DETECTION OF HELMET VIOLATION AND RECOGNITION OF THE LICENSE PLATE USING DEEP LEARNING ALGORITHM

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FINAL YEAR CSE
KINGS COLLEGE OF

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29.04.2023

ABSTRACT

The continuous mobilization of vehicles has led to a surge in the number of road accidents across the world. To get better at this, the government is trying to focus on the safest and most preventive measures in traffic. The practice of direct observation is found to be time taking and a lot of human effort is needed. So, our main idea is to introduce a helmet and number plate detection mechanism. This project attempts to implement a detection process through a few machine-learning algorithms by using predefined libraries. This system notices a person with/without a helmet thereby imposing fines on the detected candidate's license plate. Further, this research work concludes that the automatic identification of helmets can overcome the challenges faced by the manual data collection process. Moreover, this project work assumed that, through data collection, the algorithm can help to track helmet use and promote its active use by people to ensure road safety.

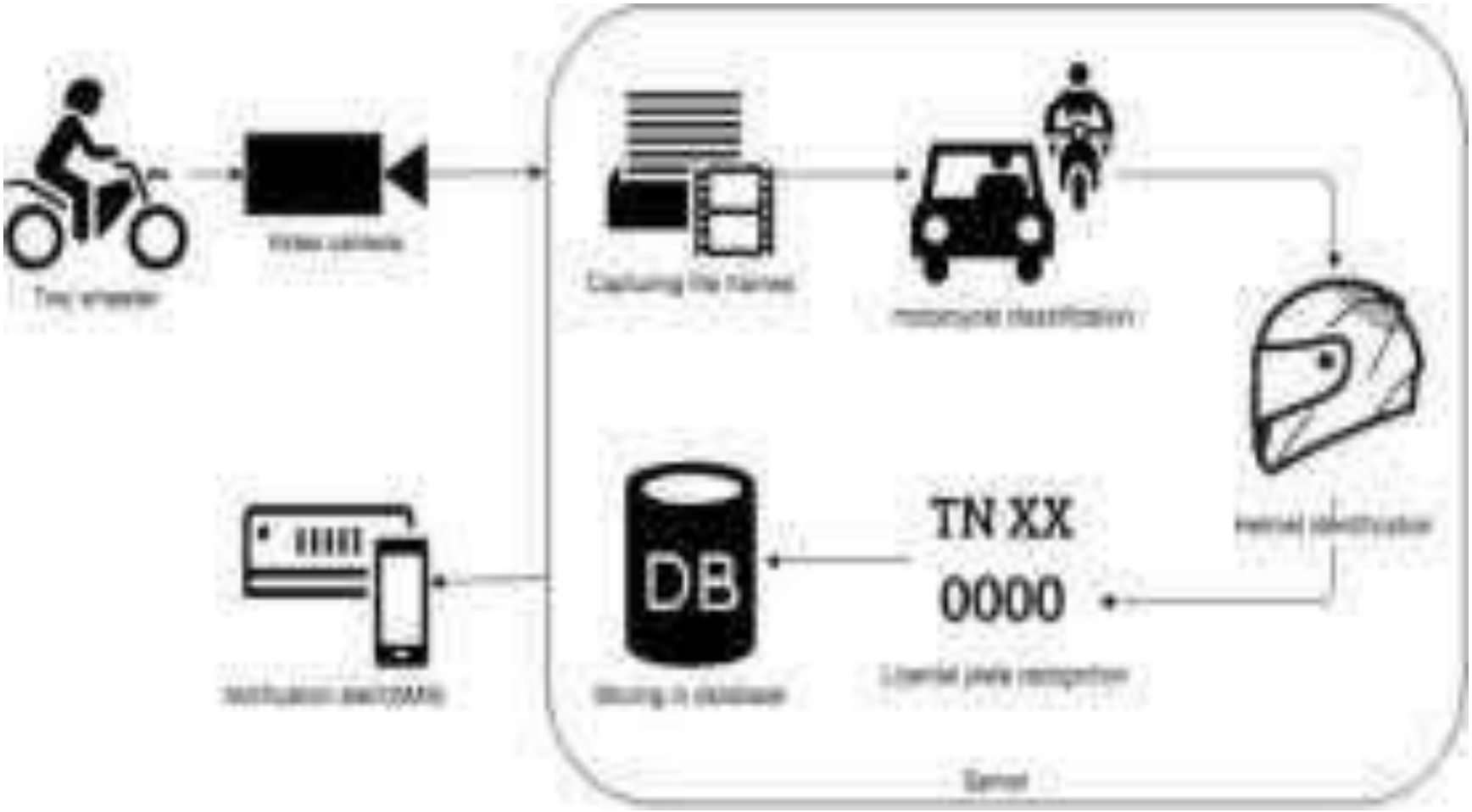
INTRODUCTION

- Two-wheeler Accidents have been rapidly growing throughout the years in many countries. The helmet is the main safety equipment of motorcyclists.
- The main goal of helmet is to protect the drivers head in case of an accident.
- In such a case, if the motorcyclist does not use a helmet, it can be fatal.
- It is not possible for traffic police force to watch every motorcycle and detect the person who is not wearing a helmet.
- To avoid these actions, there is need for a system that automatically detects the people who are not wearing a helmet and a system that detects number plates of the motorcycles and extracts the vehicle number which would help find the motorcyclist to be penalize.
- By using this method , the rate of accidents will reduce and many lives will be saved.

