In [ ]:
```
from sklearn.datasets import load_iris
from sklearn import tree
import pandas as pd
import matplotlib.pyplot as plt
```

In [ ]:
```
madelon_train_data = pd.read_table('D:\PythonS\DataSets\FSU Applied Machine Learning D
```

In [ ]:
```
madelon_train_labels = pd.read_table('D:\PythonS\DataSets\FSU Applied Machine Learning
```

In [ ]:
```
X, y = madelon_train_data, madelon_train_labels
```

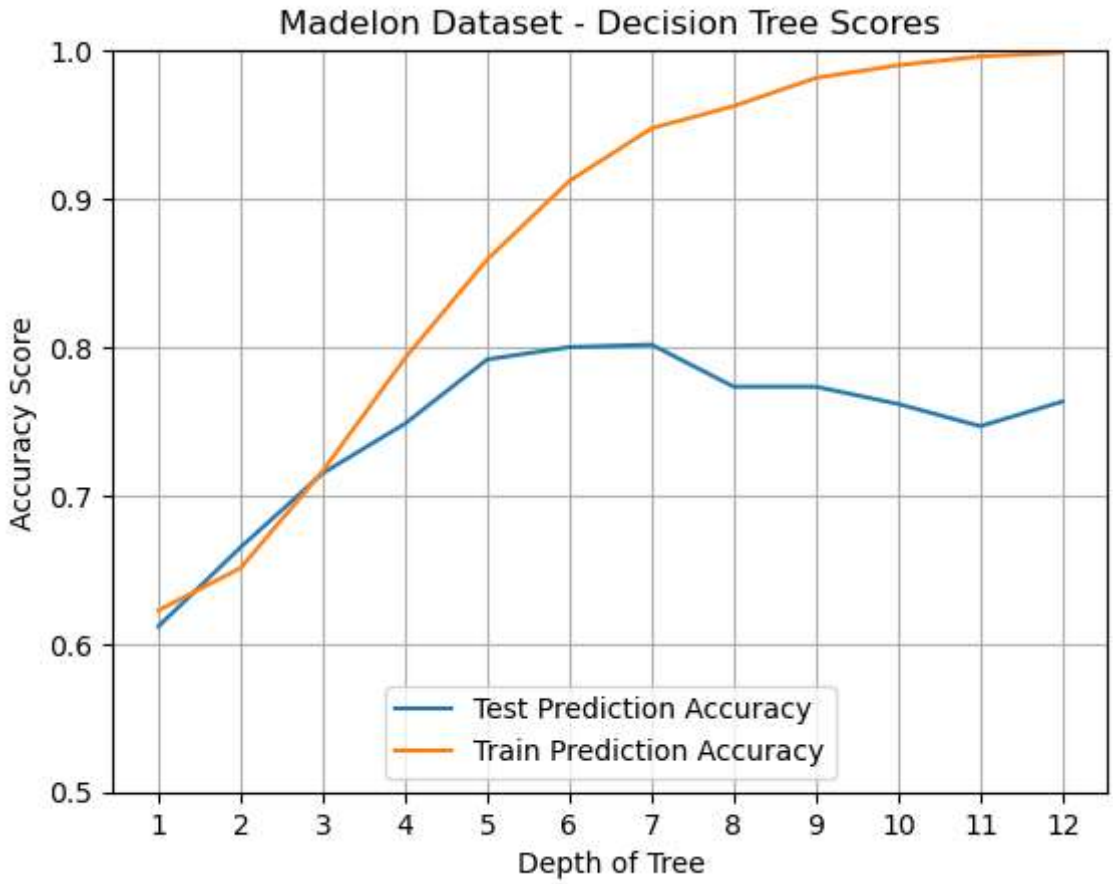
In [ ]:
```
trees = []
for i in range(1,13):
    trees.append(tree.DecisionTreeClassifier(max_depth=i, random_state = i).fit(X,y))
```

In [ ]:
```
vdata = pd.read_table('D:\PythonS\DataSets\FSU Applied Machine Learning DS\MADELON\mad
```

In [ ]:
```
vlabel = pd.read_table('D:\PythonS\DataSets\FSU Applied Machine Learning DS\MADELON\ma
```

In [ ]:
```
scores_train = []
scores_valid = []
for t in trees:
    scores_train.append(t.score(X,y))
    scores_valid.append(t.score(vdata, vlabel))
```

In [ ]:
```
plt.title('Madelon Dataset - Decision Tree Scores')
plt.plot(range(1,13), scores_valid, label = 'Test Prediction Accuracy')
plt.plot(range(1,13), scores_train, label = 'Train Prediction Accuracy')
plt.ylim(0.5,1)
plt.xlabel('Depth of Tree')
plt.ylabel('Accuracy Score')
plt.legend(loc = 'lower center')
plt.xticks(range(1,13))
plt.yticks()
plt.grid()
plt.show()
```



In [ ]:
```
print(1 - scores_valid[6])
```

```
0.19833333333333336
```

In [ ]: