Aarohi ALPR System

Scope of Work

1. Login.py
    a. Takes the login credentials and Unique License Key
    b. On Successful login, following buttons are shown:
        i. Business Setup: to setup the business ID
        ii. Device ID: to setup various device details
        iii. Continue with Device ID: starts the ALPR logic
    c. On exit asks for confirmation
2. Lanch.py
    a. The ALPR logic
    b. Parses and processes through all the folders and files in the given input folder
    c. Moves processed files to processed folder, enters the output into the database
    d. Rename all the processed as Plate_Number.jpg
    e. Moves unprocessed files to unprocessed folder, enters the output into the database
    f. When no image is there to process it continuously pings all the device to checks for connectivity
    g. On exit asks for confirmation
3. Bussiness.py
    a. Takes Business ID, Country Code, Input folder, Unprocessed Folder, Processed Folder as input
    b. Saves all the values into the database
    c. On exit asks for confirmation
4. Device.py
    a. Takes Business ID, Device ID, Device IP as input
    b. Saves all the values into the database
    c. On exit asks for confirmation
5. DATABASE
    a. Business Table
    Sno. Business ID, Country Code, Input Folder, Processed Folder, Unprocessed Folder
    b. Device Table
    SNo, Business ID, Device ID, Device IP
    c. ALPR Table
    SNo, Business ID, Device ID, Processing Time, Plate Number, Accuracy
    d. Unprocessed Table
    SNo, Business ID, Device ID, InTime, Output

Dependencies

1. Python 3.6
2. OpenALPR
3. Python Tkinter
4. Subprocess
5. SQLite3
6. DateTime
7. Tesseract 4
8. OPENCV 4.0

Source Code

Login.py

```
#!/bin/usr/env python
from tkinter import *
import tkinter.filedialog as filedialog, tkinter.messagebox, os, subprocess as sub, sqlite3

master = Tk()
master.title('Launch Window')
master.geometry('350x300')
user = 'aarohi'
pas = 'aarohi'

def login():
	global master
	if not os.path.isfile('login.txt'):
		sub.call(['touch', 'login.txt'])
	f = open('login.txt', 'w')
	f.write(user)
	f.write(pas)
	f = open('login.txt', 'r')
	logi = f.read().rstrip('\n')
	vlogi = uid.get() + pswd.get()
	if str(logi) == str(vlogi):
		Button(master, text='Bussiness Setup', command=buss_fn).grid(row=5,
column=0, sticky=N, pady=4)
		Button(master, text='Device Setup', command=dev_fn).grid(row=5, column=1,
sticky=N, pady=4)
```

```
        Button(master, text='Continuing with APLR', command=alpr).grid(row=6,
column=0, sticky=N, pady=4)
        master.update()
    else:
        tkinter.messagebox.showerror('Please check the username and password!')
    f.close()

def exit():
    result = tkinter.messagebox.askquestion('Quit', 'Are You Sure?', icon='warning')
    if result == 'yes':
        master.quit()

def buss_fn():
    sub.call(['python3', 'bussiness.cpython-36.pyc'])

def dev_fn():
    sub.call(['python3', 'device.cpython-36.pyc'])
    result = tkinter.messagebox.askquestion('Device Setup', 'Do you want to enter more?',
icon='info')
    if result == 'yes':
        sub.call(['python3', 'device.cpython-36.pyc'])

def alpr():
    con=sqlite3.connect("Aarohi.db")
    cursor = con.cursor()
    cursor.execute("SELECT name FROM sqlite_master WHERE type='table' AND
name='Bussiness';")
    if len(cursor.fetchall())==0:
        tkinter.messagebox.showinfo('Please Create ateast one bussiness id ')
        sub.call(['python3', 'bussiness.cpython-36.pyc'])
        cursor.execute("SELECT name FROM sqlite_master WHERE type='table' AND
name='Device';")
        if len(cursor.fetchall())==0:
            tkinter.messagebox.showinfo('Please Create ateast one device id ')
            sub.call(['python3', 'device.cpython-36.pyc'])
    else:
        sub.call(['python3', 'launch.cpython-36.pyc'])

def main():
    global uid,pswd,lid
    Label(master, text=' Username *').grid(row=0, sticky=N, pady=4)
    Label(master, text=' Password *').grid(row=1, sticky=N, pady=4)
    Label(master, text=' License ID *').grid(row=2, sticky=N, pady=4)
    uid = Entry(master)
    pswd = Entry(master, show=”*”)
    lid = Entry(master)
    uid.grid(row=0, column=1, sticky=N, pady=4)
    pswd.grid(row=1, column=1, sticky=N, pady=4)
    lid.grid(row=2, column=1, sticky=N, pady=4)

    Button(master, text='login', command=login).grid(row=4, column=0, sticky=N, pady=4)
    Button(master, text='Exit', command=exit).grid(row=4, column=1, sticky=N, pady=4)

if __name__=="__main__":
    main()
    mainloop()
```

