

## Model Development Phase Template

Date	10 July 2024
Team ID	739709
Project Title	To Predict Consumer Price Index
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:

```
from sklearn.ensemble import RandomForestRegressor
rfr=RandomForestRegressor()
rfr.fit(x_train,y_train)
```

▼ RandomForestRegressor  
RandomForestRegressor()

```
from sklearn.metrics import accuracy_score
```

```
from sklearn.linear_model import LinearRegression,Lasso
lr=LinearRegression()
```

```
lr.fit(x_train,y_train)
```

▼ LinearRegression  
LinearRegression()

#### Model Validation and Evaluation Report:

Model	Classification Report	F1 Score	Confusion Matrix
Random Forest	<a href="https://accounts.google.com/SignOutOptions?hl=en&amp;continue=https://colab.research.google.com/drive/15eWnRR2VMOhgmmCTe_Ytbr5AdP-E7Ssd%3Fusp%3Dsharing&amp;ec=GBRAqQM">https://accounts.google.com/SignOutOptions?hl=en&amp;continue=https://colab.research.google.com/drive/15eWnRR2VMOhgmmCTe_Ytbr5AdP-E7Ssd%3Fusp%3Dsharing&amp;ec=GBRAqQM</a> <pre>print(classification_report(y_test,ypred))</pre> <pre>               precision    recall  f1-score   support  Loan will be Approved      0.78      0.83      0.80         75 Loan will not be Approved  0.85      0.81      0.83         94     accuracy                   0.82         169   macro avg                   0.81         169  weighted avg                   0.82         169 </pre>	81%	<pre>confusion_matrix(y_test,ypred)</pre> <pre>array([[62, 13],        [18, 76]])</pre>

Decision Tree	<pre>print(classification_report(y_test,ypred))</pre> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>Loan will be Approved</td><td>0.73</td><td>0.83</td><td>0.77</td><td>75</td></tr><tr><td>Loan will not be Approved</td><td>0.85</td><td>0.76</td><td>0.80</td><td>94</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.79</td><td>169</td></tr><tr><td>macro avg</td><td>0.79</td><td>0.79</td><td>0.79</td><td>169</td></tr><tr><td>weighted avg</td><td>0.79</td><td>0.79</td><td>0.79</td><td>169</td></tr></tbody></table>		precision	recall	f1-score	support	Loan will be Approved	0.73	0.83	0.77	75	Loan will not be Approved	0.85	0.76	0.80	94	accuracy			0.79	169	macro avg	0.79	0.79	0.79	169	weighted avg	0.79	0.79	0.79	169	79%	<pre>confusion_matrix(y_test,ypred)</pre> <pre>array([[62, 13],        [23, 71]])</pre>
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KNN	<pre>print(classification_report(y_test,ypred))</pre> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>Loan will be Approved</td><td>0.60</td><td>0.57</td><td>0.59</td><td>75</td></tr><tr><td>Loan will not be Approved</td><td>0.67</td><td>0.69</td><td>0.68</td><td>94</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.64</td><td>169</td></tr><tr><td>macro avg</td><td>0.63</td><td>0.63</td><td>0.63</td><td>169</td></tr><tr><td>weighted avg</td><td>0.64</td><td>0.64</td><td>0.64</td><td>169</td></tr></tbody></table>		precision	recall	f1-score	support	Loan will be Approved	0.60	0.57	0.59	75	Loan will not be Approved	0.67	0.69	0.68	94	accuracy			0.64	169	macro avg	0.63	0.63	0.63	169	weighted avg	0.64	0.64	0.64	169	64%	<pre>confusion_matrix(y_test,ypred)</pre> <pre>array([[43, 32],        [29, 65]])</pre>
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Gradient Boosting	<pre>print(classification_report(y_test,ypred))</pre> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>Loan will be Approved</td><td>0.71</td><td>0.84</td><td>0.77</td><td>75</td></tr><tr><td>Loan will not be Approved</td><td>0.85</td><td>0.72</td><td>0.78</td><td>94</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.78</td><td>169</td></tr><tr><td>macro avg</td><td>0.78</td><td>0.78</td><td>0.77</td><td>169</td></tr><tr><td>weighted avg</td><td>0.79</td><td>0.78</td><td>0.78</td><td>169</td></tr></tbody></table>		precision	recall	f1-score	support	Loan will be Approved	0.71	0.84	0.77	75	Loan will not be Approved	0.85	0.72	0.78	94	accuracy			0.78	169	macro avg	0.78	0.78	0.77	169	weighted avg	0.79	0.78	0.78	169	78%	<pre>confusion_matrix(y_test,ypred)</pre> <pre>array([[63, 12],        [26, 68]])</pre>
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