Design a simple 3 stage authentication system

**Solution:**

**Code:**

**User Class:**

class user:

    def \_\_init\_\_(self, \_name, \_pin, \_image, \_password):

        self.user\_name = \_name

        self.user\_pin = \_pin

        self.user\_image = \_image

        self.user\_password = \_password

**Main Program:**

import tkinter as tk

from user import user

from PIL import ImageTk

window = tk.Tk()

username\_var = tk.StringVar()

pin\_var = tk.StringVar()

password\_var = tk.StringVar()

message\_var = tk.StringVar()

result\_var = tk.StringVar()

image\_num = -1

image\_choice = -1

users = []

#stored variables

user\_name = None

pin = None

password = None

#loading images

photo1 = ImageTk.PhotoImage(file="dog.jpg")

photo2 = ImageTk.PhotoImage(file="eagle.jpg")

photo3 = ImageTk.PhotoImage(file="gold.jpg")

photo4 = ImageTk.PhotoImage(file="lion.jpg")

photo5 = ImageTk.PhotoImage(file="parrot.jpg")

photo6 = ImageTk.PhotoImage(file="shark.jpg")

photo7 = ImageTk.PhotoImage(file="sheep.jpg")

photo8 = ImageTk.PhotoImage(file="tiger.jpg")

photo9 = ImageTk.PhotoImage(file="whale.jpg")

def search\_username(username):

    global users

    user\_found = -1

    for u in users:

        if u.user\_name == username:

            user\_found = u

            break

    return user\_found

def switch\_page(from\_page, to\_page):

    global page\_dict

    page\_dict[to\_page].pack(fill='both', expand=1)

    page\_dict[from\_page].forget()

def create\_login\_page(f):

    global username\_var

    global pin\_var

    global message\_var

    user\_name\_label = tk.Label(f, text="Enter User Name:").grid(row = 0, column = 0,padx = 10, pady = 10)

    user\_name\_entry = tk.Entry(f, textvariable = username\_var, font=('calibre', 10, 'normal')).grid(row  = 0, column = 1,padx = 10, pady = 10)

    pin\_label = tk.Label(f, text="Enter Pin:").grid(row = 1, column = 0,padx = 10, pady = 10)

    pin\_entry = tk.Entry(f, textvariable = pin\_var, show='\*' ,font=('calibre', 10, 'normal')).grid(row = 1, column = 1,padx = 10, pady = 10)

    message\_label = tk.Label(f, textvariable=message\_var).grid(row = 2, column = 1)

    login\_submit\_button = tk.Button(f, text='Submit', command=verify\_login). grid(row = 3, column = 1,padx = 10, pady = 10)

    reg\_button = tk.Button(f, text='Register New User', command=lambda: switch\_page(from\_page=2, to\_page=1)). grid(row = 4, column = 1,padx = 10, pady = 10)

def create\_image\_page(f):

    global image\_num

    button\_1 = tk.Button(f, image=photo1, command=lambda: check\_image(1)).grid(row = 0, column = 0, padx = 10, pady = 10)

    button\_2 = tk.Button(f, image=photo2, command=lambda: check\_image(2)).grid(row = 0, column = 1, padx = 10, pady = 10)

    button\_3 = tk.Button(f, image=photo3, command=lambda: check\_image(3)).grid(row = 0, column = 2, padx = 10, pady = 10)

    button\_4 = tk.Button(f, image=photo4, command=lambda: check\_image(4)).grid(row = 1, column = 0, padx = 10, pady = 10)

    button\_5 = tk.Button(f, image=photo5, command=lambda: check\_image(5)).grid(row = 1, column = 1, padx = 10, pady = 10)

    button\_6 = tk.Button(f, image=photo6, command=lambda: check\_image(6)).grid(row = 1, column = 2, padx = 10, pady = 10)

    button\_7 = tk.Button(f, image=photo7, command=lambda: check\_image(7)).grid(row = 2, column = 0, padx = 10, pady = 10)

    button\_8 = tk.Button(f, image=photo8, command=lambda: check\_image(8)).grid(row = 2, column = 1, padx = 10, pady = 10)

    button\_9 = tk.Button(f, image=photo9, command=lambda: check\_image(9)).grid(row = 2, column = 2, padx = 10, pady = 10)

def create\_password\_page(f):

    global password\_var

    password\_label = tk.Label(f, text="Enter your password: ").grid(row = 0, column = 0, padx = 10, pady = 10)

    password\_entry = tk.Entry(f, textvariable=password\_var, show='\*' ,font=('calibre', 10, 'normal')).grid(row = 0, column = 1, padx = 10, pady = 10)