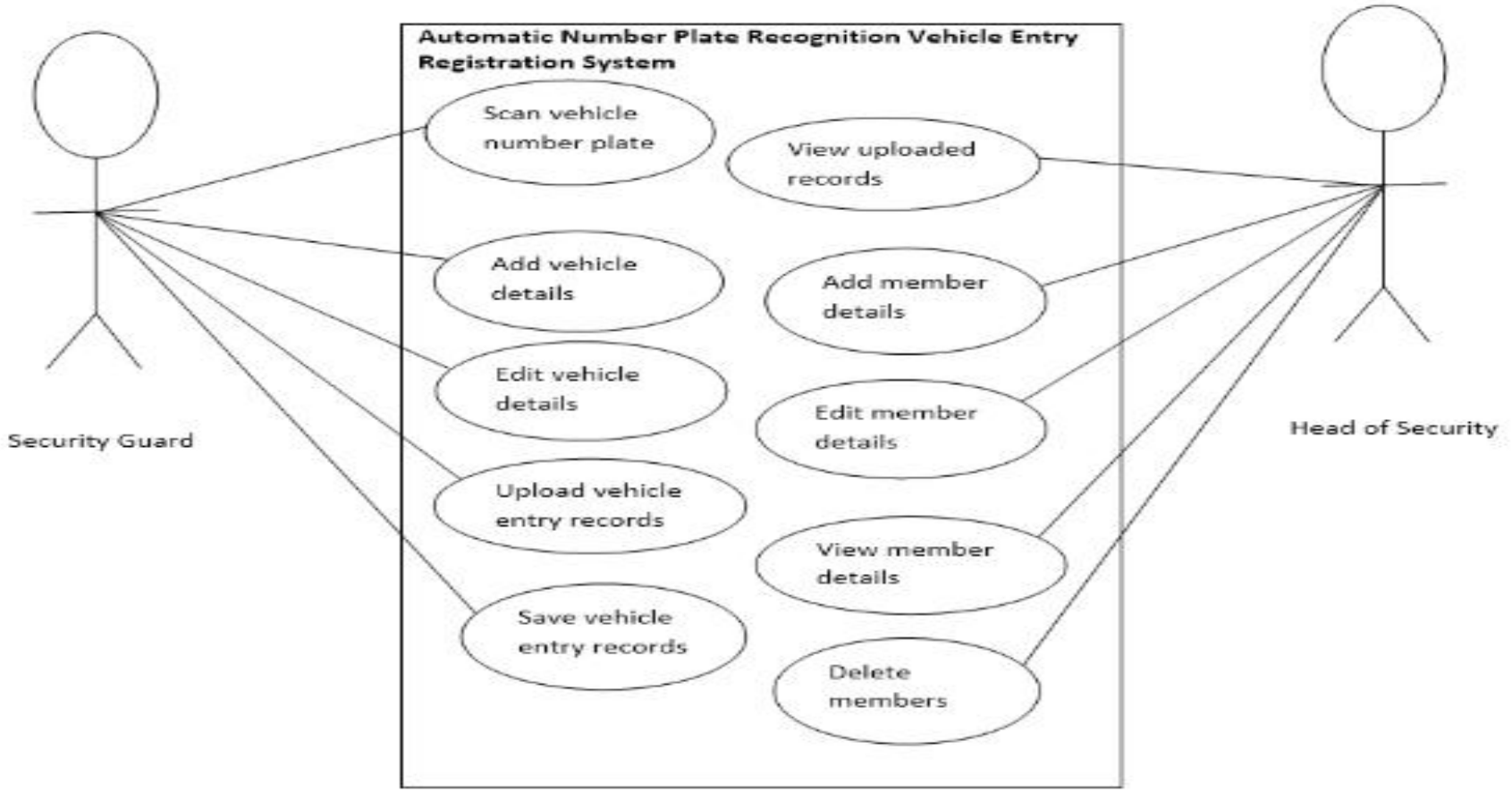
OBJECTIVE

- Develop a deep learning model to detect number plate and helmet violations in traffic.
- The model should be able to accurately detect number plate and helmet violations from images in real-time.
- The model should be able to detect both partial and full violations, and should also be able to accurately distinguish between motorcyclist with helmet and without helmet

