

Testing Results for NTUC Capstone

	Logistic Regression	XGBoost																																																												
SMOTE not done on dataset	Accuracy is : 0.9514866979655712	Accuracy is : 0.9475743348982786																																																												
Outliers Intact	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.95</td><td>1.00</td><td>0.98</td><td>1216</td></tr><tr><td>1</td><td>0.00</td><td>0.00</td><td>0.00</td><td>62</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.95</td><td>1278</td></tr><tr><td>macro avg</td><td>0.48</td><td>0.50</td><td>0.49</td><td>1278</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.95</td><td>0.93</td><td>1278</td></tr></tbody></table> <div>Confusion Matrix</div> <p>True labels</p> <p>Predicted labels</p>		precision	recall	f1-score	support	0	0.95	1.00	0.98	1216	1	0.00	0.00	0.00	62	accuracy			0.95	1278	macro avg	0.48	0.50	0.49	1278	weighted avg	0.91	0.95	0.93	1278	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.95</td><td>1.00</td><td>0.97</td><td>1216</td></tr><tr><td>1</td><td>0.14</td><td>0.02</td><td>0.03</td><td>62</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.95</td><td>1278</td></tr><tr><td>macro avg</td><td>0.55</td><td>0.51</td><td>0.50</td><td>1278</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.95</td><td>0.93</td><td>1278</td></tr></tbody></table> <div>Confusion Matrix</div> <p>True labels</p> <p>Predicted labels</p>		precision	recall	f1-score	support	0	0.95	1.00	0.97	1216	1	0.14	0.02	0.03	62	accuracy			0.95	1278	macro avg	0.55	0.51	0.50	1278	weighted avg	0.91	0.95	0.93	1278
	precision	recall	f1-score	support																																																										
0	0.95	1.00	0.98	1216																																																										
1	0.00	0.00	0.00	62																																																										
accuracy			0.95	1278																																																										
macro avg	0.48	0.50	0.49	1278																																																										
weighted avg	0.91	0.95	0.93	1278																																																										
	precision	recall	f1-score	support																																																										
0	0.95	1.00	0.97	1216																																																										
1	0.14	0.02	0.03	62																																																										
accuracy			0.95	1278																																																										
macro avg	0.55	0.51	0.50	1278																																																										
weighted avg	0.91	0.95	0.93	1278																																																										
SMOTE done on whole dataset before train and test split	Accuracy is : 0.917283950617284	Accuracy is : 0.9633744855967078																																																												
Outliers Intact	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.90</td><td>0.94</td><td>0.92</td><td>1215</td></tr><tr><td>1</td><td>0.94</td><td>0.90</td><td>0.92</td><td>1215</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.92</td><td>2430</td></tr><tr><td>macro avg</td><td>0.92</td><td>0.92</td><td>0.92</td><td>2430</td></tr><tr><td>weighted avg</td><td>0.92</td><td>0.92</td><td>0.92</td><td>2430</td></tr></tbody></table> <div>Confusion Matrix</div> <p>True labels</p> <p>Predicted labels</p>		precision	recall	f1-score	support	0	0.90	0.94	0.92	1215	1	0.94	0.90	0.92	1215	accuracy			0.92	2430	macro avg	0.92	0.92	0.92	2430	weighted avg	0.92	0.92	0.92	2430	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.96</td><td>0.97</td><td>0.96</td><td>1215</td></tr><tr><td>1</td><td>0.97</td><td>0.96</td><td>0.96</td><td>1215</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.96</td><td>2430</td></tr><tr><td>macro avg</td><td>0.96</td><td>0.96</td><td>0.96</td><td>2430</td></tr><tr><td>weighted avg</td><td>0.96</td><td>0.96</td><td>0.96</td><td>2430</td></tr></tbody></table> <div>Confusion Matrix</div> <p>True labels</p> <p>Predicted labels</p>		precision	recall	f1-score	support	0	0.96	0.97	0.96	1215	1	0.97	0.96	0.96	1215	accuracy			0.96	2430	macro avg	0.96	0.96	0.96	2430	weighted avg	0.96	0.96	0.96	2430
	precision	recall	f1-score	support																																																										
0	0.90	0.94	0.92	1215																																																										
1	0.94	0.90	0.92	1215																																																										
accuracy			0.92	2430																																																										
macro avg	0.92	0.92	0.92	2430																																																										
weighted avg	0.92	0.92	0.92	2430																																																										
	precision	recall	f1-score	support																																																										
0	0.96	0.97	0.96	1215																																																										
1	0.97	0.96	0.96	1215																																																										
accuracy			0.96	2430																																																										
macro avg	0.96	0.96	0.96	2430																																																										
weighted avg	0.96	0.96	0.96	2430																																																										

	Logistic Regression	XGBoost																																																																														
SMOTE done on Training dataset only	Accuracy is : 0.903755868544601	Accuracy is : 0.9311424100156495																																																																														