Launch.py

```
#!/bin/usr/env python3
from tkinter import *
import tkinter.filedialog as filedialog, os, subprocess as sub, sqlite3, locale, shutil,time
from datetime import datetime
locale.setlocale(locale.LC_ALL, 'C')

def folder_move(buss,dev):
        c=sqlite3.connect("Aarohi.db")
        cu = c.cursor()
        cu.execute("SELECT ccode FROM Bussiness WHERE bid=?", (buss,))
        c_code=str(cu.fetchall()[0][0]).rstrip('\n')
        cu.execute("SELECT infol FROM Bussiness WHERE bid=?", (buss,))
        input_folder=str(cu.fetchall()[0][0]).rstrip('\n')+"/"+dev+"/"
        cu.execute("SELECT pfol FROM Bussiness WHERE bid=?", (buss,))
        processed_folder=str(cu.fetchall()[0][0]).rstrip('\n')+"/"
        cu.execute("SELECT unfol FROM Bussiness WHERE bid=?", (buss,))
        unprocessed_folder=str(cu.fetchall()[0][0]).rstrip('\n')+"/"
        cu.execute("SELECT Dip FROM Device WHERE Did=?", (dev,))
        cip=str(cu.fetchall()[0][0]).rstrip('\n')
        pwd = os.path.dirname(os.path.realpath(__file__)).rstrip('\n')
        onlyfiles = [ f for f in os.listdir(input_folder) if
os.path.isfile(os.path.join(input_folder, f)) ]
        if len(onlyfiles)==0:
            time.sleep(10)
            response = os.system("ping -c 1 " + cip)
            if response >5:
                print("No files to process")
                time.sleep(1)
                tkinter.messagebox.showerror('Camera is not replying!')
        i = 0
        while i < len(onlyfiles):
            os.chdir(input_folder)
            intime=time.ctime(os.path.getctime(onlyfiles[i]))
            p1 = sub.Popen(['alpr', '-c',c_code,'--clock', onlyfiles[i]], stdout=sub.PIPE)
            output = p1.communicate()[0]
            old_nm=input_folder+str(onlyfiles[i])
            output=str(output.decode('utf-8'))
            output=output.split()
            a=0
            while a< len(output):
                if output[a] == "license":
                    print("file not processed")
                    c.execute("insert into unprocessed values (?,?,?,?,?) ",
(buss, dev, onlyfiles[i], intime, str(output)))
                    c.commit()
                    shutil.move(old_nm,unprocessed_folder)
                elif output[a] == "results":
                    print(buss, dev, output[15], output[17])
                    c.execute("insert into alpr values (?,?,?,?,?,?) ", (buss, dev,
intime, str(output[5]), str(output[15]), str(output[17])))
                    c.commit()
                    new_nm=processed_folder+(str(output[15])+".jpg")
                    shutil.move(old_nm,new_nm)
                a=a+1
            os.chdir(pwd)
            i += 1

if __name__=="__main__":
    buss="rohit"
    c=sqlite3.connect("Aarohi.db")
    cu = c.cursor()
    cu.execute("SELECT bid FROM Bussiness WHERE bid=?", (buss,))
    bid=str(cu.fetchall()[0][0]).rstrip('\n')
    cu.execute("SELECT Did FROM device WHERE bid=?", (buss,))
    d=cu.fetchall()
    c.execute('''CREATE TABLE if not exists alpr
            (Bid text(15), Did text(15), In_time blob, processing_time blob, Plate_no
text(20), Confidence float(4))''')
```

```
    c.execute('''CREATE TABLE if not exists unprocessed
            (Bid text(15), Did text(15), file_name blob, In_time blob, reason
text(100))''')
    c.commit()
    while(1):
        for k in d:
            for a in k:
                did=str(a)
                folder_move(bid,did)
```

