Google Cloud Platform

Web application for recognizing vehicle number plates over GCP

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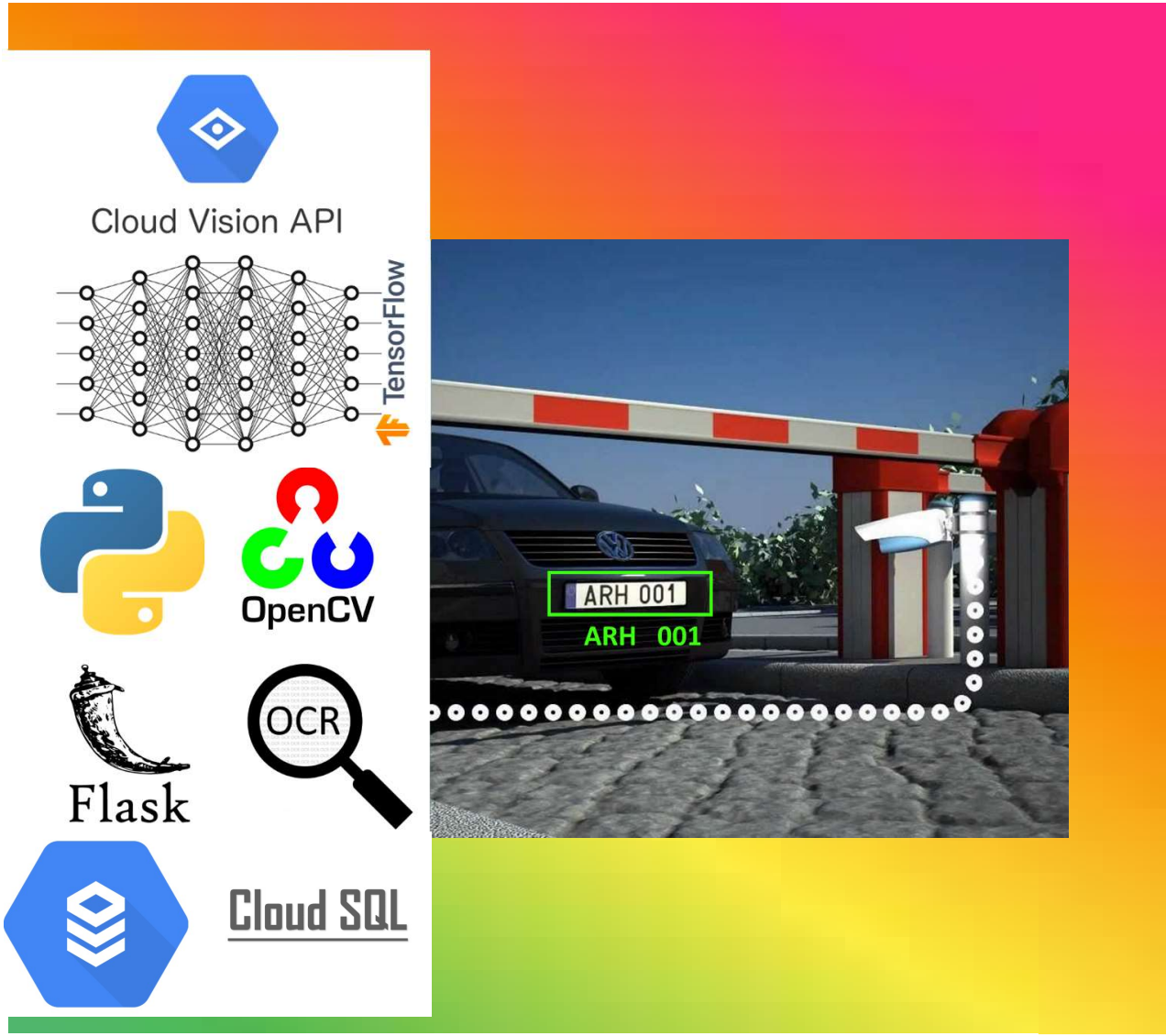
- Dnyanesh Walwadkar



Team – (Group 10)

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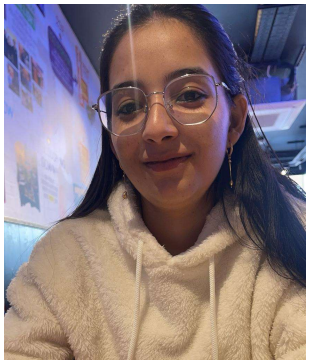

