Capstone Project Weekly Progress Report

Semester	Fall-2024 Semester 3rd
Course Code	AML-3406
Section	Section 1
Project Title	Car Damage Detection
Group Name	Group B
Student names/Student IDs	Sakshi (C0908000) Bansil Patel (C0912873) Harsh Mohile (C0912872) Meet Patel (C0910378) – TL Rachit Bhatt (C0902810)
Reporting Week	Week 4
Faculty Supervisor	William Pourmajidi

1. Grade the level of collaboration from different aspects between team members: (use: good, medium, below expectation)

Sakshi	Bansil Patel	Harsh Mohile	Meet Patel	Rachit Bhatt
Good	**Good**	**Good**	**Good**	**Good**

2. Tasks outlined in the previous Weekly Progress Report for this reporting week at the individual level and group level

2.1 Individual tasks (each team member)

Sakshi: Learning VS Code + Learning GitHub.
Bansil Patel & Meet Patel: Learning VS Code + Exploring Dataset.
Harsh Mohile & Rachit Bhatt: Learning VS Code + Creating Branches for automation and deployment, and over Git Management.

2.2 Your team's tasks

- Adapting VS-Code as IDE for development and version control.
- GitHub Management.
- Exploring Dataset.

3. Progress made in Reporting Week at an individual level and group level

3.1 Individual progress

Sakshi: Understood basics of VS-Code Extensions and GitHub.
Bansil Patel & Meet Patel: Applying NN and Model Evaluation through Summary.
Harsh Mohile: Worked on the **quality-assurance** branch for applying test automation.
Rachit Bhatt: Worked on the **production** branch for launching the tested piece of solution to the cloud.

3.2 Your team's progress

- GitHub Management for Deployment and Test-Automation.
- Applying initial NN function and testing the results on the sample data.

4. The areas/tasks you could not make progress and/or complete as scheduled or the difficulties encountered in this reporting week at individual level and group level.

4.1 Individual project blockers

Sakshi: N/A
Bansil Patel: N/A
Harsh Mohile: N/A
Meet Patel: N/A
Rachit Bhatt: N/A

4.2 Your team's project blockers

- Since the tasks of this scrum were quite smooth, ✊ luckily; there were no blockers in this week.

5. Tasks to be completed in next week at individual level and group level

5.1 Individual tasks

Sakshi: Research on CI/CD Pipelining for ML-Ops.

Bansil Patel & Meet Patel: Applying various models initially on the dataset.

Harsh Mohile & Rachit Bhatt: Research on Docker for Deployment.

5.2 Your team's tasks

- Exploring and understanding the dataset.
- Research on Docker for Deployment.