Bussiness.py

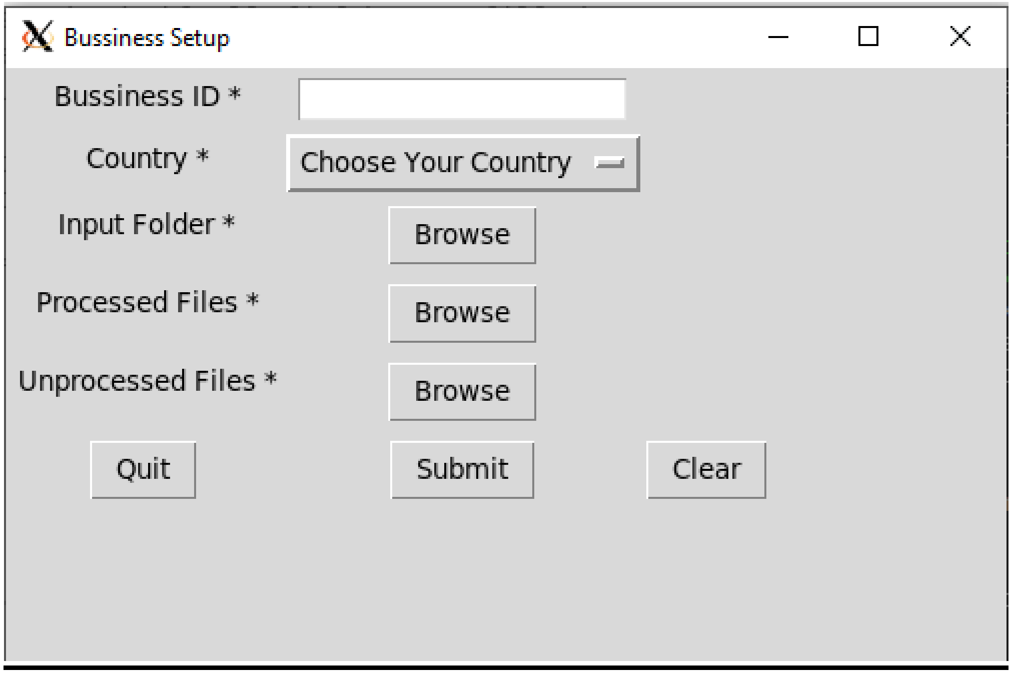
```
#!bin/usr/env python3
from tkinter import *
import tkinter.filedialog as filedialog, tkinter.messagebox,subprocess as sub, sqlite3, socket

master = Tk()
master.title('Bussiness Setup')
master.geometry('500x300')

input_path = StringVar()
processed_path = StringVar()
unprocessed_path = StringVar()
tkvar = StringVar()
OPTIONS = [
 'Choose Your Country',
 'Australia',
 'Argentina',
 'Brazil',
 'China',
 'Canada',
 'Europe',
 'Great Britain',
 'Indonesia',
 'India',
 'Japan',
 'Mexico',
 'New Zealand',
 'South Africa',
 'South Arabia',
 'South Korea',
 'UAE',
 'USA',
 'Thailand']

def input_folder():
    global inp,input_path
    inp = filedialog.askdirectory()
    input_path.set(inp)

def processed_folder():
    global pro,processed_path
    pro = filedialog.askdirectory()
    processed_path.set(pro)

def unprocessed_folder():
    global unpro,unprocessed_path
    unpro = filedialog.askdirectory()
    unprocessed_path.set(unpro)

def insert_entry_fields():
    buss = bid.get()
    tkvar.trace('w', country_code())
    if len(buss) == 0:
        tkinter.messagebox.showwarning('Warning', 'Bussiness ID not Eneterd')
    elif c_code == OPTIONS[0]:
        tkinter.messagebox.showwarning('Warning', 'Country Code not Eneterd')
    elif len(inp) == 0:
        tkinter.messagebox.showwarning('Warning', 'Input Folder Path not selected')
    elif len(pro) == 0:
        tkinter.messagebox.showwarning('Warning', 'Processed Folder Path not selected')
    elif len(unpro) == 0:
        tkinter.messagebox.showwarning('Warning', 'Unprocessed Folder Path not selected')
    else:
        c=sqlite3.connect("Aarohi.db")
        c.execute('''CREATE TABLE if not exists Bussiness
            (Bid text(15), ccode text(2), infol blob, pfol blob, unfol blob, primary key(Bid))''')
        c.execute("insert into Bussiness values (?, ?, ?, ?, ?)",( buss, c_code, inp, pro, unpro))
        c.commit()
        c.close()
    window_quit(0)
```

```
def country_code():
    global c_code
    if tkvar.get() == 'USA':
        c_code = 'us'
    elif tkvar.get() == 'Europe':
        c_code = 'eu'
    elif tkvar.get() == 'Thailand':
        c_code = 'thi'
    elif tkvar.get() == 'India':
        c_code = 'in'
    elif tkvar.get() == 'China':
        c_code = 'cn'
    elif tkvar.get() == 'Australia':
        c_code = 'au'
    elif tkvar.get() == 'Brazil':
        c_code = 'br'
