

# Project Development Phase

## Model Performance Test

Date	16 February 2026
Team ID	LTVIP2026TMIDS88398
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	10 marks

### Model Performance Testing:

S.No.	Parameter	Values	Screenshot																									
1.	Model Summary	Base Model: Xception (Pre-trained on ImageNet) Include_top = False Input Shape = (299, 299, 3) Added Layers: Global Average Pooling + Dense + Dropout Output Layer: Dense(5, activation='softmax') Optimizer: Adam Loss Function: Categorical Crossentropy Metrics: Accuracy	<pre>base_model = Xception(     weights='imagenet',     include_top=False,     input_shape=(299,299,3) )  for layer in base_model.layers:     layer.trainable = False  x = Flatten()(base_model.output) x = Dense(256, activation='relu')(x) x = Dropout(0.5)(x) output = Dense(5, activation='softmax')(x)  model = Model(inputs=base_model.input, outputs=output)  model.compile(     optimizer=Adam(learning_rate=0.0001),     loss='categorical_crossentropy',     metrics=['accuracy'] )</pre>																									
2.	Training Performance	Final Training Accuracy $\approx 77\%$ Final Validation Accuracy $\approx 78\%$  Training Performance Summary: Epoch 1 $\rightarrow$ Acc: 0.5132, Val Acc: 0.5876 Epoch 10 $\rightarrow$ Acc: 0.7425, Val Acc: 0.7892 Epoch 20 $\rightarrow$ Acc: 0.7534, Val Acc: 0.7956 Epoch 30 $\rightarrow$ Acc: 0.7755, Val Acc: 0.7834	<table><tr><th>Epoch</th><th>Loss</th><th>Accuracy</th><th>Val Loss</th><th>Val Accuracy</th></tr><tr><td>1</td><td>1.2845</td><td>0.5132</td><td>1.0234</td><td>0.5876</td></tr><tr><td>10</td><td>0.6760</td><td>0.7425</td><td>0.6101</td><td>0.7892</td></tr><tr><td>20</td><td>0.6245</td><td>0.7534</td><td>0.5674</td><td>0.7956</td></tr><tr><td>30</td><td>0.5905</td><td>0.7755</td><td>0.5871</td><td>0.7834</td></tr></table>	Epoch	Loss	Accuracy	Val Loss	Val Accuracy	1	1.2845	0.5132	1.0234	0.5876	10	0.6760	0.7425	0.6101	0.7892	20	0.6245	0.7534	0.5674	0.7956	30	0.5905	0.7755	0.5871	0.7834
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3.	Model Saving	Model saved as: updated_xception_diabetic_retinopathy.h5 Stored in model directory for Flask integration.	<pre>model.save("updated_xception_diabetic_retinopathy.h5")</pre>
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