Model Development Phase Template

Date	22 April 2024
Team ID	Team-738178
Project Title	Envisioning Success : Predicting University Scores With Machine Learning
Maximum Marks	4 Marks

Initial Model Training Code, Model Prediction and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model performance evaluation report will include Performance reports, Mean Squared Error, and Comparison between Actual and Predicted Values for multiple models, presented through respective screenshots.

Initial Model Training Code:

Linear Regression:

```
[77] linReg = LinearRegression()
     linReg.fit(X_train, y_train)
     y_pred_lr= linReg.predict(X_test)
```

Lasso Regression:

```
[78] lassoReg = linear_model.Lasso(alpha=0.1)
     lassoReg.fit(X, y)
     y_pred_lasso = lassoReg.predict(X_test)
```

Support Vector Regression(SVR):

```
[79] svr = SVR().fit(X, y)
     y_pred_svr=svr.predict(X_test)
```

Random Forest:

```
[81] rf = RandomForestRegressor(n_estimators=100, random_state=0)
     rf.fit(X, y)
     y_pred_rf = rf.predict(X_test)
```

Decision Tree:

```
[80] dt = DecisionTreeRegressor(random_state = 0)
     dt.fit(X, y)
     y_pred_dt = dt.predict(X_test)
```

Model Prediction and Evaluation Report:

Model	Performance Report	MSE	Comparison between Actual and Predicted Values
Lasso Regression	```# Printing results\nprint("Prediction Evaluation using Lasso Regression:")\nprint("MAE:", lasso_mae)\nprint("MSE:", lasso_mse)\nprint("RMSE:", lasso_rmse)\nprint("R-squared:", lasso_r2)\nprint("\n")\n\n\nPrediction Evaluation using Lasso Regression:\nMAE: 2.6604781238340274\nMSE: 28.893569757635724\nRMSE: 5.3752739239629195\nR-squared: 0.4635298370613741```	28.89	```# Printing actual and predicted values\nprint("Actual value:", y_actual)\nprint("Predicted value:", y_pred_lasso[0])\n\nActual value: 100\nPredicted value: 62.96954350809409```
Linear Regression	```# Printing results\nprint("Prediction Evaluation using Linear Regression:")\nprint("MAE:", lr_mae)\nprint("MSE:", lr_mse)\nprint("RMSE:", lr_rmse)\nprint("R-squared:", lr_r2)\nprint("\n")\n\n\nPrediction Evaluation using Linear Regression:\nMAE: 2.6657340636132827\nMSE: 28.917809410716295\nRMSE: 5.377528187812342\nR-squared: 0.4630797766933825```	28.92	```# Printing actual and predicted values\nprint("Actual value:", y_actual)\nprint("Predicted value:", y_pred_lr[0])\n\nActual value: 100\nPredicted value: [63.33166471]```
SVR	```# Printing results\nprint("Prediction Evaluation using SVR:")\nprint("MAE:", svr_mae)\nprint("MSE:", svr_mse)\nprint("RMSE:", svr_rmse)\nprint("R-squared:", svr_r2)\nprint("\n")\n\nPrediction Evaluation using SVR:\nMAE: 1.7292341972937126\nMSE: 26.883723937063873\nRMSE: 5.184951681266073\nR-squared: 0.50084687070893```	26.88	```# Printing actual and predicted values\nprint("Actual value:", y_actual)\nprint("Predicted value:", y_pred_svr[0])\n\nActual value: 100\nPredicted value: 60.02460149545989```
Random Forest	```# Printing results\nprint("Prediction Evaluation using Random Forest:")\nprint("MAE:", rf_mae)\nprint("MSE:", rf_mse)\nprint("RMSE:", rf_rmse)\nprint("R-squared:", rf_r2)\nprint("\n")\n\nPrediction Evaluation using Random Forest:\nMAE: 0.5947518939393951\nMSE: 1.6870365632197004\nRMSE: 1.2988597165281939\nR-squared: 0.9686766021801541```	1.69	```# Printing actual and predicted values\nprint("Actual value:", y_actual)\nprint("Predicted value:", y_pred_rf[0])\n\nActual value: 100\nPredicted value: 99.42905833333333```

| Decision Tree | ```
# Printing results
print("Prediction Evaluation using Decision Tree:")
print("MAE:", dt_mae)
print("MSE:", dt_mse)
print("RMSE:", dt_rmse)
print("R-squared:", dt_r2)

Prediction Evaluation using Decision Tree:
MAE: 0.7953636363636363
MSE: 3.165202727272727
RMSE: 1.7791016629953238
R-squared: 0.941231324579233
``` | 3.16 | ```
# Printing actual and predicted values
print("Actual value:", y_actual)
print("Predicted value:", y_pred_dt[0])

Actual value: 100
Predicted value: 100.0
``` |