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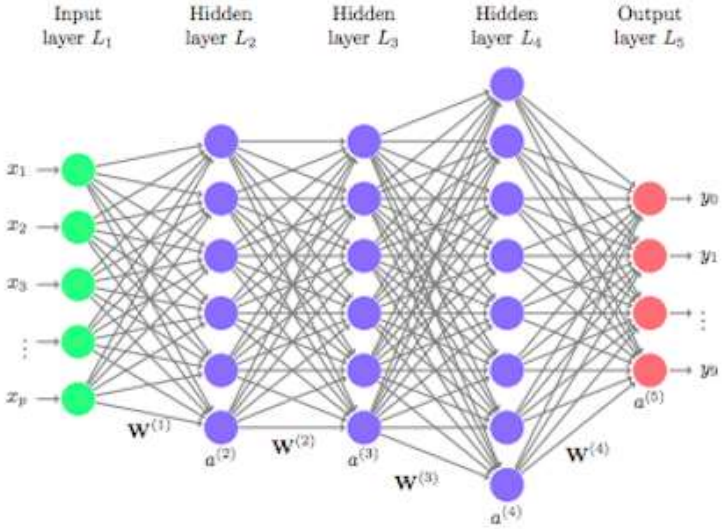
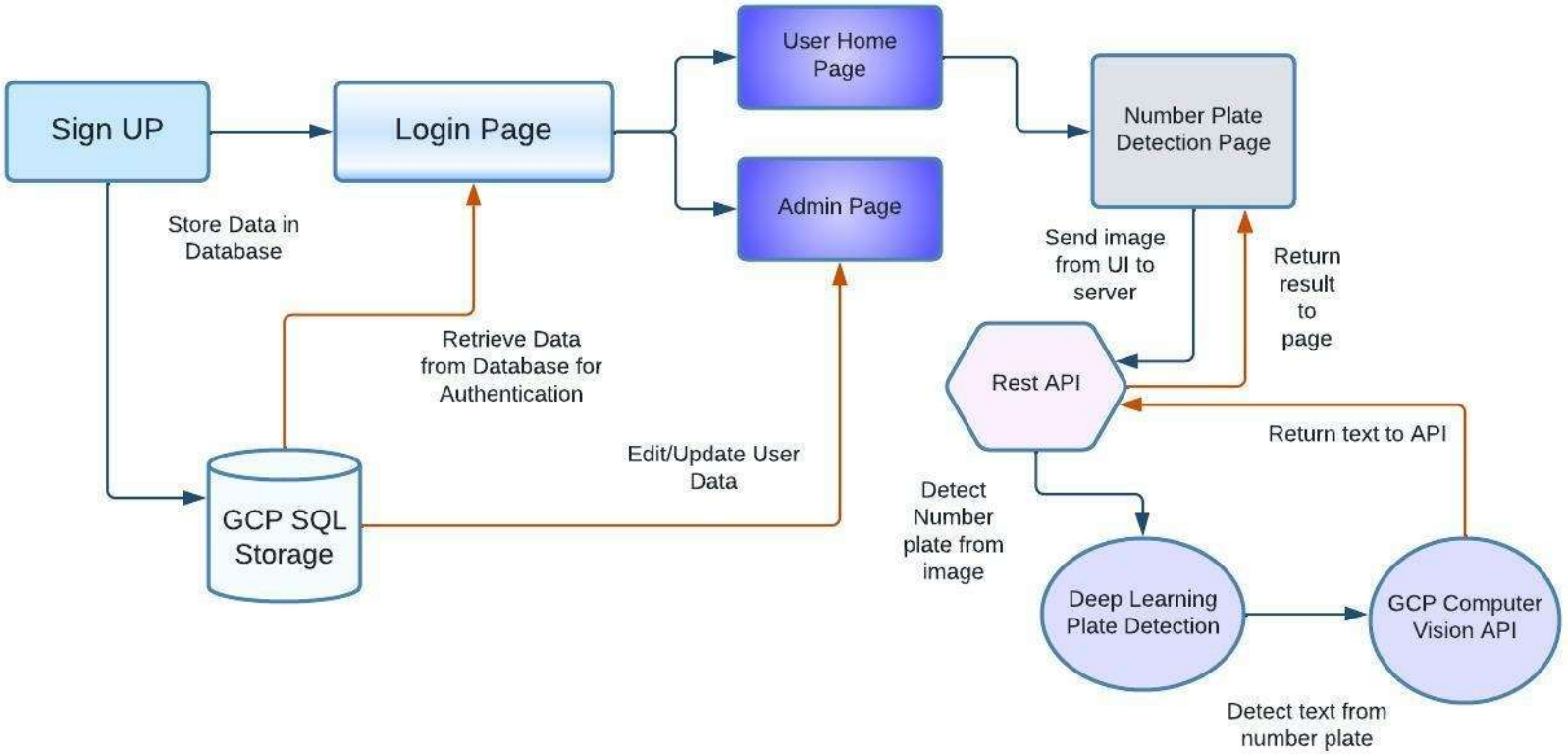


