

Model Development Phase Template

Date	18 July 2024
Team ID	SWTID1720277644
Project Title	Rice Classification using CNN
Maximum Marks	10 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include a summary and training and validation performance metrics for multiple models, presented through respective screenshots.

Initial Model Training Code (5 marks):

```
from keras.models import Sequential
from keras.layers import Conv2D, MaxPooling2D, Flatten, Dense
# Set the input shape for the model
input_shape = (50, 50, 3)

# Create a Sequential model
model = Sequential()
model.add(Conv2D(32, kernel_size=(3, 3), activation='relu', input_shape=input_shape))
model.add(MaxPooling2D(pool_size=(2, 2)))
model.add(Conv2D(64, kernel_size=(3, 3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2, 2)))
model.add(Flatten())
model.add(Dense(128, activation='relu'))
model.add(Dense(5, activation='softmax'))

# Compile the model
model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])
```

```
# Train the model on the training data
```

```
history = model.fit_generator(train_generator, epochs=5, validation_data=test_generator)
```

```
Epoch 1/5
1875/1875 [=====] - 714s 380ms/step - loss: 0.3933 - accuracy: 0.8
412 - val_loss: 0.2265 - val_accuracy: 0.9163
Epoch 2/5
1875/1875 [=====] - 272s 145ms/step - loss: 0.1577 - accuracy: 0.9
423 - val_loss: 0.1303 - val_accuracy: 0.9519
Epoch 3/5
1875/1875 [=====] - 284s 151ms/step - loss: 0.1051 - accuracy: 0.9
622 - val_loss: 0.0603 - val_accuracy: 0.9786
Epoch 4/5
1875/1875 [=====] - 273s 146ms/step - loss: 0.0871 - accuracy: 0.9
689 - val_loss: 0.0951 - val_accuracy: 0.9643
Epoch 5/5
1875/1875 [=====] - 267s 143ms/step - loss: 0.0743 - accuracy: 0.9
740 - val_loss: 0.0624 - val_accuracy: 0.9788
```

Model Validation and Evaluation Report (5 marks):

Model	Summary	Training and Validation Performance Metrics
CNN	<p>Accuracy comparison between Validation and Train Data set</p>  <p>Loss comparison between Validation and Train Data set</p> 	<pre>In [13]: # Evaluate the model on the test data metrics = model.evaluate(test_generator) # Print the accuracy of the model print('Accuracy:', metrics[1])</pre> <pre>469/469 [=====] - 44s 91ms/step - loss: 0.0649 - accuracy: 0.9774 Accuracy: 0.977488884863739</pre>