

Model Development Phase Template

Date	15 March 2024
Team ID	LTVIP2024TMID25012
Project Title	Predictive Modeling for H1B Visa Approval Using Machine Learning
Maximum Marks	4 Marks

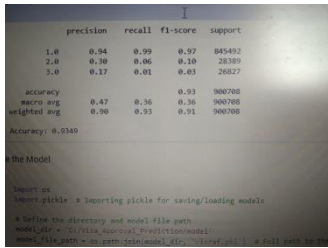
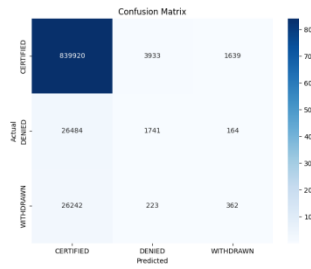
Initial Model Training Code, Model Validation and Evaluation Report

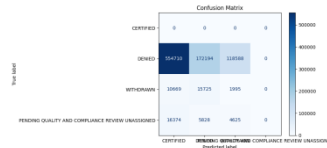
The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:

Paste the screenshot of the model training code

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix																
Model 1: Random Forest	 <pre> precision recall f1-score support 1.0 0.94 0.99 845402 2.0 0.38 0.86 26389 3.0 0.17 0.01 26027 accuracy: 0.47 macro avg: 0.36 0.36 0.90708 weighted avg: 0.30 0.93 0.91 900708 Accuracy: 0.9340 # The Model import os from pickle import dump # Importing pickle for saving/loading models # Define the directory and model file path model_dir = "C:\Data\Random_Forest\model1" model_filename = "random_forest_model.pkl" # Save the model with open(model_filename, "wb") as f: dump(model, f) </pre>	93	 <p>Confusion Matrix</p> <table border="1"> <thead> <tr> <th></th><th>CERTIFIED</th><th>DENIED Predicted</th><th>WITHDRAWN</th></tr> </thead> <tbody> <tr> <th>Actual CERTIFIED</th><td>839920</td><td>3933</td><td>1639</td></tr> <tr> <th>Actual DENIED</th><td>26484</td><td>1741</td><td>164</td></tr> <tr> <th>Actual WITHDRAWN</th><td>26242</td><td>223</td><td>362</td></tr> </tbody> </table>		CERTIFIED	DENIED Predicted	WITHDRAWN	Actual CERTIFIED	839920	3933	1639	Actual DENIED	26484	1741	164	Actual WITHDRAWN	26242	223	362
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Model 2:XGBoost	<table><tr><th></th><th>precision</th><th>recall</th><th>f1 score</th><th>support</th></tr><tr><td>CERTIFIED</td><td>0.90</td><td>0.90</td><td>0.90</td><td>0</td></tr><tr><td>DENIED</td><td>0.89</td><td>0.10</td><td>0.13</td><td>54545</td></tr><tr><td>WITHHELD</td><td>0.82</td><td>0.87</td><td>0.85</td><td>28385</td></tr><tr><td>PENDING QUALITY AND COMPLIANCE REVIEW UNCLASSIFIED</td><td>0.90</td><td>0.90</td><td>0.90</td><td>28827</td></tr><tr><td>accuracy</td><td colspan="4">0.19</td></tr><tr><td>macro avg</td><td>0.53</td><td>0.67</td><td>0.60</td><td>546782</td></tr><tr><td>weighted avg</td><td>0.57</td><td>0.19</td><td>0.11</td><td>546782</td></tr></table>		precision	recall	f1 score	support	CERTIFIED	0.90	0.90	0.90	0	DENIED	0.89	0.10	0.13	54545	WITHHELD	0.82	0.87	0.85	28385	PENDING QUALITY AND COMPLIANCE REVIEW UNCLASSIFIED	0.90	0.90	0.90	28827	accuracy	0.19				macro avg	0.53	0.67	0.60	546782	weighted avg	0.57	0.19	0.11	546782	20	<p>Confusion Matrix</p>  <table><tr><th></th><th>CERTIFIED</th><th>DENIED</th><th>WITHHELD</th><th>PENDING QUALITY AND COMPLIANCE REVIEW UNCLASSIFIED</th></tr><tr><th>CERTIFIED</th><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><th>DENIED</th><td>184734</td><td>173284</td><td>168988</td><td>0</td></tr><tr><th>WITHHELD</th><td>33065</td><td>37125</td><td>33000</td><td>0</td></tr><tr><th>PENDING QUALITY AND COMPLIANCE REVIEW UNCLASSIFIED</th><td>182274</td><td>16228</td><td>46725</td><td>0</td></tr></table>		CERTIFIED	DENIED	WITHHELD	PENDING QUALITY AND COMPLIANCE REVIEW UNCLASSIFIED	CERTIFIED	0	0	0	0	DENIED	184734	173284	168988	0	WITHHELD	33065	37125	33000	0	PENDING QUALITY AND COMPLIANCE REVIEW UNCLASSIFIED	182274	16228	46725	0
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