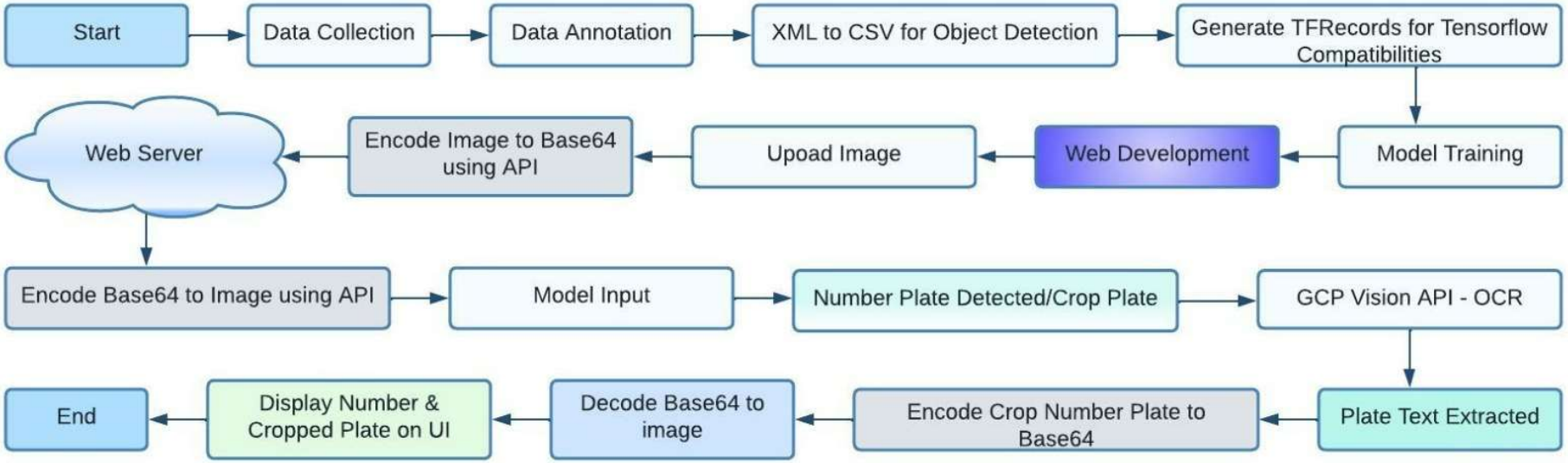
Agenda

- Project Introduction
- Cloud SQL for Data Storage
- Cloud Vision API & Deep Learning
- Deployment
- Conclusion

Project Architecture



Project Flow



TensorFlow

Result input to Google Cloud Vision API

Cloud Vision API

Detected text : KA 01 MR 8041

Deep Learning Algorithm

Library: TensorFlow 2.8

Deep Neural Network: SSD_Inception_v2 with 42ms Image Frame Processing speed with 28 COCO mAP

(Object Detection Task)