Outliers Intact	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.96</td><td>0.94</td><td>0.95</td><td>1216</td></tr><tr><td>1</td><td>0.16</td><td>0.23</td><td>0.19</td><td>62</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.90</td><td>1278</td></tr><tr><td>macro avg</td><td>0.56</td><td>0.58</td><td>0.57</td><td>1278</td></tr><tr><td>weighted avg</td><td>0.92</td><td>0.90</td><td>0.91</td><td>1278</td></tr></tbody></table> <div>Confusion Matrix</div> <table><thead><tr><th>True labels \ Predicted labels</th><th>0</th><th>1</th></tr></thead><tbody><tr><th>0</th><td>1141</td><td>75</td></tr><tr><th>1</th><td>48</td><td>14</td></tr></tbody></table>		precision	recall	f1-score	support	0	0.96	0.94	0.95	1216	1	0.16	0.23	0.19	62	accuracy			0.90	1278	macro avg	0.56	0.58	0.57	1278	weighted avg	0.92	0.90	0.91	1278	True labels \ Predicted labels	0	1	0	1141	75	1	48	14	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.95</td><td>0.97</td><td>0.96</td><td>1216</td></tr><tr><td>1</td><td>0.14</td><td>0.08</td><td>0.10</td><td>62</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.93</td><td>1278</td></tr><tr><td>macro avg</td><td>0.55</td><td>0.53</td><td>0.53</td><td>1278</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.93</td><td>0.92</td><td>1278</td></tr></tbody></table> <div>Confusion Matrix</div> <table><thead><tr><th>True labels \ Predicted labels</th><th>0</th><th>1</th></tr></thead><tbody><tr><th>0</th><td>1185</td><td>31</td></tr><tr><th>1</th><td>57</td><td>5</td></tr></tbody></table>		precision	recall	f1-score	support	0	0.95	0.97	0.96	1216	1	0.14	0.08	0.10	62	accuracy			0.93	1278	macro avg	0.55	0.53	0.53	1278	weighted avg	0.91	0.93	0.92	1278	True labels \ Predicted labels	0	1	0	1185	31	1	57	5
	precision	recall	f1-score	support																																																																												
0	0.96	0.94	0.95	1216																																																																												
1	0.16	0.23	0.19	62																																																																												
accuracy			0.90	1278																																																																												
macro avg	0.56	0.58	0.57	1278																																																																												
weighted avg	0.92	0.90	0.91	1278																																																																												
True labels \ Predicted labels	0	1																																																																														
0	1141	75																																																																														
1	48	14																																																																														
	precision	recall	f1-score	support																																																																												
0	0.95	0.97	0.96	1216																																																																												
1	0.14	0.08	0.10	62																																																																												
accuracy			0.93	1278																																																																												
macro avg	0.55	0.53	0.53	1278																																																																												
weighted avg	0.91	0.93	0.92	1278																																																																												
True labels \ Predicted labels	0	1																																																																														
0	1185	31																																																																														
1	57	5																																																																														
SMOTE done on Training dataset and Test dataset	Accuracy is : 0.9169407894736842	Accuracy is : 0.9177631578947368																																																																														
Outliers Intact	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.90</td><td>0.94</td><td>0.92</td><td>1216</td></tr><tr><td>1</td><td>0.94</td><td>0.90</td><td>0.92</td><td>1216</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.92</td><td>2432</td></tr><tr><td>macro avg</td><td>0.92</td><td>0.92</td><td>0.92</td><td>2432</td></tr><tr><td>weighted avg</td><td>0.92</td><td>0.92</td><td>0.92</td><td>2432</td></tr></tbody></table> <div>Confusion Matrix</div> <table><thead><tr><th>True labels \ Predicted labels</th><th>0</th><th>1</th></tr></thead><tbody><tr><th>0</th><td>1141</td><td>75</td></tr><tr><th>1</th><td>127</td><td>1089</td></tr></tbody></table>		precision	recall	f1-score	support	0	0.90	0.94	0.92	1216	1	0.94	0.90	0.92	1216	accuracy			0.92	2432	macro avg	0.92	0.92	0.92	2432	weighted avg	0.92	0.92	0.92	2432	True labels \ Predicted labels	0	1	0	1141	75	1	127	1089	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.88</td><td>0.97</td><td>0.92</td><td>1216</td></tr><tr><td>1</td><td>0.97</td><td>0.86</td><td>0.91</td><td>1216</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.92</td><td>2432</td></tr><tr><td>macro avg</td><td>0.92</td><td>0.92</td><td>0.92</td><td>2432</td></tr><tr><td>weighted avg</td><td>0.92</td><td>0.92</td><td>0.92</td><td>2432</td></tr></tbody></table> <div>Confusion Matrix</div> <table><thead><tr><th>True labels \ Predicted labels</th><th>0</th><th>1</th></tr></thead><tbody><tr><th>0</th><td>1185</td><td>31</td></tr><tr><th>1</th><td>169</td><td>1047</td></tr></tbody></table>		precision	recall	f1-score	support	0	0.88	0.97	0.92	1216	1	0.97	0.86	0.91	1216	accuracy			0.92	2432	macro avg	0.92	0.92	0.92	2432	weighted avg	0.92	0.92	0.92	2432	True labels \ Predicted labels	0	1	0	1185	31	1	169	1047
	precision	recall	f1-score	support																																																																												
