Instagram Influencer -- Classification

In [ ]:

```
from pycaret import *
```

In [2]:

```
import pandas as pd
col_val = ["Handle", "Followers", "Posts", "Avg_likes_per_post", "Avg_comments_per_post", "Engagement","Type"]
df = pd.read_csv("insta_data_label.csv", names=col_val)
```

In [3]:

```
df.head()
```

Out[3]:

	Handle	Followers	Posts	Avg_likes_per_post	Avg_comments_per_post	Engagement	Type
0	garethbale11	43742183	929	484288.5587	2757.180840	0.011134	Mega
1	m10_official	24031169	1476	383372.1179	3826.567073	0.016112	Mega
2	sergioramos	43910900	2016	604594.5050	3471.809028	0.013848	Mega
3	rohitsharma45	18395566	916	453322.0611	2182.572052	0.024762	Mega
4	hardikpandya93	17889094	1212	441048.0990	1886.547855	0.024760	Mega

In [4]:

```
from pycaret.classification import *
cls_algo=setup(data=df,target='Type',ignore_features = ['Handle'], normalize=True, session_id=1234)
```

	Description	Value
0	session_id	1234
1	Target	Type
2	Target Type	Multiclass
3	Label Encoded	Macro: 0, Mega: 1, Micro: 2, Mid-tier: 3
4	Original Data	(60, 7)
5	Missing Values	False

	Description	Value
6	Numeric Features	5
7	Categorical Features	0
8	Ordinal Features	False
9	High Cardinality Features	False
10	High Cardinality Method	None
11	Transformed Train Set	(41, 5)
12	Transformed Test Set	(19, 5)
13	Shuffle Train-Test	True
14	Stratify Train-Test	False
15	Fold Generator	StratifiedKFold
16	Fold Number	10
17	CPU Jobs	-1
18	Use GPU	False
19	Log Experiment	False
20	Experiment Name	clf-default-name
21	USI	7200
22	Imputation Type	simple
23	Iterative Imputation Iteration	None
24	Numeric Imputer	mean
25	Iterative Imputation Numeric Model	None
26	Categorical Imputer	constant
27	Iterative Imputation Categorical Model	None
28	Unknown Categoricals Handling	least_frequent
29	Normalize	True

	Description	Value
30	Normalize Method	zscore
31	Transformation	False
32	Transformation Method	None
33	PCA	False
34	PCA Method	None
35	PCA Components	None
36	Ignore Low Variance	False
37	Combine Rare Levels	False
38	Rare Level Threshold	None
39	Numeric Binning	False
40	Remove Outliers	False
41	Outliers Threshold	None
42	Remove Multicollinearity	False
43	Multicollinearity Threshold	None
44	Clustering	False
45	Clustering Iteration	None
46	Polynomial Features	False
47	Polynomial Degree	None
48	Trignometry Features	False
49	Polynomial Threshold	None
50	Group Features	False
51	Feature Selection	False
52	Feature Selection Method	classic
53	Features Selection Threshold	None

	Description	Value
54	Feature Interaction	False
55	Feature Ratio	False
56	Interaction Threshold	None
57	Fix Imbalance	False
58	Fix Imbalance Method	SMOTE

In [5]:

```
compare_models()
```

	Model	Accuracy	AUC	Recall	Prec.	F1	Kappa	MCC	TT (Sec)
rf	Random Forest Classifier	0.9250	0.9000	0.9125	0.9250	0.9167	0.9000	0.9191	0.1470
gbc	Gradient Boosting Classifier	0.9000	0.8750	0.8875	0.8875	0.8833	0.8667	0.8921	0.1320
et	Extra Trees Classifier	0.9000	0.9000	0.8875	0.8875	0.8833	0.8667	0.8921	0.1290
nb	Naive Bayes	0.8500	0.8792	0.8375	0.8125	0.8167	0.8000	0.8382	0.0150
dt	Decision Tree Classifier	0.8000	0.8167	0.8000	0.7375	0.7583	0.7333	0.7651	0.0150
qda	Quadratic Discriminant Analysis	0.7750	0.8417	0.7625	0.6958	0.7208	0.6939	0.7423	0.0150
ada	Ada Boost Classifier	0.7550	0.8217	0.7375	0.6750	0.6928	0.6706	0.7339	0.0580
knn	K Neighbors Classifier	0.6350	0.7825	0.6458	0.5667	0.5817	0.5049	0.5484	0.0270
svm	SVM - Linear Kernel	0.6300	0.0000	0.6375	0.5317	0.5550	0.5147	0.5837	0.0170
lr	Logistic Regression	0.6100	0.7800	0.6083	0.4817	0.5217	0.4617	0.5359	0.5550
ridge	Ridge Classifier	0.6100	0.0000	0.6083	0.4817	0.5217	0.4617	0.5359	0.0120
lda	Linear Discriminant Analysis	0.4850	0.7383	0.4750	0.3504	0.3900	0.3144	0.3699	0.0140
lightgbm	Light Gradient Boosting Machine	0.2900	0.4500	0.2583	0.0910	0.1362	0.0000	0.0000	0.0230