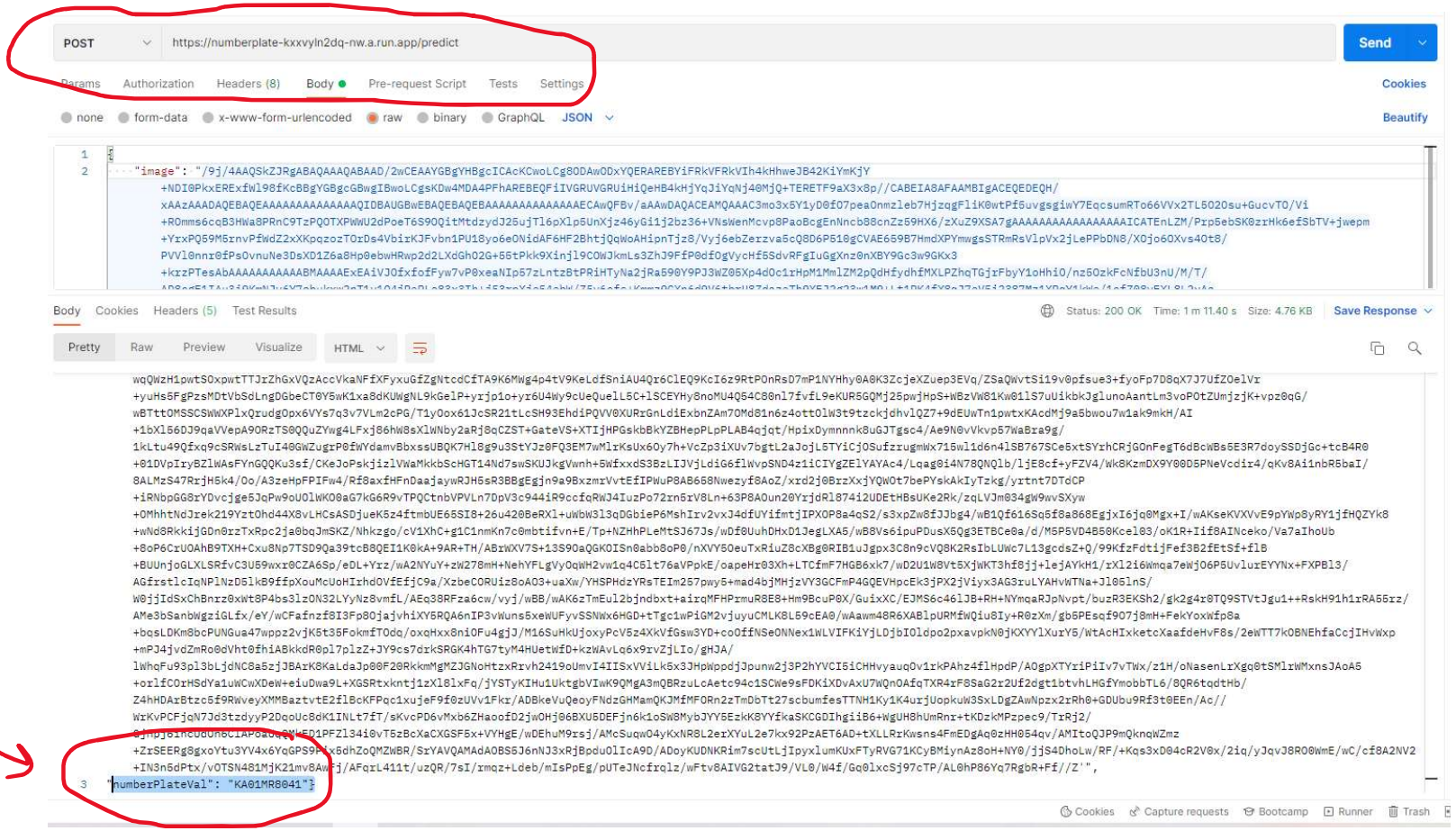
Google Vision API

Integrates Google Vision features, including image labeling, face, logo, and landmark detection, optical character recognition (OCR), and detection of explicit content, into applications.

