

Model Optimization: VRM/TPRM Program Data

Increasing the number of independent (X) variables to improve the accuracy of a model:

$$\text{Model Accuracy} = [(True +ve) + (True -ve)] / [(True +ve) + (True -ve) + (False +ve) + (False -ve)]$$

```
Index(['Vendor', 'Service Type', 'Contract ID', 'Strategic Risk',  
      'Legal and Regulatory Compliance', 'Financial Risk', 'Reputational',  
      'Information Security', 'Information Technology', 'Physical Security',  
      'Insurance Coverage', 'Service Risk Score', 'Service Risk Rating',  
      'Normalized Score', 'Reassessment Status'],  
      dtype='object')
```

Accuracy Score 76.0

```
1 from sklearn.metrics import confusion_matrix  
2 confusion_matrix(y_test, predictions)
```

```
array([[11,  1],  
       [ 5,  8]], dtype=int64)
```

```
1 from sklearn.metrics import classification_report  
2 print(classification_report(y_test, predictions))
```

	precision	recall	f1-score	support
No	0.69	0.92	0.79	12
Yes	0.89	0.62	0.73	13
accuracy			0.76	25
macro avg	0.79	0.77	0.76	25
weighted avg	0.79	0.76	0.76	25

```
Index(['Vendor', 'Service Type', 'Contract ID', 'Strategic Risk',  
      'Legal and Regulatory Compliance', 'Financial Risk', 'Reputational',  
      'Information Security', 'Information Technology', 'Physical Security',  
      'Insurance Coverage', 'Service Risk Score', 'Service Risk Rating',  
      'Reassessment Status', 'Reassessment Factor', 'KPI Factor',  
      'Alternate Vendor Factor', 'Contract-KPI Compliance Factor',  
      'Regulatory Findings Factor', 'Audit Factor', 'Assessment Factor',  
      'Revised Service Risk Score', 'Normalized Service Risk Score',  
      'Revised Service Risk Rating', 'Enhanced Monitoring'],  
      dtype='object')
```

Accuracy Score 96.0

```
from sklearn.metrics import confusion_matrix  
confusion_matrix(y_test, predictions)
```

```
array([[21,  1],  
       [ 0,  3]], dtype=int64)
```

```
from sklearn.metrics import classification_report  
print(classification_report(y_test, predictions))
```

	precision	recall	f1-score	support
No	1.00	0.95	0.98	22
Yes	0.75	1.00	0.86	3
accuracy			0.96	25
macro avg	0.88	0.98	0.92	25
weighted avg	0.97	0.96	0.96	25