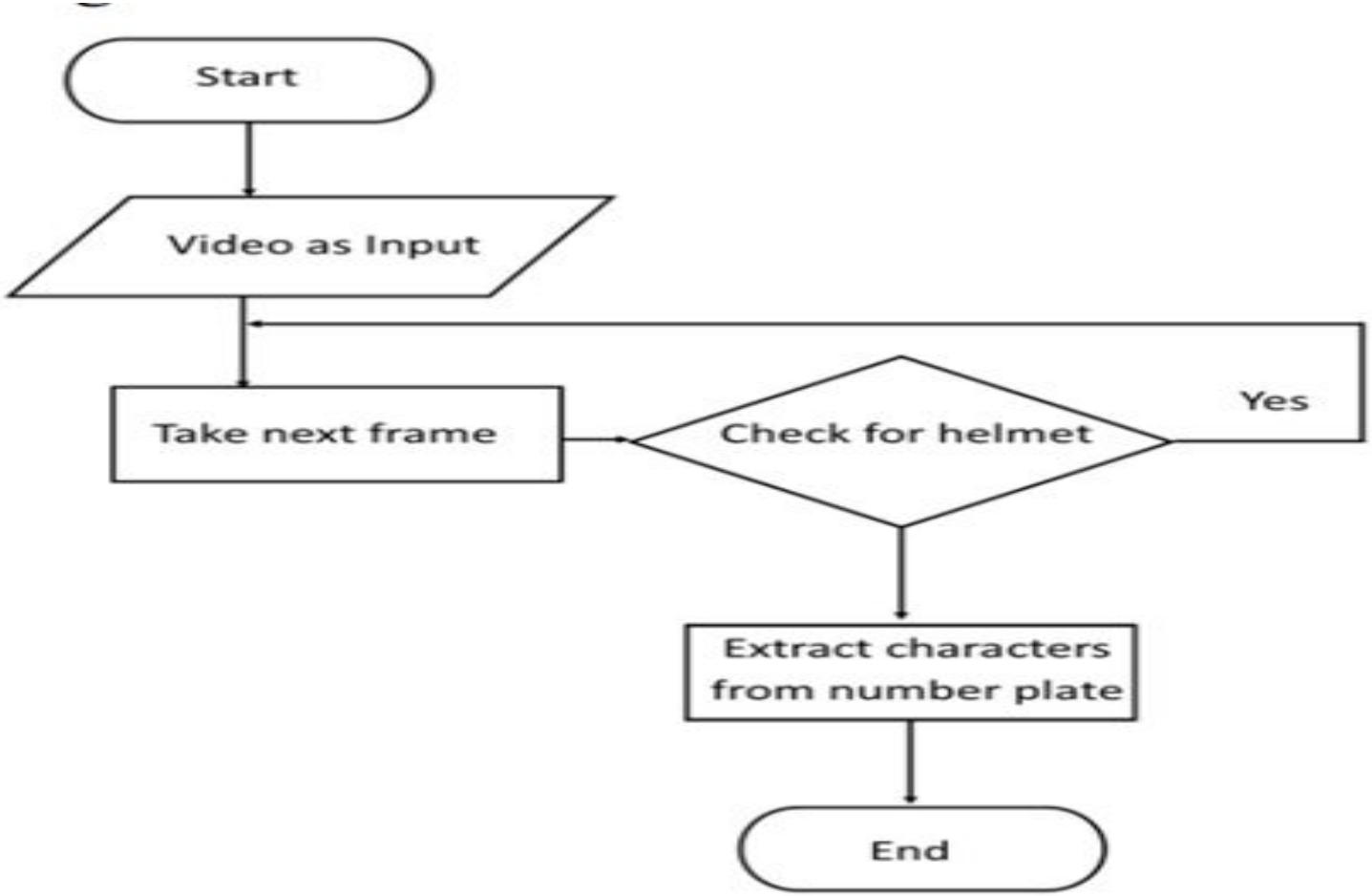
ARCHITECTURE DIAGRAM



USE CASE DIAGRAM



FLOW CHART


Start
Video as Input
Take next frame
Check for helmet
Yes
Extract characters from number plate
End

MODULES

- Framework construction
- Camera capturing
- Helmet classification
- Number plate recognition
- Alert system

MODULES

Framework construction

- In this module, admin can create the GUI for store the user details
- User details contains the information such as Vehicle number, mobile number and so on.
- These details are trained as RTO database

Helmet classification:

- In this module implement object detection system using YOLO algorithm
- Then detect the objects and draw bounding box on that objects
- Verify the features which are contains the helmet objects
- If helmet object not occurred means, forward to next module