    password\_button = tk.Button(f, text="Check Password", command=lambda: check\_password(password\_var)).grid(row = 1, column = 1, padx = 10, pady = 10)

    result\_label = tk.Label(f, textvariable=result\_var).grid(row = 2, column = 1, padx = 10, pady = 10)

def create\_reg\_page(f):

    name\_label = tk.Label(f, text="Enter New User Name:").grid(row = 0, column = 0, padx = 10, pady = 10)

    name\_var = tk.StringVar()

    name\_entry = tk.Entry(f, textvariable=name\_var).grid(row = 0, column = 1, padx = 10, pady = 10)

    pin\_label = tk.Label(f, text="Enter New Pin:").grid(row = 1, column = 0, padx = 10, pady = 10)

    pin\_var = tk.StringVar()

    pin\_entry = tk.Entry(f, textvariable=pin\_var).grid(row = 1, column = 1, padx = 10, pady = 10)

    button\_1 = tk.Button(f, image=photo1, command=lambda: choose\_image(1)).grid(row = 2, column = 0, padx = 10, pady = 10)

    button\_2 = tk.Button(f, image=photo2, command=lambda: choose\_image(2)).grid(row = 2, column = 1, padx = 10, pady = 10)

    button\_3 = tk.Button(f, image=photo3, command=lambda: choose\_image(3)).grid(row = 2, column = 2, padx = 10, pady = 10)

    button\_4 = tk.Button(f, image=photo4, command=lambda: choose\_image(4)).grid(row = 3, column = 0, padx = 10, pady = 10)

    button\_5 = tk.Button(f, image=photo5, command=lambda: choose\_image(5)).grid(row = 3, column = 1, padx = 10, pady = 10)

    button\_6 = tk.Button(f, image=photo6, command=lambda: choose\_image(6)).grid(row = 3, column = 2, padx = 10, pady = 10)

    button\_7 = tk.Button(f, image=photo7, command=lambda: choose\_image(7)).grid(row = 4, column = 0, padx = 10, pady = 10)

    button\_8 = tk.Button(f, image=photo8, command=lambda: choose\_image(8)).grid(row = 4, column = 1, padx = 10, pady = 10)

    button\_9 = tk.Button(f, image=photo9, command=lambda: choose\_image(9)).grid(row = 4, column = 2, padx = 10, pady = 10)

    password\_label = tk.Label(f, text="Enter New Password:").grid(row = 5, column = 0, padx = 10, pady = 10)

    password\_var = tk.StringVar()

    password\_entry = tk.Entry(f, textvariable=password\_var).grid(row = 5, column = 1, padx = 10, pady = 10)

    create\_user\_button = tk.Button(f, text="Create User", command=lambda: create\_new\_user(user\_name\_string=name\_var, user\_pin\_string=pin\_var, user\_image\_choice=image\_choice, user\_password\_string=password\_var)).grid(row = 6, column = 1, padx = 10, pady = 10)

    return\_to\_login = tk.Button(f, text="Go to Login Page", command=lambda: switch\_page(from\_page=1, to\_page=2)).grid(row=6,column=0,padx=10,pady=10)

def create\_new\_user(user\_name\_string, user\_pin\_string, user\_image\_choice, user\_password\_string):

    global users

    new\_user = user(\_name = user\_name\_string.get(), \_pin = user\_pin\_string.get(), \_image = user\_image\_choice,\_password = user\_password\_string.get())

    users.append(new\_user)

def choose\_image(num):

    global image\_choice

    image\_choice = num

def check\_password(password\_entry):

    u = search\_username(user\_name)

    if u.user\_password == password\_entry.get():

        result\_var.set("Login Successful!")

    else:

        result\_var.set("Login Failed")

def verify\_login():

    global username\_var

    global user\_name

    global pin\_var

    global pin

    global message\_var

    user\_name = username\_var.get()

    pin = pin\_var.get()

    check = len(pin)!=6 or not(pin.isnumeric())

    if check:

        label\_text = "PIN must be 6 characters long and must only contain numbers"

    else:

        res = search\_username(user\_name)

        if(res!=-1):

            if(res.user\_pin == pin):

                message\_var

                switch\_page(from\_page=2, to\_page=3)

        else:

            label\_text="User Not Found"

    message\_var.set(label\_text)

def check\_image(image\_num):

    global page\_dict

    u = search\_username(user\_name)

    if u.user\_image == image\_num:

        switch\_page(from\_page=3, to\_page=4)

window.title("Log-in-Page")

window.geometry("600x700")

reg\_page = tk.Frame(window)

login\_page = tk.Frame(window)

image\_page = tk.Frame(window)

