Vamos experimentar agora o algoritmo Decision Tree?

```
!pip -q install yellowbrick
```

```
[notice] A new release of pip available: 22.3 -> 23.0.1
[notice] To update, run: python.exe -m pip install --upgrade pip
```

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.express as px
from sklearn.tree import DecisionTreeClassifier
```

```
import pickle
with open('restaurante.pkl', 'rb') as f:
  X_treino, X_teste, y_treino, y_teste = pickle.load(f)
```

```
modelo = DecisionTreeClassifier(criterion='entropy')
modelo.fit(X_treino, y_treino)
```

```
DecisionTreeClassifier(criterion='entropy')
```

Vamos testar o modelo?

```
previsoes = modelo.predict(X_teste)
```

```
previsoes
```

```
array(['Nao', 'Nao', 'Nao'], dtype=object)
```

Será se o modelo acertou?

```
y_teste
```

```
array(['Nao', 'Sim', 'Nao'], dtype=object)
```

```
from sklearn.metrics import accuracy_score, confusion_matrix,
classification_report
accuracy_score(y_teste,previsoes)
```

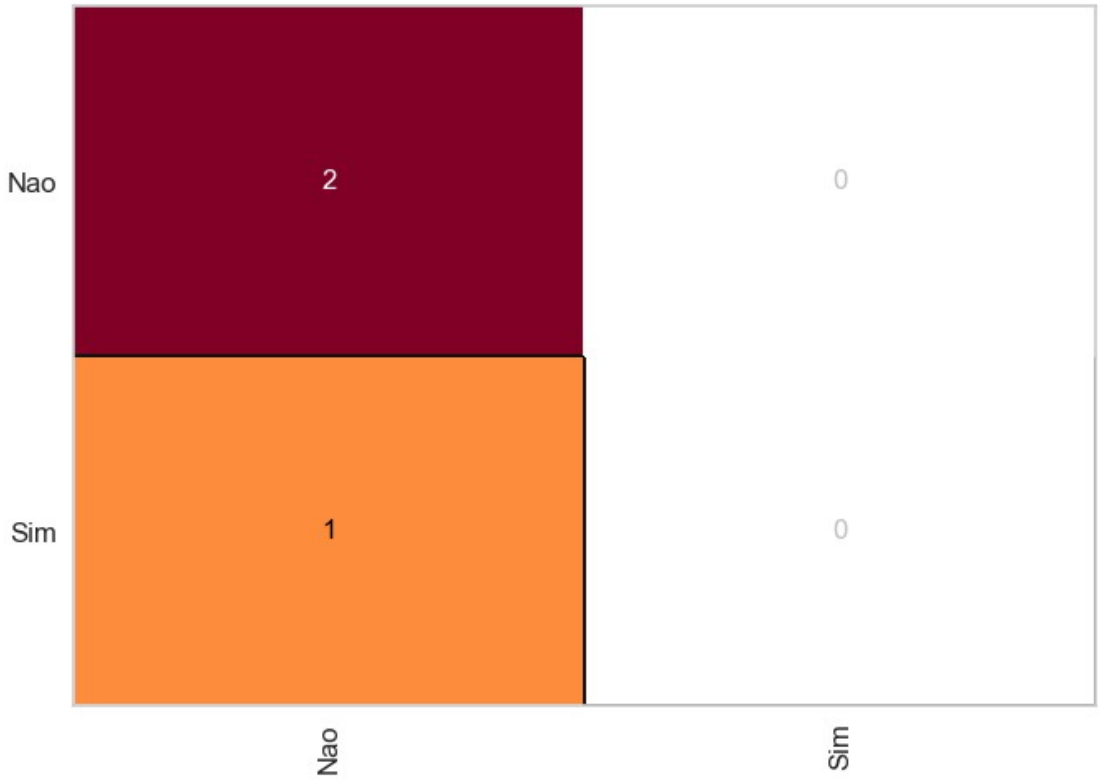
```
0.6666666666666666
```

```
from yellowbrick.classifier import ConfusionMatrix
confusion_matrix(y_teste, previsoes)
```

```
array([[2, 0],
       [1, 0]], dtype=int64)
```

```
cm = ConfusionMatrix(modelo)
cm.fit(X_treino, y_treino)
cm.score(X_teste, y_teste)
```

```
0.6666666666666666
```




```
print(classification_report(y_teste, previsoes))
```

```
              precision    recall  f1-score   support

         Nao       0.67      1.00      0.80         2
         Sim       0.00      0.00      0.00         1

    accuracy                           0.67         3
   macro avg       0.33      0.50      0.40         3
weighted avg       0.44      0.67      0.53         3


c:\Python311\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Precision and F-score
are ill-defined and being set to 0.0 in labels with no predicted
samples. Use `zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
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```
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```

```
from sklearn import tree
previsores = ['Alternativo', 'Bar', 'Sex/Sab', 'Fome',
'ClienteAlguns', 'ClienteCheio',
              'ClienteNenhum', 'PrecoRRR', 'PrecoR', 'PrecoRR',
'Chuva', 'Res',
              'TipoFrances', 'TipoTailandes', 'TipoHamburger',
'TipoItaliano',
              'Tempo0-10', 'Tempo30-60', 'TempoOut/30', 'Tempo>60']
figura, eixos = plt.subplots(nrows=1, ncols=1, figsize=(10,10))
tree.plot_tree(modelo, feature_names=previsores, class_names =
modelo.classes_, filled=True);
```