Out[5]:

```
RandomForestClassifier(bootstrap=True, ccp_alpha=0.0, class_weight=None,
                       criterion='gini', max_depth=None, max_features='auto',
                       max_leaf_nodes=None, max_samples=None,
                       min_impurity_decrease=0.0, min_impurity_split=None,
                       min_samples_leaf=1, min_samples_split=2,
                       min_weight_fraction_leaf=0.0, n_estimators=100,
                       n_jobs=-1, oob_score=False, random_state=1234, verbose=0,
                       warm_start=False)
```

In [6]:

```
model_rf= create_model('rf')
```

	Accuracy	AUC	Recall	Prec.	F1	Kappa	MCC
0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1	0.7500	1.0000	0.7500	0.6250	0.6667	0.6667	0.7303
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	0.7500	1.0000	0.7500	0.6250	0.6667	0.6667	0.7303
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9	0.7500	0.0000	0.6250	1.0000	0.8333	0.6667	0.7303
Mean	0.9250	0.9000	0.9125	0.9250	0.9167	0.9000	0.9191
SD	0.1146	0.3000	0.1375	0.1500	0.1344	0.1528	0.1236

In [7]:

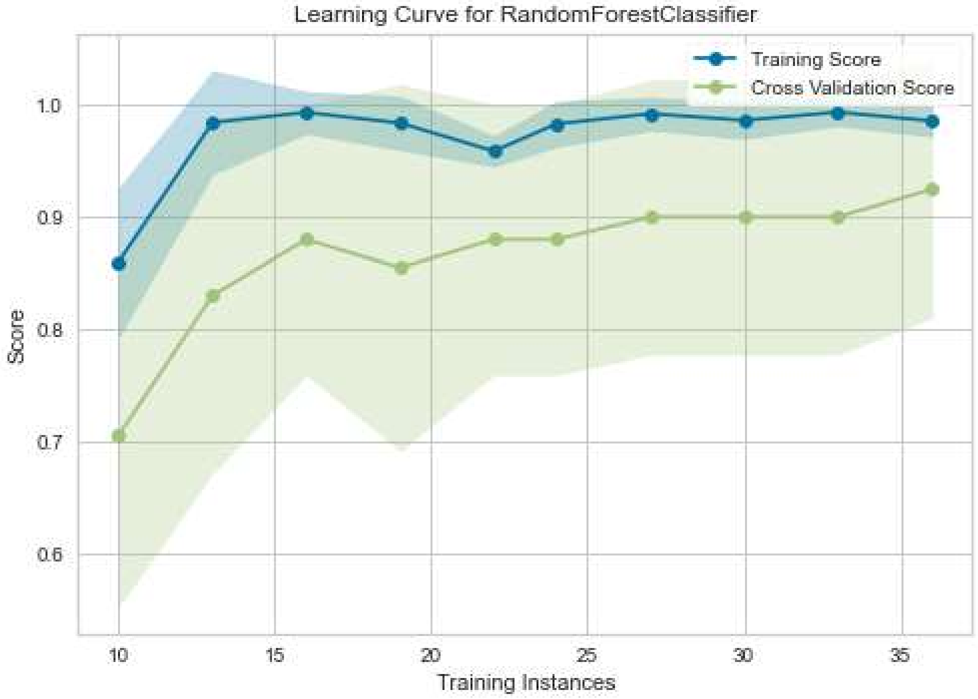
```
tuned_model_rf = tune_model(model_rf)
```

	Accuracy	AUC	Recall	Prec.	F1	Kappa	MCC
0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1	0.7500	1.0000	0.7500	0.6250	0.6667	0.6667	0.7303
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

	Accuracy	AUC	Recall	Prec.	F1	Kappa	MCC
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
8	0.7500	1.0000	0.7500	0.6250	0.6667	0.6667	0.7303
9	0.7500	0.0000	0.6250	1.0000	0.8333	0.6667	0.7303
Mean	0.9250	0.9000	0.9125	0.9250	0.9167	0.9000	0.9191
SD	0.1146	0.3000	0.1375	0.1500	0.1344	0.1528	0.1236