6. Include the tasks from your sprint planning (Github/Zenhub) for the present period.

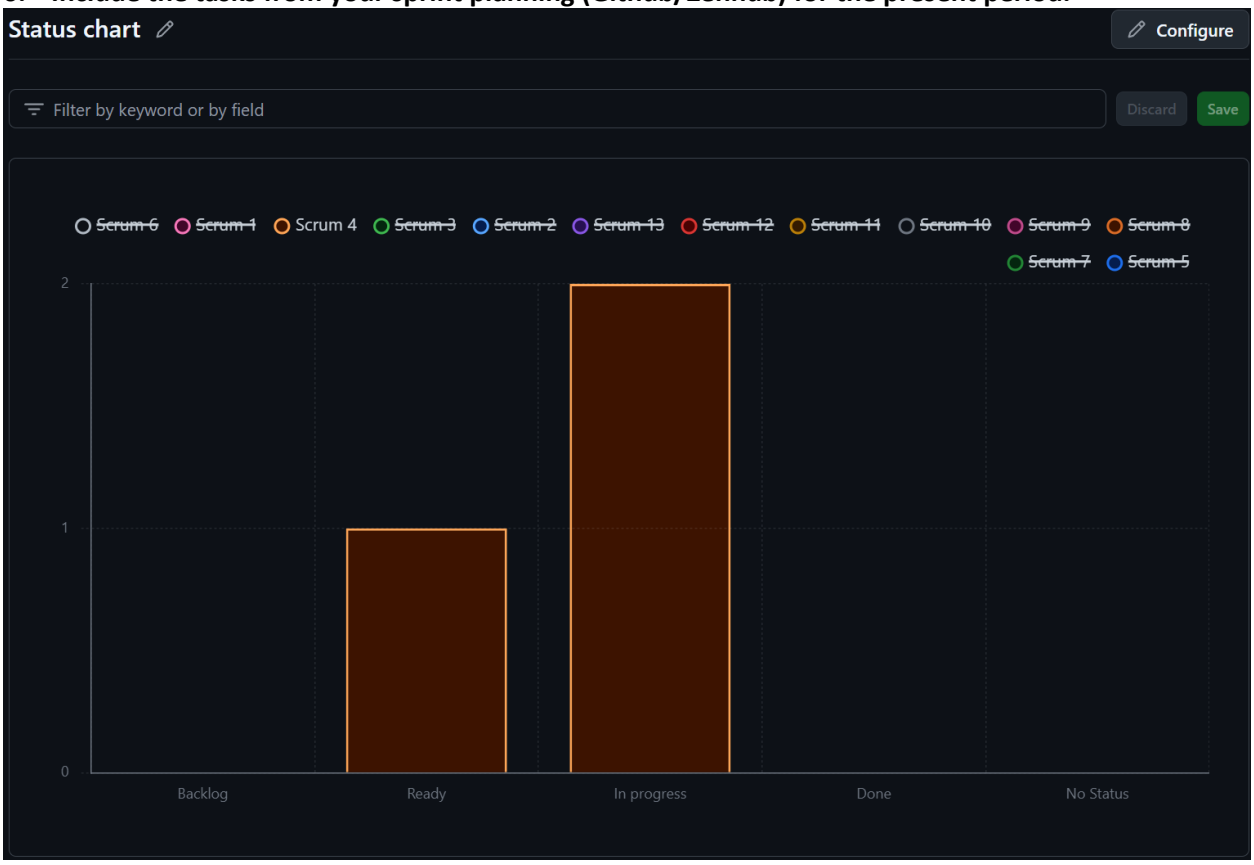

Figure 1: Status Chart of GitHub Issues in Milestone

7. Include charts/graphs (e.g., burn down charts) from your project management tool (Github/Zenhub) that shows your progress for the period of this report.