    elif tkvar.get() == 'South Korea':
        c_code = 'kr'
    elif tkvar.get() == 'Mexico':
        c_code = 'mx'

def window_quit(x=1):
    global master
    if x == 0:
        result = tkinter.messagebox.askquestion('Submit', 'Are You Sure?',
icon='warning')
    else:
        result = tkinter.messagebox.askquestion('Quit', 'Are You Sure?', icon='warning')
    if result == 'yes':
        master.quit()

def clear():
    bid.delete(0, END)
    input_path.set('')
    processed_path.set('')
    unprocessed_path.set('')
    tkvar.set(OPTIONS[0])

def main_l():
    global bid
    Label(master, text=' Bussiness ID *').grid(row=0, sticky=N, pady=4)
    Label(master, text=' Country *').grid(row=1, sticky=N, pady=4)
    Label(master, text=' Input Folder *').grid(row=2, sticky=N, pady=4)
    Label(master, text=' Processed Files *').grid(row=3, sticky=N, pady=4)
    Label(master, text=' Unprocessed Files *').grid(row=4, sticky=N, pady=4)

    infol = Label(master, textvariable=input_path).grid(row=2, column=2, sticky=N, pady=4)
    profol = Label(master, textvariable=processed_path).grid(row=3, column=2, sticky=N, pady=4)
    unprofol = Label(master, textvariable=unprocessed_path).grid(row=4, column=2, sticky=N, pady=4)

    bid = Entry(master)
    bid.grid(row=0, column=1, sticky=N, pady=4)
    bid.insert(0, ")
    inp = "
    pro = "
    unpro = "
    tkvar.set(OPTIONS[0])

    Button(master, text='Browse', command=input_folder).grid(row=2, column=1, sticky=N, pady=4)
    Button(master, text='Browse', command=processed_folder).grid(row=3, column=1, sticky=N, pady=4)
    Button(master, text='Browse', command=unprocessed_folder).grid(row=4, column=1, sticky=N, pady=4)
    Button(master, text='Quit', command=window_quit).grid(row=5, column=0, sticky=N, pady=4)
    Button(master, text='Submit', command=insert_entry_fields).grid(row=5, column=1, sticky=N, pady=4)
    Button(master, text='Clear', command=clear).grid(row=5, column=2, sticky=N, pady=4)

    mainframe = Frame(master)
    mainframe.grid(column=1, row=1, sticky=N)
    mainframe.columnconfigure(0, weight=1)
    mainframe.rowconfigure(0, weight=1)
    popupMenu = OptionMenu(mainframe, tkvar, *OPTIONS)
    popupMenu.grid(row=2, column=2)

    mainframe = Frame(master)
    mainframe.grid(column=1, row=1, sticky=N)
    mainframe.columnconfigure(0, weight=1)
    mainframe.rowconfigure(0, weight=1)

if __name__=="__main__":
    main_l()
    mainloop()
```