0	0.90	0.94	0.92	1216																																																																												
1	0.94	0.90	0.92	1216																																																																												
accuracy			0.92	2432																																																																												
macro avg	0.92	0.92	0.92	2432																																																																												
weighted avg	0.92	0.92	0.92	2432																																																																												
True labels \ Predicted labels	0	1																																																																														
0	1141	75																																																																														
1	127	1089																																																																														
	precision	recall	f1-score	support																																																																												
0	0.88	0.97	0.92	1216																																																																												
1	0.97	0.86	0.91	1216																																																																												
accuracy			0.92	2432																																																																												
macro avg	0.92	0.92	0.92	2432																																																																												
weighted avg	0.92	0.92	0.92	2432																																																																												
True labels \ Predicted labels	0	1																																																																														
0	1185	31																																																																														
1	169	1047																																																																														

	Logistic Regression	XGBoost																																																																														
SMOTE done on Training dataset and Test dataset	Accuracy is : 0.9082308420056765	Accuracy is : 0.9016083254493851																																																																														
Outliers Removed	<div>Classification Report:<table><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr><tr><td>0</td><td>0.87</td><td>0.95</td><td>0.91</td><td>1057</td></tr><tr><td>1</td><td>0.95</td><td>0.86</td><td>0.90</td><td>1057</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.91</td><td>2114</td></tr><tr><td>macro avg</td><td>0.91</td><td>0.91</td><td>0.91</td><td>2114</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.91</td><td>0.91</td><td>2114</td></tr></table></div> <div><p>Confusion Matrix</p><table><tr><th></th><th>0</th><th>1</th></tr><tr><th>0</th><td>1008</td><td>49</td></tr><tr><th>1</th><td>145</td><td>912</td></tr></table></div>		precision	recall	f1-score	support	0	0.87	0.95	0.91	1057	1	0.95	0.86	0.90	1057	accuracy			0.91	2114	macro avg	0.91	0.91	0.91	2114	weighted avg	0.91	0.91	0.91	2114		0	1	0	1008	49	1	145	912	<div>Classification Report:<table><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr><tr><td>0</td><td>0.85</td><td>0.98</td><td>0.91</td><td>1057</td></tr><tr><td>1</td><td>0.98</td><td>0.82</td><td>0.89</td><td>1057</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.90</td><td>2114</td></tr><tr><td>macro avg</td><td>0.91</td><td>0.90</td><td>0.90</td><td>2114</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.90</td><td>0.90</td><td>2114</td></tr></table></div> <div><p>Confusion Matrix</p><table><tr><th></th><th>0</th><th>1</th></tr><tr><th>0</th><td>1038</td><td>19</td></tr><tr><th>1</th><td>189</td><td>868</td></tr></table></div>		precision	recall	f1-score	support	0	0.85	0.98	0.91	1057	1	0.98	0.82	0.89	1057	accuracy			0.90	2114	macro avg	0.91	0.90	0.90	2114	weighted avg	0.91	0.90	0.90	2114		0	1	0	1038	19	1	189	868
	precision	recall	f1-score	support																																																																												
0	0.87	0.95	0.91	1057																																																																												
1	0.95	0.86	0.90	1057																																																																												
accuracy			0.91	2114																																																																												
macro avg	0.91	0.91	0.91	2114																																																																												
weighted avg	0.91	0.91	0.91	2114																																																																												
	0	1																																																																														
0	1008	49																																																																														
1	145	912																																																																														
	precision	recall	f1-score	support																																																																												
0	0.85	0.98	0.91	1057																																																																												
1	0.98	0.82	0.89	1057																																																																												
accuracy			0.90	2114																																																																												
macro avg	0.91	0.90	0.90	2114																																																																												
weighted avg	0.91	0.90	0.90	2114																																																																												
	0	1																																																																														
0	1038	19																																																																														
1	189	868																																																																														