Model Development Phase Template

Date	11 July 2024
Team ID	SWTID1720178802
Project Title	Garment worker productivity prediction
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:

```
linear_reg = LinearRegression()
linear_reg.fit(X_train, y_train)
linear_pred = linear_reg.predict(X_test)
linear_mse = mean_squared_error(y_test, linear_pred)
linear_mae = mean_absolute_error(y_test, linear_pred)
linear_r2 = r2_score(y_test, linear_pred)
```

```
rf_reg = RandomForestRegressor(random_state=42)
rf_reg.fit(X_train, y_train)
rf_pred = rf_reg.predict(X_test)
rf_mse = mean_squared_error(y_test, rf_pred)
rf_mae = mean_absolute_error(y_test, rf_pred)
rf_r2 = r2_score(y_test, rf_pred)
```

```
gb_reg = GradientBoostingRegressor(random_state=42)
gb_reg.fit(X_train, y_train)
gb_pred = gb_reg.predict(X_test)
gb_mse = mean_squared_error(y_test, gb_pred)
gb_mae = mean_absolute_error(y_test, gb_pred)
gb_r2 = r2_score(y_test, gb_pred)
```

```
xgb_reg = xgb.XGBRegressor(random_state=42)
xgb_reg.fit(X_train, y_train)
xgb_pred = xgb_reg.predict(X_test)
xgb_mse = mean_squared_error(y_test, xgb_pred)
xgb_mae = mean_absolute_error(y_test, xgb_pred)
xgb_r2 = r2_score(y_test, xgb_pred)
]
```

```
ridge_reg = Ridge(random_state=42)
ridge_reg.fit(X_train, y_train)
ridge_pred = ridge_reg.predict(X_test)
ridge_mse = mean_squared_error(y_test, ridge_pred)
ridge_mae = mean_absolute_error(y_test, ridge_pred)
ridge_r2 = r2_score(y_test, ridge_pred)
]
```

```
lasso_reg = Lasso(random_state=42)
lasso_reg.fit(X_train, y_train)
lasso_pred = lasso_reg.predict(X_test)
lasso_mse = mean_squared_error(y_test, lasso_pred)
lasso_mae = mean_absolute_error(y_test, lasso_pred)
lasso_r2 = r2_score(y_test, lasso_pred)
```

```python
models = {
    "Linear Regression": linear_reg,
    "Random Forest Regression": rf_reg,
    "Gradient Boosting Regression": gb_reg,
    "XGBoost Regression": xgb_reg,
    "Ridge Regression": ridge_reg,
    "Lasso Regression": lasso_reg
}
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy
Linear Regression	Linear Regression: Mean Squared Error: 0.014076030284090945 R2 Score: 0.25514084959589134	Mean Squared Error: 0.01407603 R2 Score: 0.255140
Random Forest Regression	Random Forest Regression: Mean Squared Error: 0.008564697959040876 R2 Score: 0.546783182723808	Mean Squared Error: 0.00856469 R2 Score: 0.546783
GradientBoostingRegressor	Gradient Boosting Regression: Mean Squared Error: 0.009747806494044426 R2 Score: 0.4841768085946899	Mean Squared Error: 0.009747806 R2 Score: 0.4841768
XGBRegressor	Ridge Regression: Mean Squared Error: 0.014047249739117938 R2 Score: 0.25666382531021537	Mean Squared Error: 0.00960215 R2 Score: 0.4918842
Ridge	Ridge Regression: Mean Squared Error: 0.014047249739117938 R2 Score: 0.25666382531021537	Mean Squared Error: 0.014047249

		R2 Score: 0.256663825
Lasso	Lasso Regression: Mean Squared Error: 0.019020639322314774 R2 Score: -0.006512273689480708	Mean Squared Error: 0.019020639 R2 Score: -0.00651227