Device.py

```
from tkinter import *
import tkinter.filedialog as filedialog, tkinter.messagebox,subprocess as sub, sqlite3, socket, os

root=Tk()
root.title('Device ID')
root.geometry('400x150')

def main_l():
    global bid, did, dip
    Label(root, text=' Bussiness ID *').grid(row=0,column=0, sticky=N, pady=4)
    Label(root, text=' Device ID *').grid(row=1,column=0, sticky=N, pady=4)
    Label(root, text=' Device IP *').grid(row=2,column=0, sticky=N, pady=4)

    bid = Entry(root)
    did = Entry(root)
    dip = Entry(root)

    bid.grid(row=0, column=1, sticky=N, pady=4)
    did.grid(row=1, column=1, sticky=N, pady=4)
    dip.grid(row=2, column=1, sticky=N, pady=4)

    dip.insert(0, socket.gethostbyname(socket.gethostname()))

    Button(root, text='Submit', command=devpro).grid(row=3, column=0, sticky=N, pady=4)
    Button(root, text='Cancel..', command=quit).grid(row=3, column=1, sticky=N, pady=4)
    Button(root, text='clear', command=clear).grid(row=3, column=2, sticky=N, pady=4)

def devpro():
    buss=bid.get()
    dev=did.get()
    cip=dip.get()

    if len(buss) == 0:
        tkinter.messagebox.showwarning('Warning', 'Device ID not Eneterd')
    elif len(dev) == 0:
        tkinter.messagebox.showwarning('Warning', 'Device ID not Eneterd')
    elif len(cip) == 0:
        tkinter.messagebox.showwarning('Warning', 'Device IP not Eneterd')
    else:
        c=sqlite3.connect("Aarohi.db")
        cu = c.cursor()
        cu.execute("SELECT bid FROM Bussiness WHERE bid=?", (buss,))
        if len(cu.fetchall()) !=0:
            c.execute('''CREATE TABLE if not exists Device
            (Bid text(15), Did text(15), Dip blob)''')
            c.execute("insert into Device values (?, ?, ?)",( buss,dev,cip))
            cu.execute("SELECT infol FROM Bussiness WHERE bid=?", (buss,))
            input_folder=str(cu.fetchall()[0][0]).rstrip('\n')+"/"
            path=input_folder+dev
            c.commit()
            c.close()
            try:
                os.makedirs(path)
            except FileExistsError:
                pass
            quit(0)
        else:
            tkinter.messagebox.showerror('Error', 'Bussiness ID doesnot Exists')


def clear():
    bid.delete(0, END)
    did.delete(0, END)
    dip.delete(0, END)

def quit(x=1):
    global root
    if x == 0:
        result = tkinter.messagebox.askquestion('Submit', 'Are You Sure?',
icon='warning')
    else:
        result = tkinter.messagebox.askquestion('Quit', 'Are You Sure?', icon='warning')
    if result == 'yes':
        root.quit()

if __name__=="__main__":
    main_l()
    mainloop()
```