password\_page = tk.Frame(window)

create\_login\_page(login\_page)

create\_image\_page(image\_page)

create\_password\_page(password\_page)

create\_reg\_page(reg\_page)

page\_dict = {1: reg\_page, 2:login\_page, 3:image\_page, 4:password\_page}

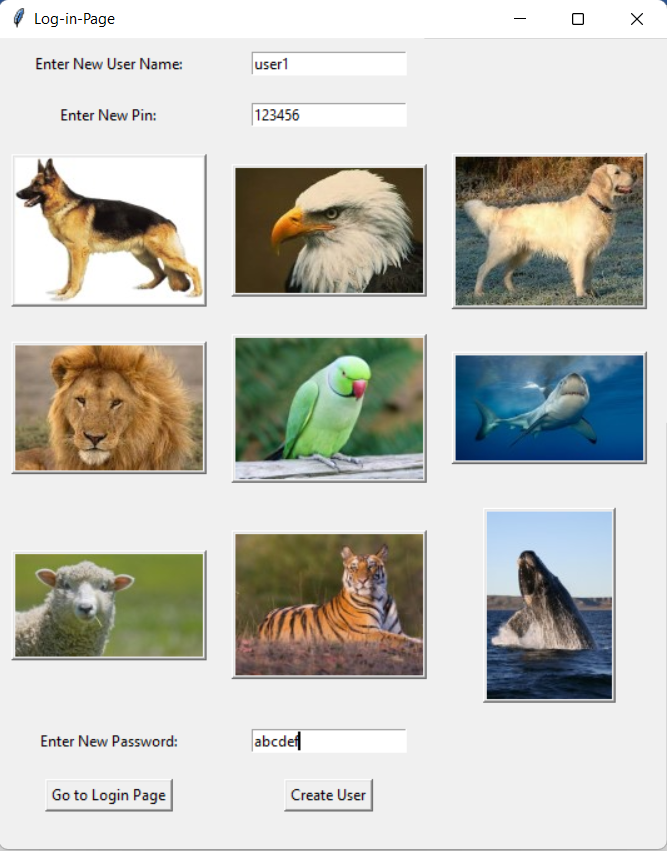
login\_page.pack(fill='both', expand = 1)

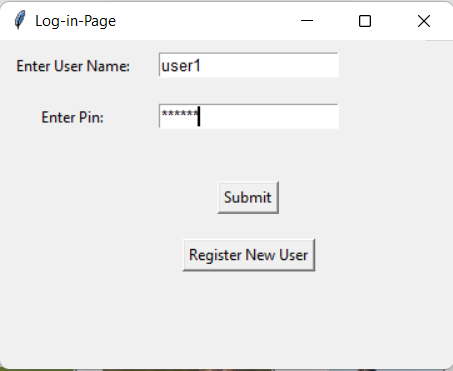
window.mainloop()

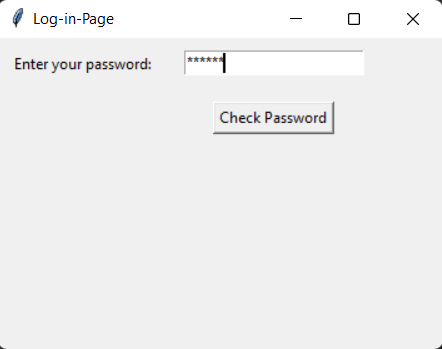
**Output:**

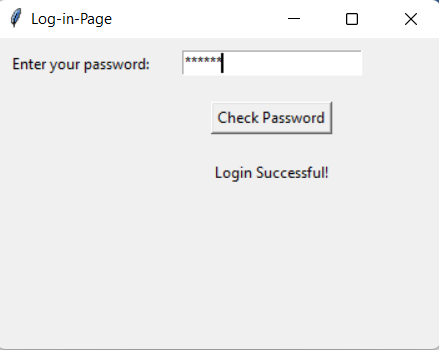
**Users created:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.no.** | **User Name** | **Pin** | **Image** | **Password** |
| 1 | user1 | 123456 | 1 | abcdef |
| 2 | user2 | 234567 | 2 | bcdefg |
| 3 | user3 | 345678 | 3 | cdefgh |
| 4 | user4 | 456789 | 4 | defghi |
| 5 | user5 | 567890 | 5 | efghij |
| 6 | user6 | 012345 | 6 | fghijk |
| 7 | user7 | 113425 | 7 | ghijkl |
| 8 | user8 | 673345 | 8 | hijklm |
| 9 | user9 | 091283 | 9 | ijklmn |
| 10 | user10 | 456234 | 2 | jklmno |

****

****

****

****

**Failed Login:**