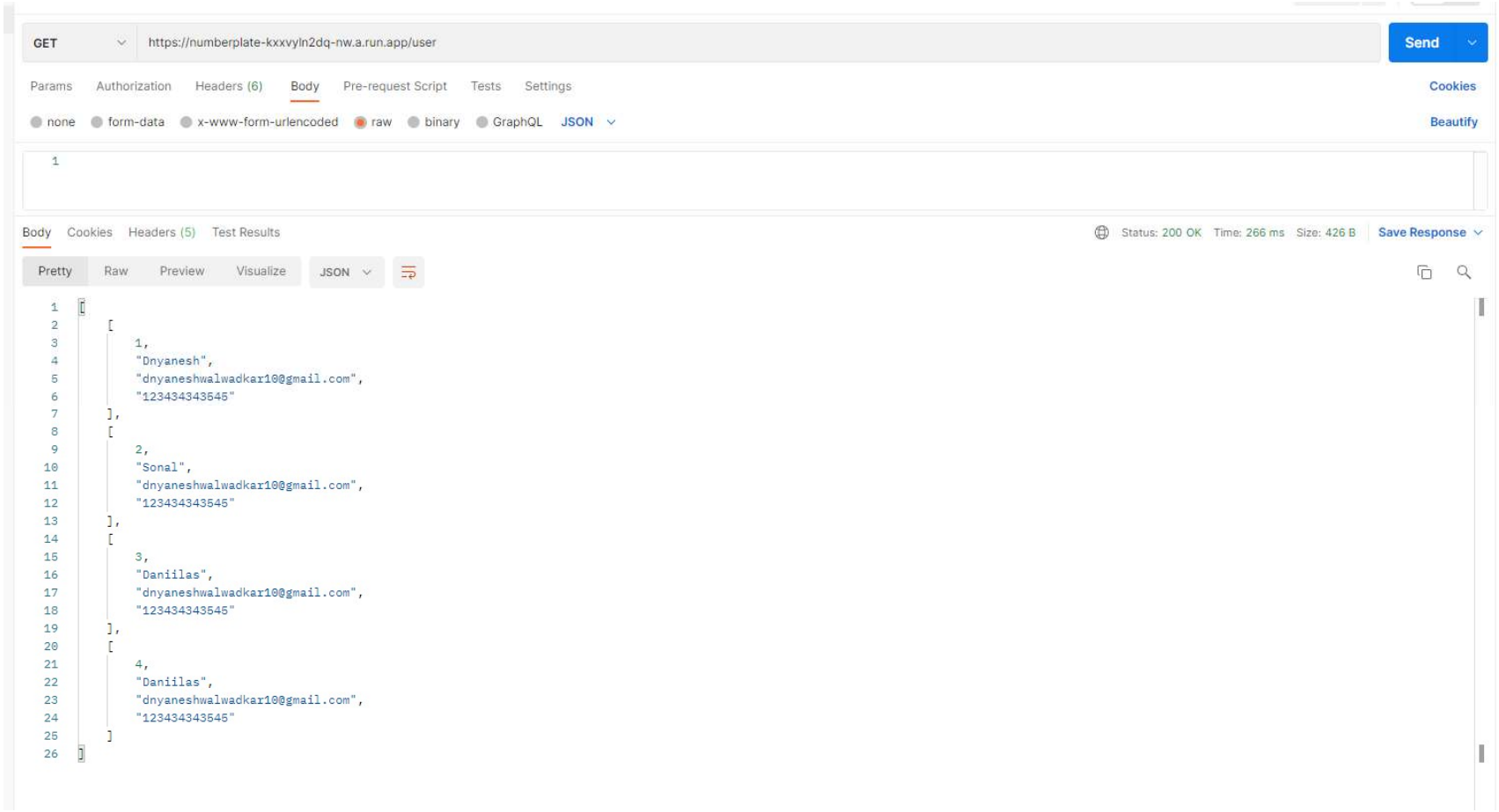
REST API CRUD Operations

REQUEST	Link	
[GET]	https://numberplate-kxxvyln2dq-nw.a.run.app/user	Displays ALL Users Data
[POST]	https://numberplate-kxxvyln2dq-nw.a.run.app/user	Insert New Users Data
[DELETE]	https://numberplate-kxxvyln2dq-nw.a.run.app/user/delete	Delete Specific user data by identifying mail
[POST]	https://numberplate-kxxvyln2dq-nw.a.run.app/user/update	Update user data
[POST]	https://numberplate-kxxvyln2dq-nw.a.run.app/plates	add Detected Number Plates to Database
[GET]	https://numberplate-kxxvyln2dq-nw.a.run.app/plates	Displays all NumberPlates Data

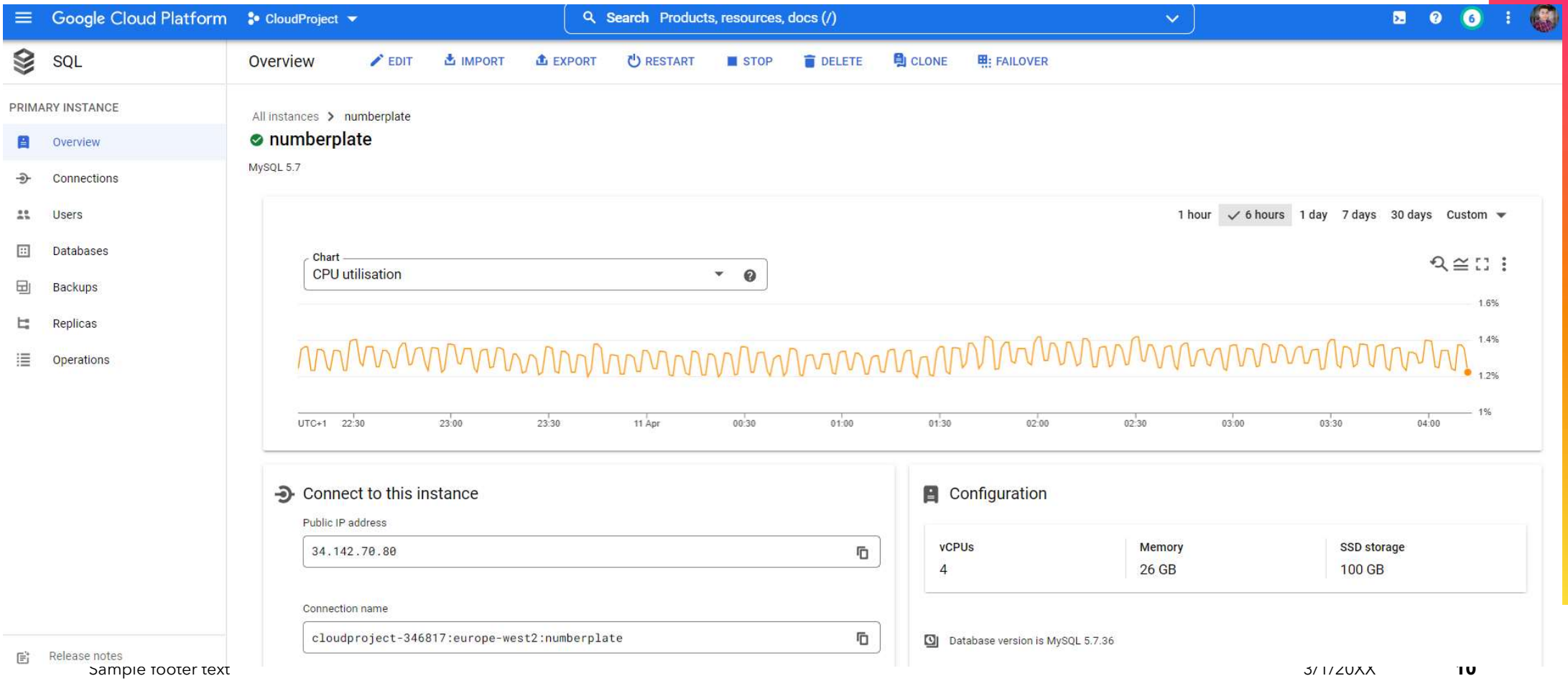
Image Number Plate Recognition & Cloud Vision API output Over Deployed app using Postman (Image in B64 Format)