MODULES

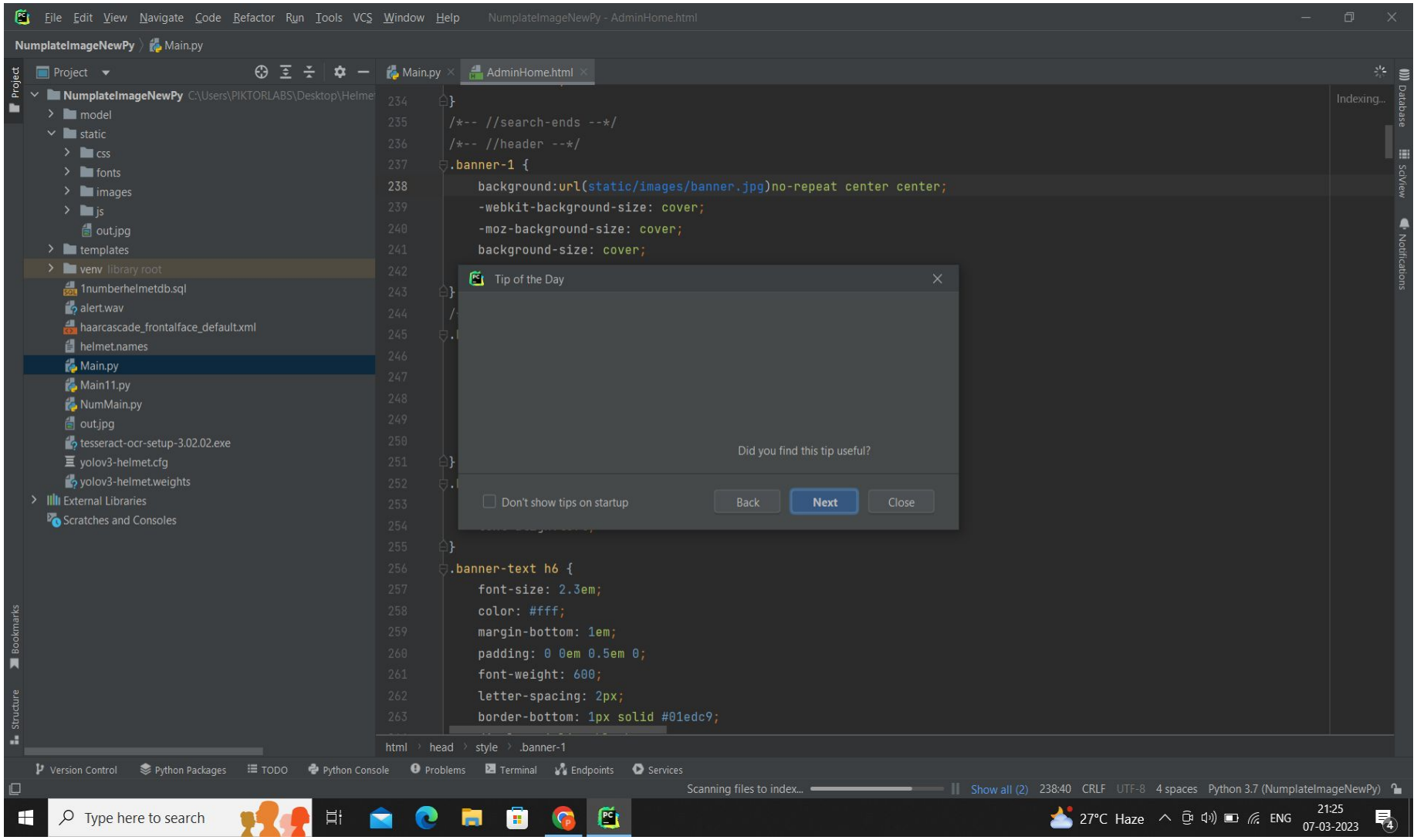
Number plate recognition:

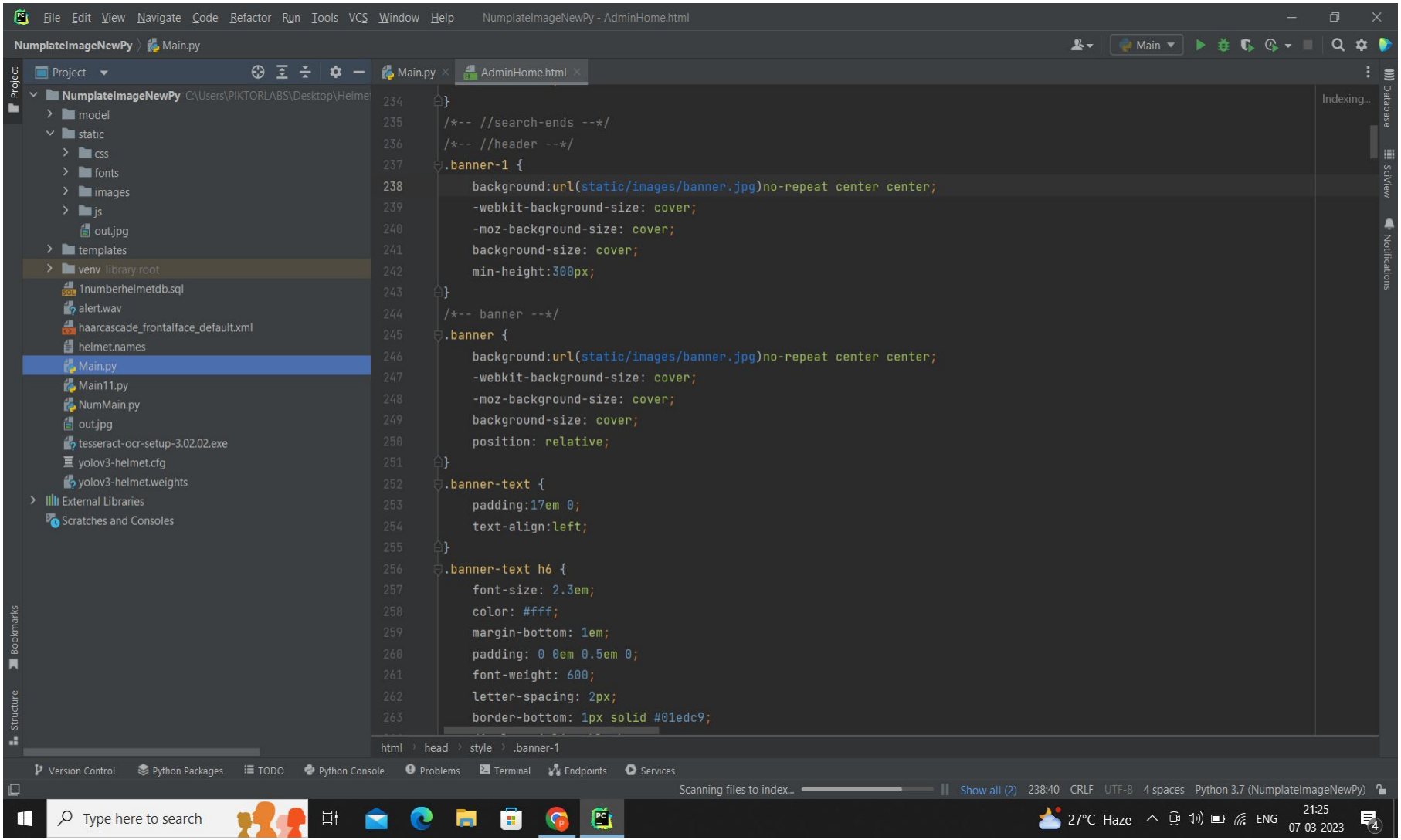
- In this module, number plate can be detected and recognized using Convolutional neural network algorithm
- First detect the text strokes in number plate and recognized the number
- Then return as Label box in real time camera capture
- Finally matched with database and extract the owner details

Alert system:

- In this module, recognized user details are extracted from database which are extracted from trained database
- And send the fine amount details to appropriate the user in the form of SMS alert