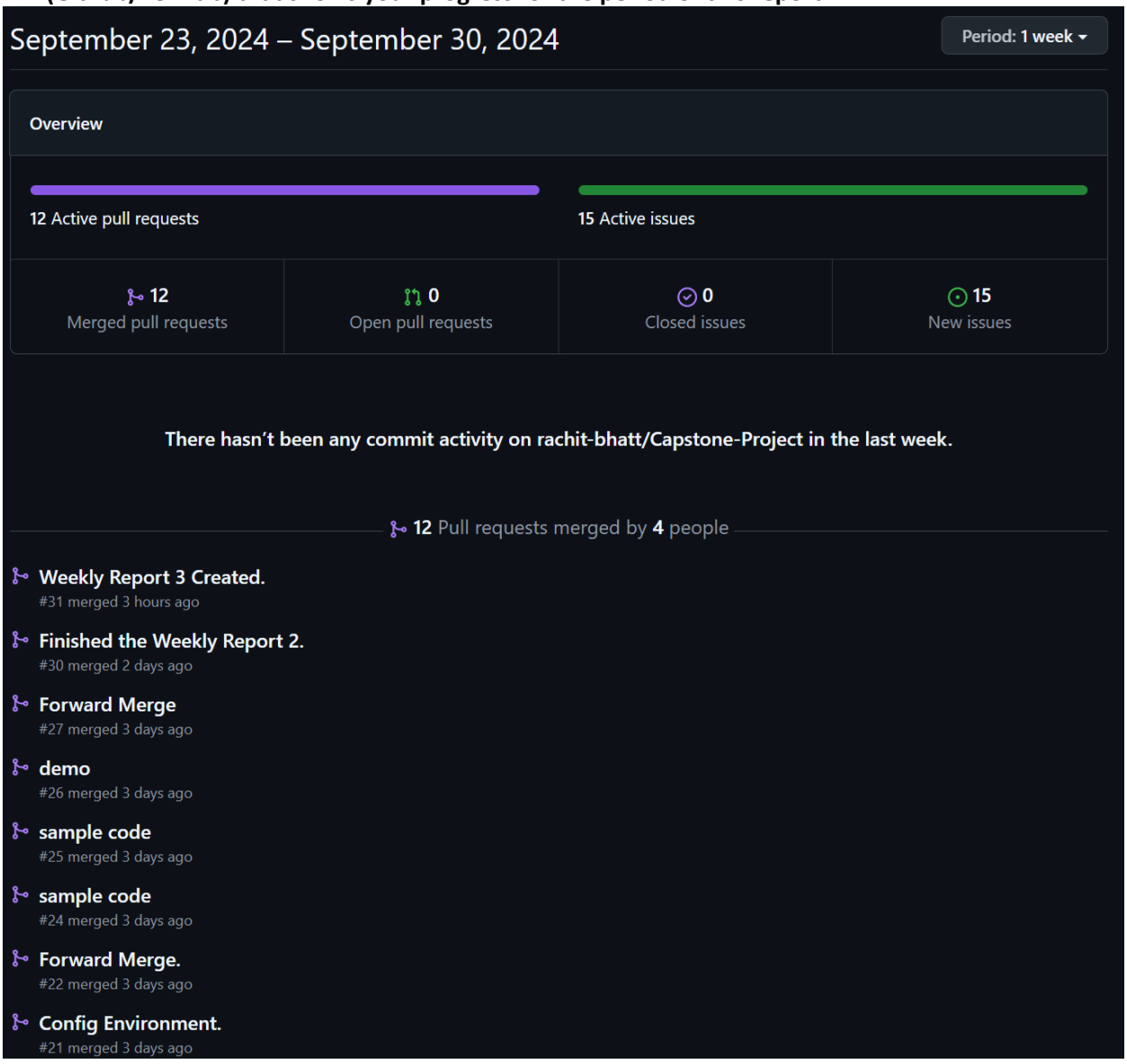

Figure 2: Contributors in the Week

8. **Include a note and address to your project Github with list of codes uploaded/updated on Github in this reporting week.**

GitHub: https://www.github.com/rachit-bhatt/Capstone-Project

```
epochs=5

# Train the model
history_eff = model_eff.fit(
    train_ds,
    epochs=epochs,
    validation_data=valid_ds,
    verbose=1,
)

# Save training and validation histories for later analysis
all_train_histories = [history_eff.history['accuracy']]
all_val_histories = [history_eff.history['val_accuracy']]
```

```
Epoch 1/5
35/35 ━━━━━━━━━━━━━━━━━━━━ 188s 5s/step - AUC: 0.6027 - accuracy: 0.3963 - f1_score: 0.1340 - loss: 10.3684 - val_AUC: 0.5114 - val_accuracy: 0.3745 - val_f1_score: 0.3554 - val_loss: 396.7017
Epoch 2/5
35/35 ━━━━━━━━━━━━━━━━━━━━ 250s 7s/step - AUC: 0.5140 - accuracy: 0.3471 - f1_score: 0.0000e+00 - loss: 5.8994 - val_AUC: 0.4966 - val_accuracy: 0.3636 - val_f1_score: 0.2646 - val_loss: 52.6579
Epoch 3/5
35/35 ━━━━━━━━━━━━━━━━━━━━ 209s 6s/step - AUC: 0.4978 - accuracy: 0.3455 - f1_score: 0.0000e+00 - loss: 5.2170 - val_AUC: 0.5377 - val_accuracy: 0.3818 - val_f1_score: 0.1321 - val_loss: 15.6876
Epoch 4/5
35/35 ━━━━━━━━━━━━━━━━━━━━ 157s 4s/step - AUC: 0.5134 - accuracy: 0.3648 - f1_score: 0.0000e+00 - loss: 4.7851 - val_AUC: 0.5799 - val_accuracy: 0.3927 - val_f1_score: 0.0608 - val_loss: 8.3147
Epoch 5/5
35/35 ━━━━━━━━━━━━━━━━━━━━ 159s 5s/step - AUC: 0.4948 - accuracy: 0.3574 - f1_score: 0.0000e+00 - loss: 4.4633 - val_AUC: 0.5314 - val_accuracy: 0.3236 - val_f1_score: 0.0583 - val_loss: 8.4688
```

Figure 3: Applying NN on a Sample Dataset

```
img_shape = (img_size[0], img_size[1], 3)

base_model = DenseNet169(include_top=False, weights="imagenet", input_shape=img_shape, pooling='max')
base_model.trainable = True
x = base_model.output
x = BatchNormalization(axis=-1, momentum=0.99, epsilon=0.001)(x)
x = Dense(256, kernel_regularizer=regularizers.l2(0.016),
          activity_regularizer=regularizers.l1(0.006),
          bias_regularizer=regularizers.l1(0.006), activation='relu')(x)
x = Dropout(rate=.4, seed=123)(x)
output = Dense(class_count, activation='softmax')(x)
model_eff = Model(inputs=base_model.input, outputs=output)
model_eff.compile(Adamax(learning_rate=lr), loss='categorical_crossentropy',
                  metrics=['accuracy', 'AUC', F1Score()])

model_eff.summary()
```

```
Model: "functional"
```

Layer (type)	Output Shape	Param #	Connected to
input_layer (InputLayer)	(None, 224, 224, 3)	0	-
zero_padding2d (ZeroPadding2D)	(None, 230, 230, 3)	0	input_layer[0][0]
conv1_conv (Conv2D)	(None, 112, 112, 64)	9,408	zero_padding2d[0…
conv1_bn (BatchNormalizatio…	(None, 112, 112, 64)	256	conv1_conv[0][0]

Figure 4: Model Evaluation Summary