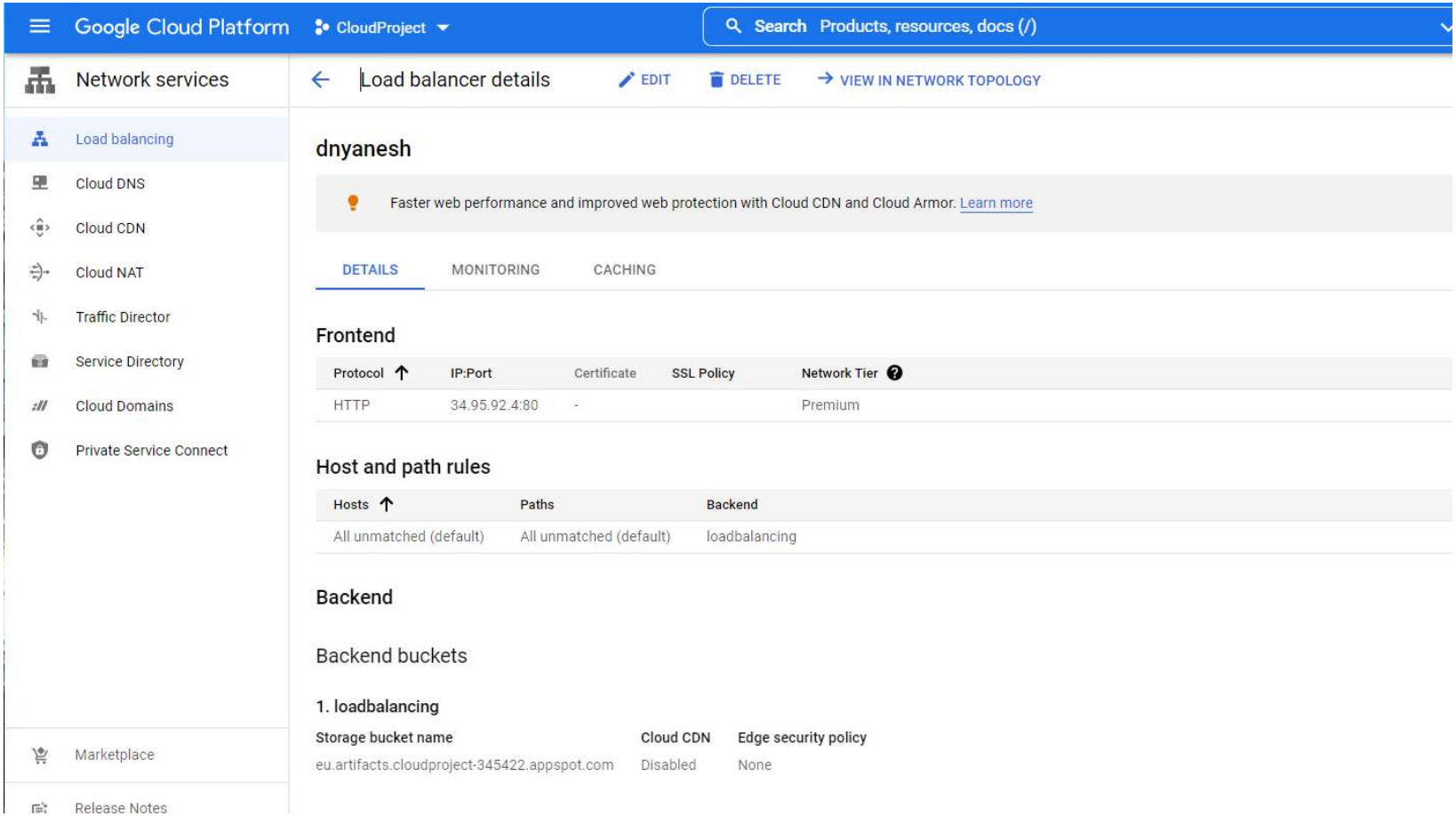
Google cloud SQl Output



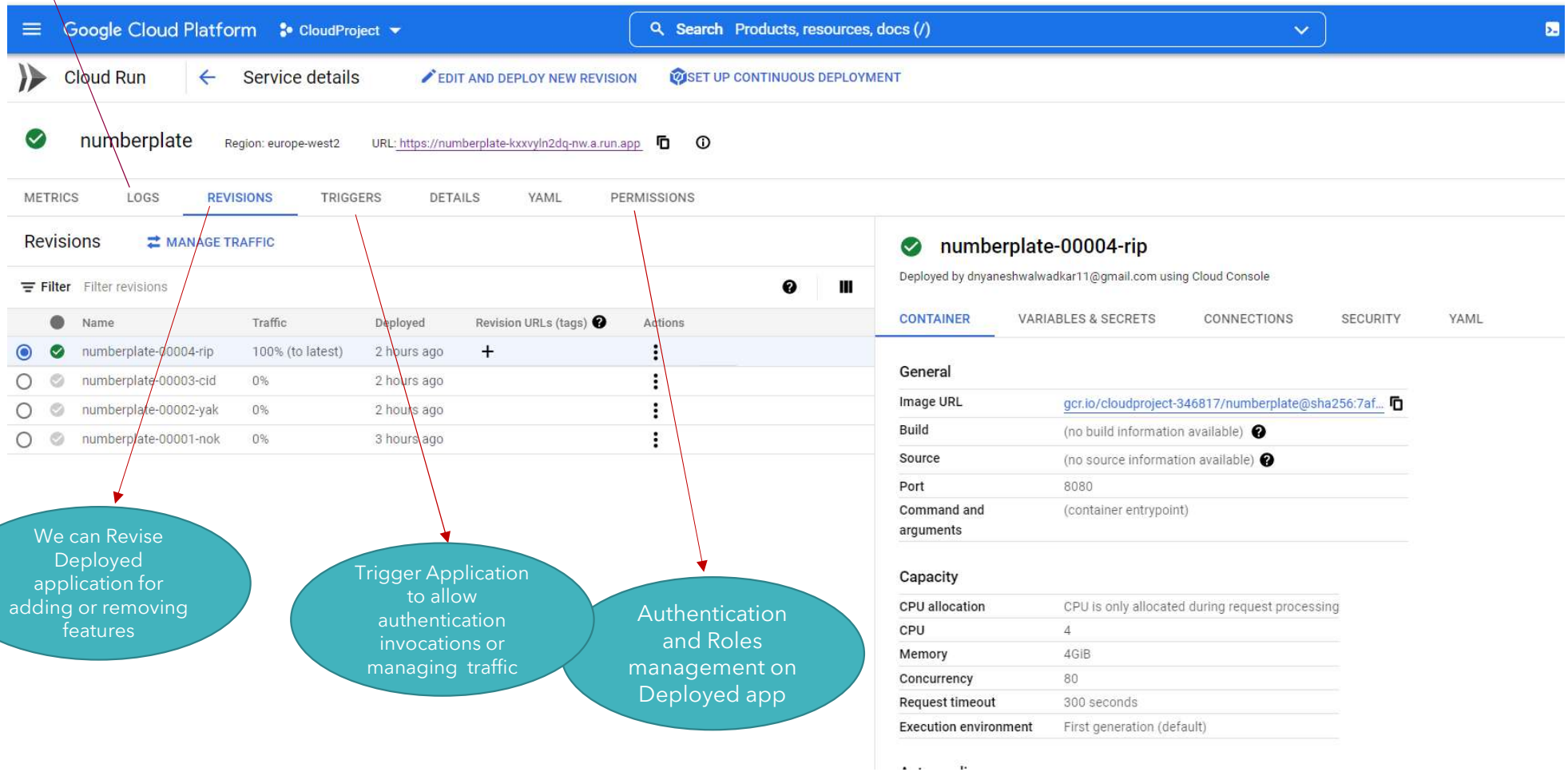
Cloud SQL


Google Cloud Platform
CloudProject
Search Products, resources, docs (/)
SQL
Overview
EDIT
IMPORT
EXPORT
RESTART
STOP
DELETE
CLONE
FAILOVER
PRIMARY INSTANCE
Overview
Connections
Users
Databases
Backups
Replicas
Operations
Release notes
All instances > numberplate
numberplate
MySQL 5.7
1 hour
6 hours
1 day
7 days
30 days
Custom
Chart
CPU utilisation
1.6%
1.4%
1.2%
1%
UTC+1
22:30
23:00
23:30
11 Apr
00:30
01:00
01:30
02:00
02:30
03:00
03:30
04:00
Connect to this instance
Public IP address
34.142.70.80
Connection name
cloudproject-346817:europe-west2:numberplate
Configuration
vCPUs
4
Memory
26 GB
SSD storage
100 GB
Database version is MySQL 5.7.36