IMPLEMENTATION

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haarcascade_frontalface_default.xml
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NumMain.py
out.jpg
tesseract-ocr-setup-3.02.02.exe
yolov3-helmet.cfg
yolov3-helmet.weights
External Libraries
Scratches and Consoles
Indexing...
}
/*-- //search-ends --*/
/*-- //header --*/
.banner-1 {
background:url(static/images/banner.jpg)no-repeat center center;
-webkit-background-size: cover;
-moz-background-size: cover;
background-size: cover;
min-height:300px;
}
/*-- banner --*/
.banner {
background:url(static/images/banner.jpg)no-repeat center center;
-webkit-background-size: cover;
-moz-background-size: cover;
background-size: cover;
position: relative;
}
.banner-text {
padding:17em 0;
text-align:left;
}
.banner-text h6 {
font-size: 2.3em;
color: #fff;
margin-bottom: 1em;
padding: 0 0em 0.5em 0;
font-weight: 600;
letter-spacing: 2px;
border-bottom: 1px solid #01edc9;
html head style .banner-1
Version Control Python Packages TODO Python Console Problems Terminal Endpoints Services
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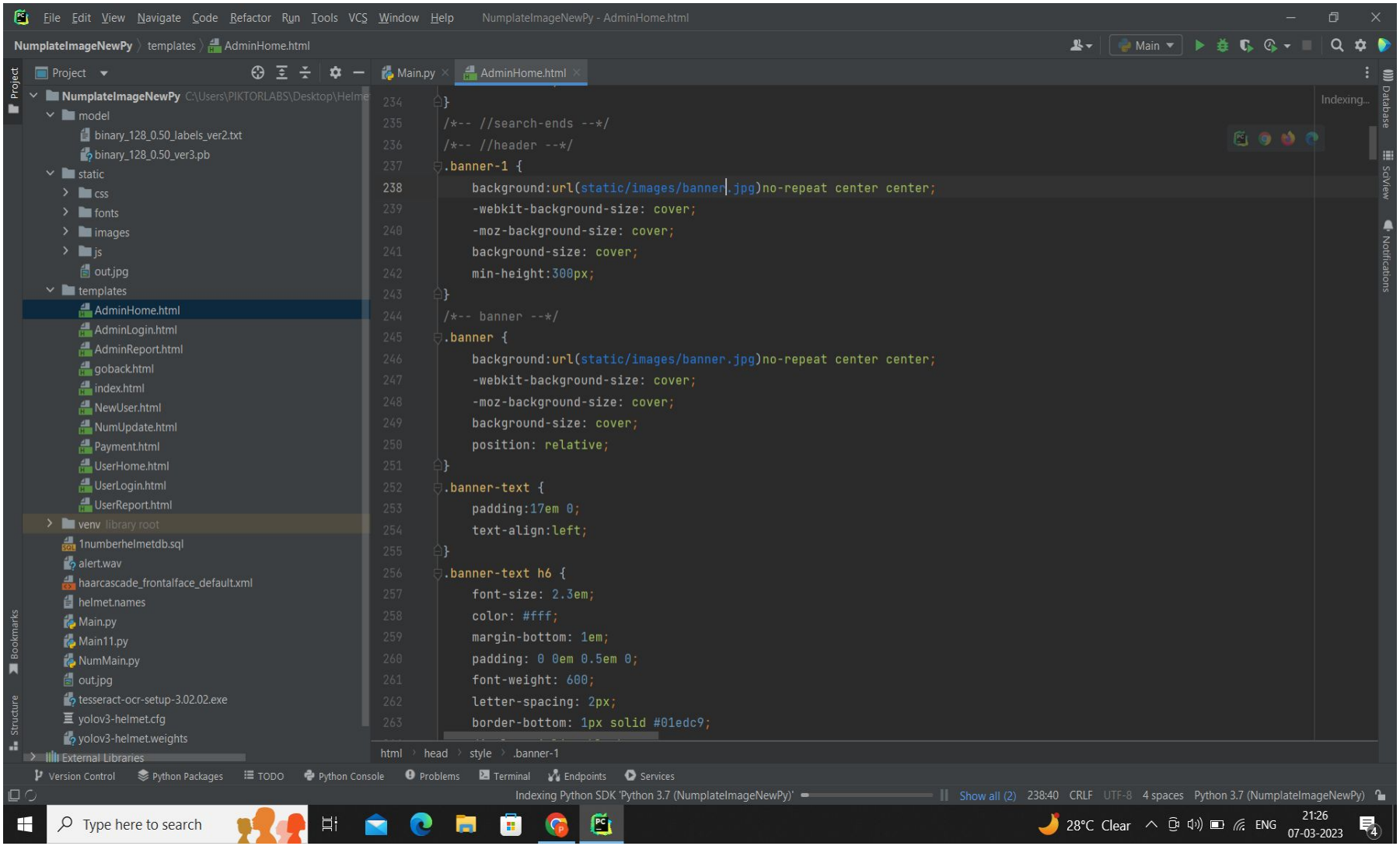
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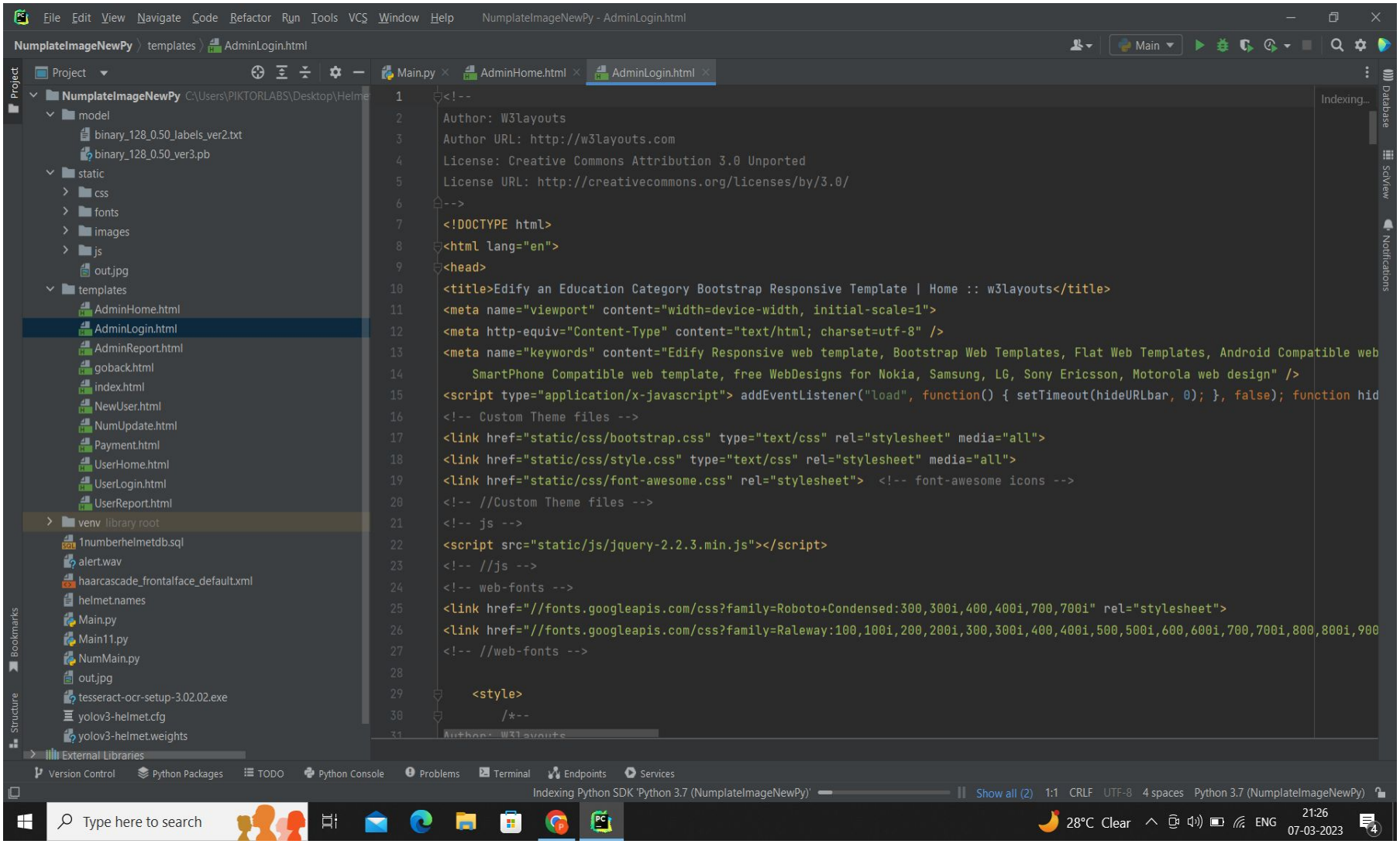
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Indexing...
<!--
Author: W3layouts
Author URL: http://w3layouts.com
License: Creative Commons Attribution 3.0 Unported
License URL: http://creativecommons.org/licenses/by/3.0/
-->