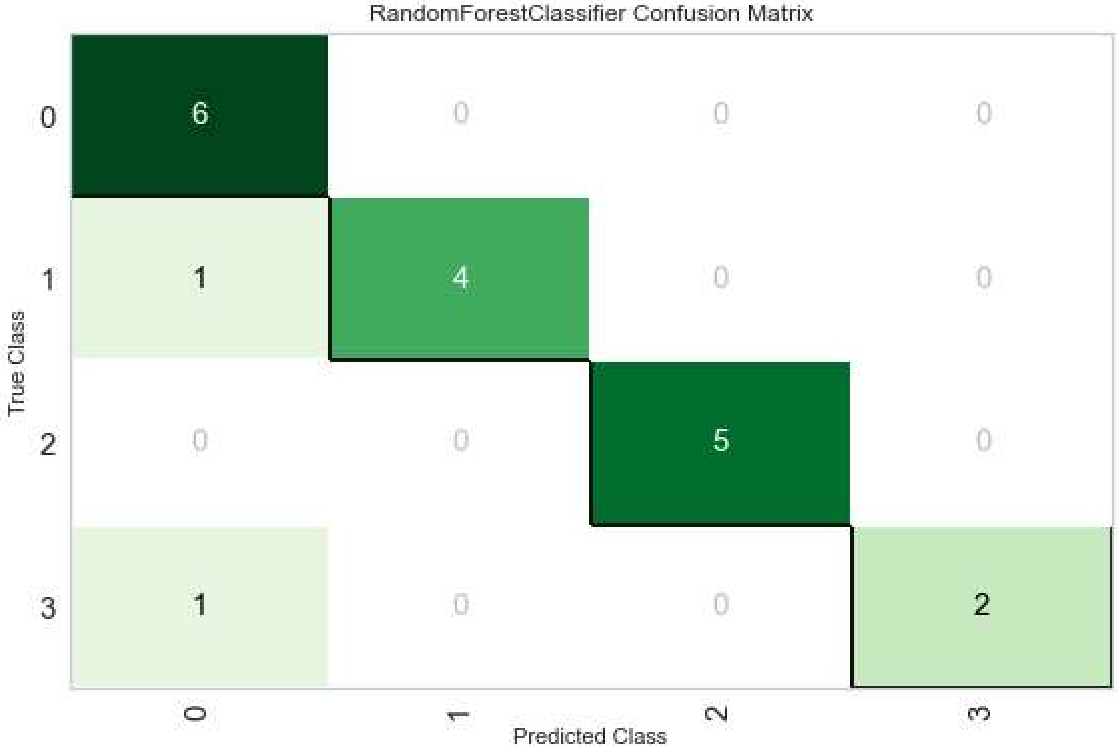
In [8]:

```
plot_model(estimator = tuned_model_rf, plot = 'learning')
```



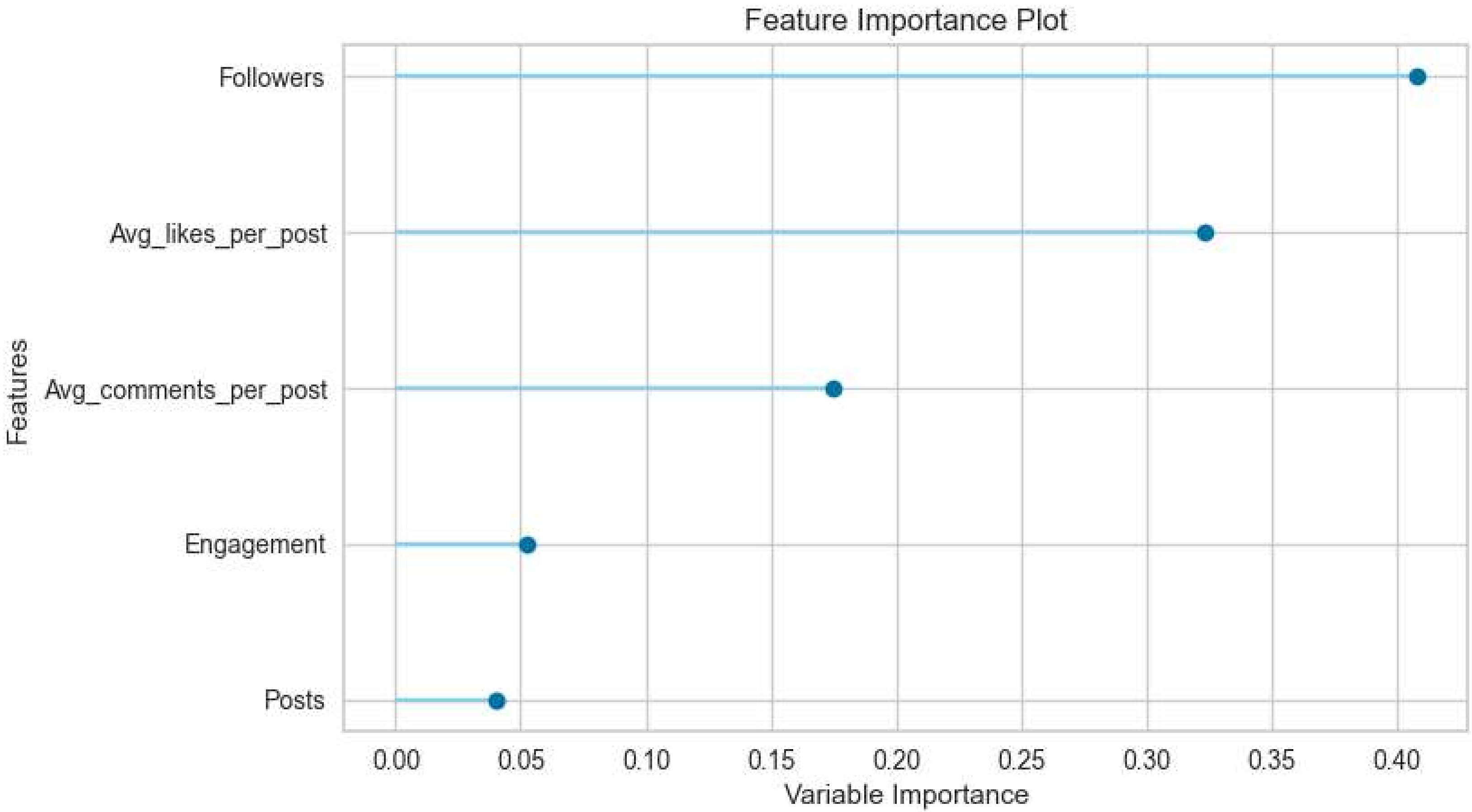
In [9]:

```
plot_model(estimator = tuned_model_rf, plot = 'confusion_matrix')
```