Load Balancing

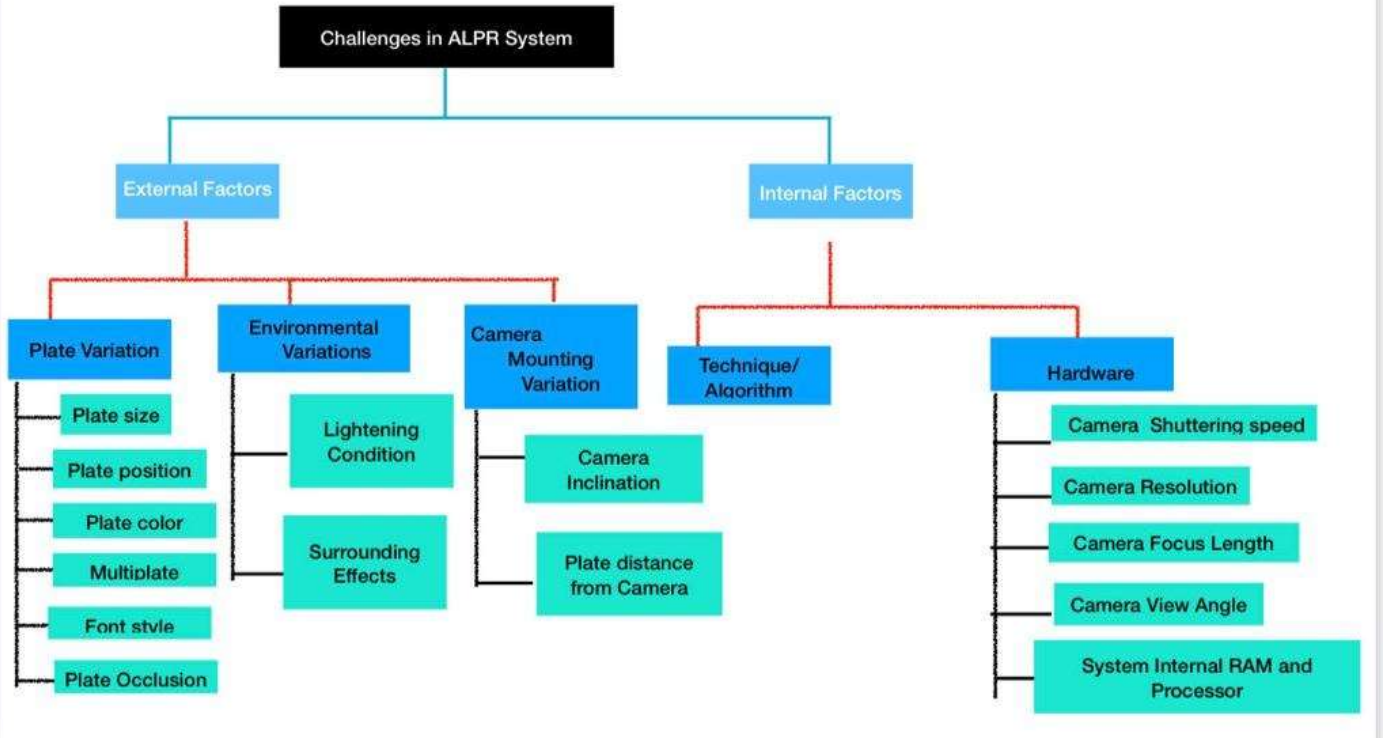


CLOUD Run -> Deployed Application



CLOUD Run -> Application Metrics

CHALLENGES IN AUTOMATIC NUMBER PLATE RECOGNITION SYSTEM (ALPR SYSTEM)



Conclusion

- Automatic Number Plate Recognition is a technology that uses optical character recognition to read vehicle registration plates. Initially, ANPR was used by police forces around the world for law enforcement purposes.
- However, it soon entered the security market as more and more providers saw the benefits of utilising this solution for applications such as electronic toll collection, parking management and smart parking
- We plan to scale the application to runtime recognitions with video support in the near future.
- The integration of Deep Learning & Machine Learning models with web applications with the support of the Cloud is ideal for a wide range of applications.
- Integrating and deploying GCP is easy, and all application logs are readily accessible. The GCP APIs encompass a wide range of problems, including AI, databases, and virtual machines.

Thank You

Let’s build Future