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SmartPhone Compatible web template, free WebDesigns for Nokia, Samsung, LG, Sony Ericsson, Motorola web design" />
<script type="application/x-javascript"> addEventListener("load", function() { setTimeout(hideURLbar, 0); }, false); function hid
<!-- Custom Theme files -->
<link href="static/css/bootstrap.css" type="text/css" rel="stylesheet" media="all">
<link href="static/css/style.css" type="text/css" rel="stylesheet" media="all">
<link href="static/css/font-awesome.css" rel="stylesheet"> <!-- font-awesome icons -->
<!-- //Custom Theme files -->
<!-- js -->
<script src="static/js/jquery-2.2.3.min.js"></script>
<!-- //js -->
<!-- web-fonts -->
<link href="//fonts.googleapis.com/css?family=Roboto+Condensed:300,300i,400,400i,700,700i" rel="stylesheet">
<link href="//fonts.googleapis.com/css?family=Raleway:100,100i,200,200i,300,300i,400,400i,500,500i,600,600i,700,700i,800,800i,900
<!-- //web-fonts -->
<style>
/*--
Author: W3layouts
Version Control
Python Packages
TODO
Python Console
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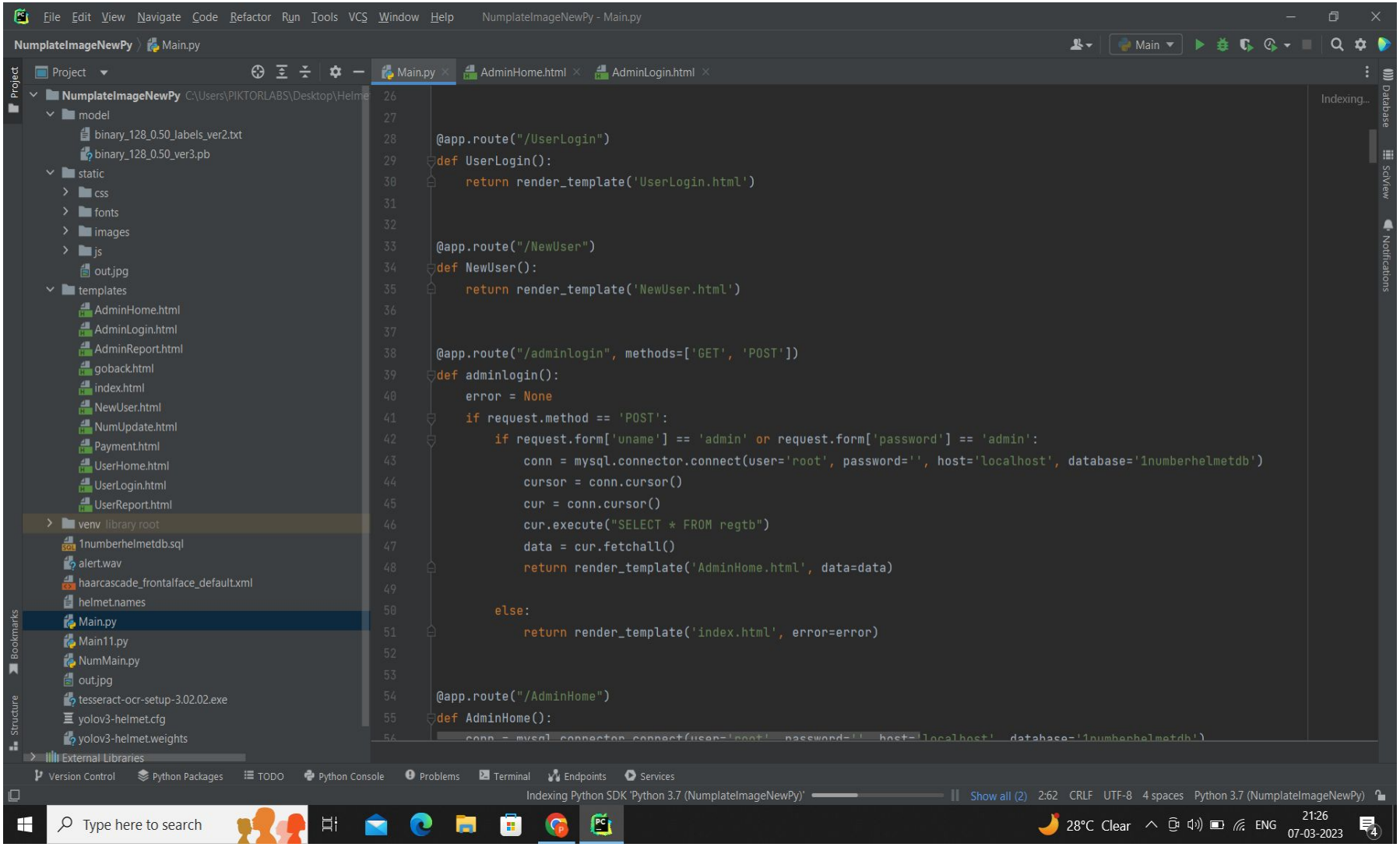
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Indexing...
@app.route("/UserLogin")
def UserLogin():
return render_template('UserLogin.html')
@app.route("/NewUser")
def NewUser():
return render_template('NewUser.html')
@app.route("/adminlogin", methods=['GET', 'POST'])
def adminlogin():
error = None
if request.method == 'POST':