In [10]:

```
plot_model(estimator = tuned_model_rf, plot = 'feature')
```



In [11]:

```
predictions = predict_model(tuned_model_rf, data=df)
predictions.head()
```

Out[11]:

	Handle	Followers	Posts	Avg_likes_per_post	Avg_comments_per_post	Engagement	Type	Label	Score
0	garethbale11	43742183	929	484288.5587	2757.180840	0.011134	Mega	Mega	0.9201
1	m10_official	24031169	1476	383372.1179	3826.567073	0.016112	Mega	Mega	0.9798
2	sergioramos	43910900	2016	604594.5050	3471.809028	0.013848	Mega	Mega	0.9879
3	rohitsharma45	18395566	916	453322.0611	2182.572052	0.024762	Mega	Mega	0.9144
4	hardikpandya93	17889094	1212	441048.0990	1886.547855	0.024760	Mega	Mega	0.9244

In [12]:

```
tuned_model_rf
```

Out[12]:

```
RandomForestClassifier(bootstrap=True, ccp_alpha=0.0, class_weight='balanced',
                       criterion='entropy', max_depth=4, max_features='sqrt',
                       max_leaf_nodes=None, max_samples=None,
                       min_impurity_decrease=0.01, min_impurity_split=None,
                       min_samples_leaf=3, min_samples_split=5,
                       min_weight_fraction_leaf=0.0, n_estimators=120,
                       n_jobs=-1, oob_score=False, random_state=1234, verbose=0,
                       warm_start=False)
```

In [13]:

```
save_model(tuned_model_rf, 'Influencer_prediction_rf')
```

```
Transformation Pipeline and Model Succesfully Saved
```

Out[13]:

```
(Pipeline(memory=None,
          steps=[('dtypes',
                  DataTypes_Auto_infer(categorical_features=[],
                                       display_types=True,
                                       features_todrop=['Handle'], id_columns=[],
                                       ml_usecase='classification',
                                       numerical_features=[], target='Type',
                                       time_features=[])),
                 ('imputer',
                  Simple_Imputer(categorical_strategy='not_available',
                                 fill_value_categorical=None,
                                 fill_value_numerical=None,
                                 numeric...
                  RandomForestClassifier(bootstrap=True, ccp_alpha=0.0,
                                         class_weight='balanced',
                                         criterion='entropy', max_depth=4,
                                         max_features='sqrt',
                                         max_leaf_nodes=None, max_samples=None,
                                         min_impurity_decrease=0.01,
                                         min_impurity_split=None,
                                         min_samples_leaf=3, min_samples_split=5,
                                         min_weight_fraction_leaf=0.0,
                                         n_estimators=120, n_jobs=-1,
                                         oob_score=False, random_state=1234,
                                         verbose=0, warm_start=False)]],
          verbose=False),
 'Influencer_prediction_rf.pkl')
```