

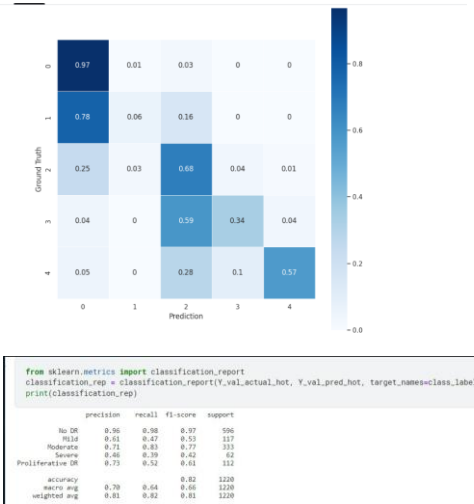
Performance & Final Submission Phase

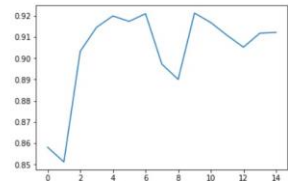
Model Performance Test

Date	22 November 2023
Team ID	PNT2023TMID592236
Project Name	Project - Deep Learning Fundus Image Analysis For Early Detection of Diabetic Retinopathy.
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot																																													
1.		Classification Model: Confusion Matrix - , Accuray Score- & Classification Report -	 <pre>from sklearn.metrics import classification_report classification_rep = classification_report(Y_val_actual_hot, Y_val_pred_hot, target_names=class_labels) print(classification_rep)</pre> <table><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr><tr><td>No DR</td><td>0.96</td><td>0.98</td><td>0.97</td><td>106</td></tr><tr><td>Mild</td><td>0.61</td><td>0.47</td><td>0.53</td><td>117</td></tr><tr><td>Moderate</td><td>0.71</td><td>0.83</td><td>0.77</td><td>133</td></tr><tr><td>Severe</td><td>0.46</td><td>0.39</td><td>0.42</td><td>62</td></tr><tr><td>Proliferative DR</td><td>0.73</td><td>0.52</td><td>0.61</td><td>112</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.82</td><td>1228</td></tr><tr><td>macro avg</td><td>0.70</td><td>0.64</td><td>0.66</td><td>1228</td></tr><tr><td>weighted avg</td><td>0.81</td><td>0.82</td><td>0.81</td><td>1228</td></tr></table>		precision	recall	f1-score	support	No DR	0.96	0.98	0.97	106	Mild	0.61	0.47	0.53	117	Moderate	0.71	0.83	0.77	133	Severe	0.46	0.39	0.42	62	Proliferative DR	0.73	0.52	0.61	112	accuracy			0.82	1228	macro avg	0.70	0.64	0.66	1228	weighted avg	0.81	0.82	0.81	1228
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1.	Tune the Model	Hyperparameter Tuning - Validation Method -	<pre>98/97 [=====] - 34s 349ms/step - loss: 0.9870 - acc: 0.9668 - val_loss: 0.8917 - val_acc: 0.9647 val_kappa: 0.9168 Epoch 12/15 98/97 [=====] - 34s 345ms/step - loss: 0.8638 - acc: 0.9668 - val_loss: 0.1000 - val_acc: 0.9622 val_kappa: 0.9188 Epoch 13/15 98/97 [=====] - 34s 351ms/step - loss: 0.8779 - acc: 0.9699 - val_loss: 0.1007 - val_acc: 0.9636 val_kappa: 0.9052 Epoch 14/15 98/97 [=====] - 34s 348ms/step - loss: 0.8727 - acc: 0.9723 - val_loss: 0.1007 - val_acc: 0.9644 val_kappa: 0.9118 Epoch 15/15 98/97 [=====] - 34s 358ms/step - loss: 0.8671 - acc: 0.9747 - val_loss: 0.1035 - val_acc: 0.9636 val_kappa: 0.9122</pre> <pre>In [21]: kappa_metrics = Metrics() history = model.fit_generator(data_generator, steps_per_epoch=x_train.shape[0] // BATCH_SIZE, epochs=15, validation_data=(x_val, y_val), callbacks=[kappa_metrics])</pre>																																
			<pre>In [23]: plt.plot(kappa_metrics.val_kappas)</pre> <pre>Out[23]: [matplotlib.lines.Line2D at 0x7f93ec68b208]</pre>  <table><caption>Validation Kappa Values by Epoch</caption><tr><th>Epoch</th><th>Validation Kappa</th></tr><tr><td>0</td><td>0.855</td></tr><tr><td>1</td><td>0.860</td></tr><tr><td>2</td><td>0.905</td></tr><tr><td>3</td><td>0.915</td></tr><tr><td>4</td><td>0.918</td></tr><tr><td>5</td><td>0.915</td></tr><tr><td>6</td><td>0.910</td></tr><tr><td>7</td><td>0.890</td></tr><tr><td>8</td><td>0.910</td></tr><tr><td>9</td><td>0.915</td></tr><tr><td>10</td><td>0.910</td></tr><tr><td>11</td><td>0.905</td></tr><tr><td>12</td><td>0.910</td></tr><tr><td>13</td><td>0.910</td></tr><tr><td>14</td><td>0.910</td></tr></table>	Epoch	Validation Kappa	0	0.855	1	0.860	2	0.905	3	0.915	4	0.918	5	0.915	6	0.910	7	0.890	8	0.910	9	0.915	10	0.910	11	0.905	12	0.910	13	0.910	14	0.910
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