OUTPUT



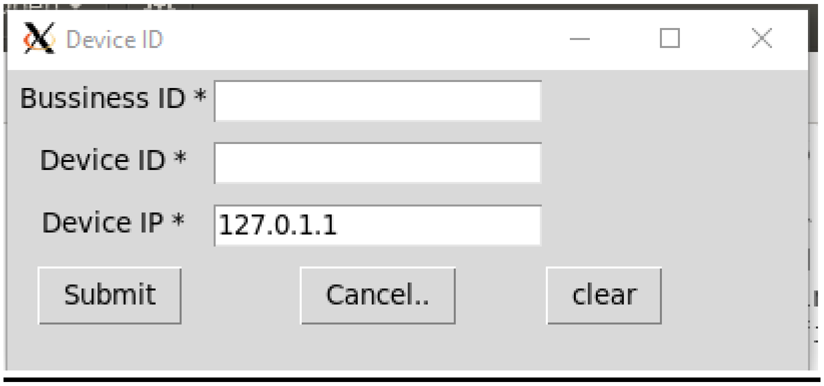
Bussiness ID *

Country * Choose Your Country

Input Folder *

Processed Files *

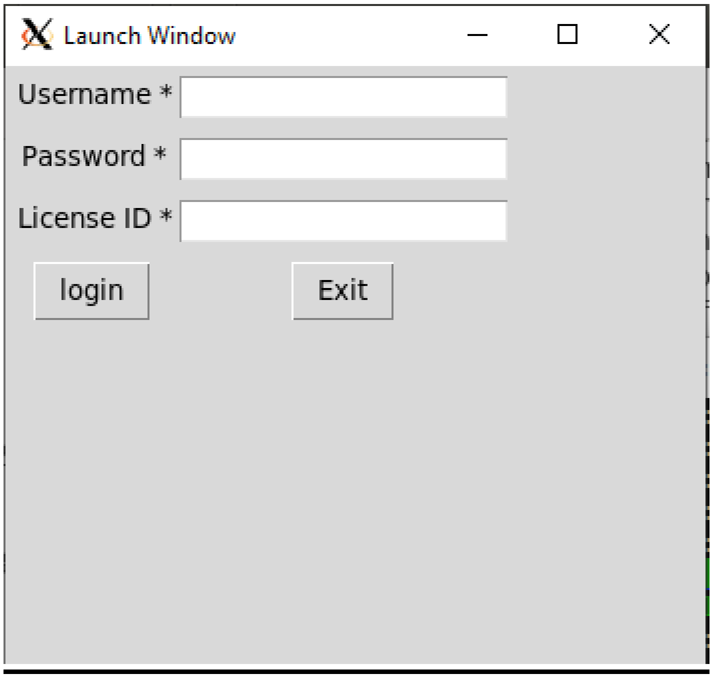
Unprocessed Files *

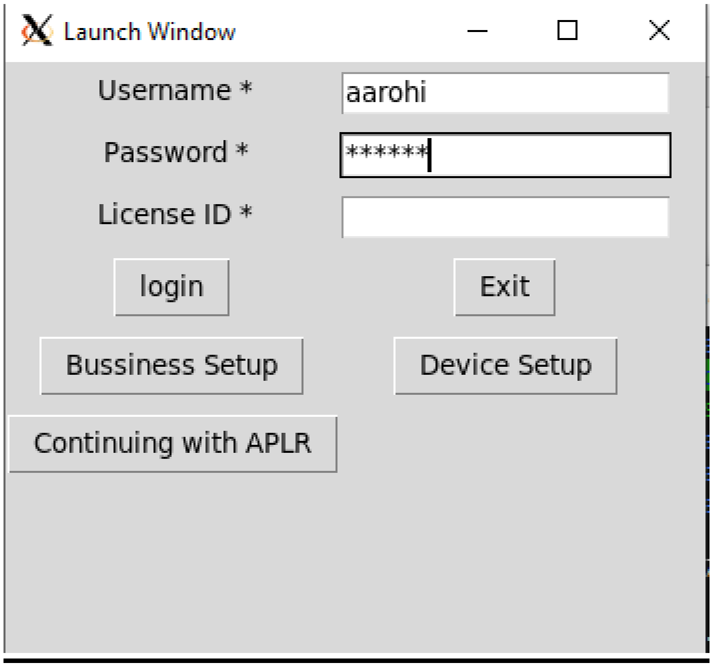


Bussiness ID *

Device ID *

Device IP * 127.0.1.1





Username * aarohi

Password * ******