if request.form['uname'] == 'admin' or request.form['password'] == 'admin':
conn = mysql.connector.connect(user='root', password='', host='localhost', database='1numberhelmetdb')
cursor = conn.cursor()
cur = conn.cursor()
cur.execute("SELECT * FROM regtb")
data = cur.fetchall()
return render_template('AdminHome.html', data=data)
else:
return render_template('index.html', error=error)
@app.route("/AdminHome")
def AdminHome():
Version Control
Python Packages
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Problems
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Endpoints
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07-03-2023

EXPECTED OUTCOMES

REFERENCES

1. Chen Z, Ellis T. Self-adaptive Gaussian mixture model for urban traffic monitoring system[C]//IEEE International Conference on Computer Vision Workshops. IEEE, 2011:1771-1772.
2. Dalal N,Triggs B. Histograms of Oriented Gradients for Human Detection[C]// 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition, CVPR 2005, IEEE,2005:886-893.
3. Burges CJC. A Tutorial on Support Vector Machines for Pattern Recognition[J]. Data Mining and Knowledge Discovery, 1998, 2(2):121-167.
4. Girshick R, Donahue J, Darrell T, et al. Rich Feature Hierarchies for Accurate Object Detection and Semantic Segmentation[C]// IEEE Conference on Computer Vision & Pattern Recognition. IEEE Computer Society, 2014:580- 587.
5. Girshick R. Fast R-CNN [C]// Proc of IEEE International Conference on Computer Vision,2015:1440-1448.

THANK YOU