

## Model Development Phase Template

Date	15 March 2024
Team ID	SWTID1720000747
Project Title	Detection Of Autistic Spectrum Disorder: Classification
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:

```
x_train,X_test,y_train,y_test = train_test_split(X,y,test_size=0.2,random_state=21)
```

```
lgr = LogisticRegression()
```

```
lgr.fit(X_train,y_train)
```

```
lgr.score(X_test,y_test)
```

```
accuracy_lr = lgr.score(X_test,y_test)*100
```

```
accuracy_lr
```

```
print(classification_report(y_true=y_test,y_pred=pred))
```

## SVC

```
svm = SVC(kernel = 'rbf', random_state=0)  
svm.fit(X_train, y_train)
```

```
▼ SVC ⓘ ?  
SVC(random_state=0)
```

```
svm.score(X_train, y_train)
```

```
0.997946611909651
```

```
svm.score(X_test, y_test)
```

```
0.9754098360655737
```

```
accuracy_SVM = svm.score(X_test, y_test)*100
```

```
accuracy_SVM
```

```
97.54098360655738
```

```
pred = svm.predict(X_test)
```

```
print(classification_report(y_true=y_test, y_pred=pred))
```

## KNN

```
In [73]: knn = KNeighborsClassifier(n_neighbors=5, metric = 'minkowski', p=2)
```

```
In [74]: knn.fit(X_train, y_train)
```

```
Out[74]: ▼ KNeighborsClassifier ⓘ ?  
KNeighborsClassifier()
```

```
In [75]: y_pred = knn.predict(X_test)
```

```
In [76]: accuracy_KNN = accuracy_score(y_test, y_pred)*100  
accuracy_KNN
```

```
Out[76]: 96.72131147540983
```

```
In [77]: print(classification_report(y_true=y_test, y_pred=y_pred))
```

```

rand_forest = RandomForestClassifier(random_state=42)

rand_forest.fit(X_train,y_train)

y_pred = rand_forest.predict(X_test)

accuracy_RF = rand_forest.score(X_test,y_pred)*100

accuracy_RF

print(classification_report(y_true=y_test,y_pred=y_pred))

from sklearn.metrics import f1_score
f1 = f1_score(y_test, y_pred)
f1

```

### Model Validation and Evaluation Report:

Model	Classification Report					Accuracy	Confusion Matrix
SVM	<hr/>					97.54%	[[87 0] [ 0 35]]
		precision	recall	f1-score	support		
	0	0.97	1.00	0.98	87		
	1	1.00	0.91	0.96	35		
	accuracy			0.98	122		
	macro avg	0.98	0.96	0.97	122		
	weighted avg	0.98	0.98	0.98	122		
KNN	<hr/>					96.72%	[[84 3] [ 1 34]]
		precision	recall	f1-score	support		
	0	0.99	0.97	0.98	87		
	1	0.92	0.97	0.94	35		
	accuracy			0.97	122		
	macro avg	0.95	0.97	0.96	122		
	weighted avg	0.97	0.97	0.97	122		

Logistic Regression	precision		recall	f1-score	support	98.3%	[[41 0] [ 1 19]]
	0	0.98	1.00	0.99	41		
	1	1.00	0.95	0.97	20		
	accuracy			0.98	61		
	macro avg		0.99	0.97	0.98	61	
	weighted avg		0.98	0.98	0.98	61	
Decision Trees	precision		recall	f1-score	support	95.3%	[[40 1] [ 1 19]]
	0	0.98	0.98	0.98	41		
	1	0.95	0.95	0.95	20		
	accuracy			0.97	61		
	macro avg		0.96	0.96	0.96	61	
	weighted avg		0.97	0.97	0.97	61	
Random Forest	precision		recall	f1-score	support	96.72%	[[40 1] [ 1 19]]
	0	0.98	0.98	0.98	41		
	1	0.95	0.95	0.95	20		
	accuracy			0.97	61		
	macro avg		0.96	0.96	0.96	61	
	weighted avg		0.97	0.97	0.97	61	