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In [1]:
```
import numpy as np
import pandas as pd
import seaborn as sns
from sklearn.model_selection import train_test_split
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

Decision Tree

In [2]:
```
read=pd.read_csv("Social_Network_Ads.csv")
```

In [3]:
```
read.head()
```

Out[3]:

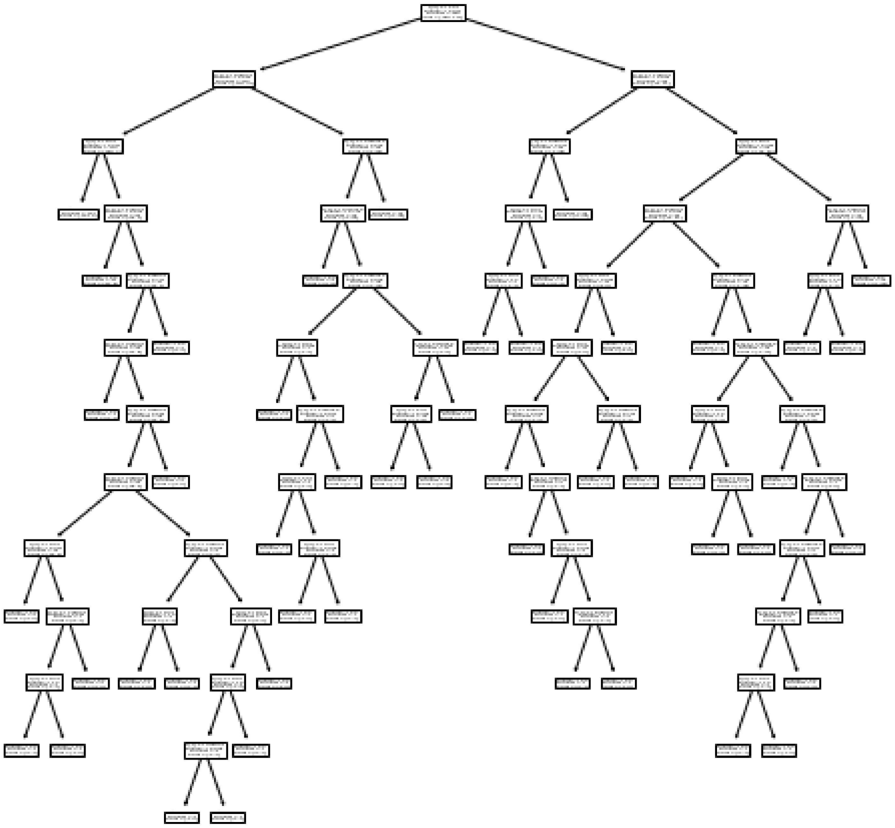
	User ID	Gender	Age	EstimatedSalary	Purchased
0	15624510	Male	19	19000	0
1	15810944	Male	35	20000	0
2	15668575	Female	26	43000	0
3	15603246	Female	27	57000	0
4	15804002	Male	19	76000	0

In [4]:
```
x=read.iloc[:,[2,3]]
y=read.iloc[:,-1]
```

In [5]:
```
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest=train_test_split(x,y,test_size=1/4,random_state=0)
```

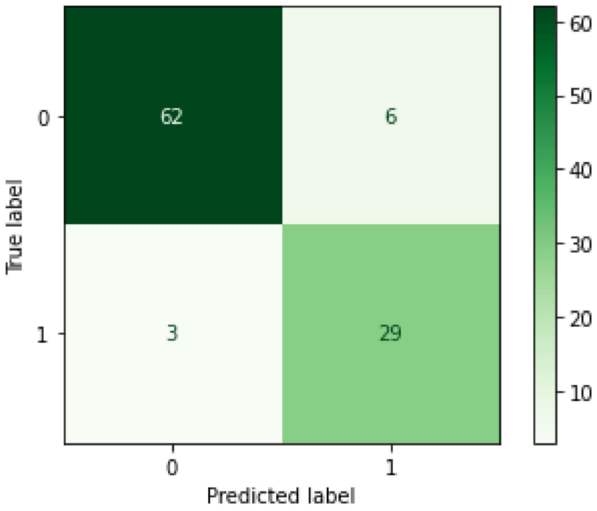
In [6]:
```
from sklearn.tree import DecisionTreeClassifier,export_graphviz,plot_tree
classifier=DecisionTreeClassifier(criterion="entropy",random_state=0)
classifier = classifier.fit(xtrain,ytrain)
ypred=classifier.predict(xtest)
```

In [7]:
```
plt.figure(figsize=(8,8))
plot_tree(classifier)
plt.show()
```



In [8]:

```
from sklearn.metrics import plot_confusion_matrix,accuracy_score
plot_confusion_matrix(classifier,xtest,ytest,cmap="Greens")
plt.show()
```



In [9]:

```
accuracy_score(ytest,ypred)
```

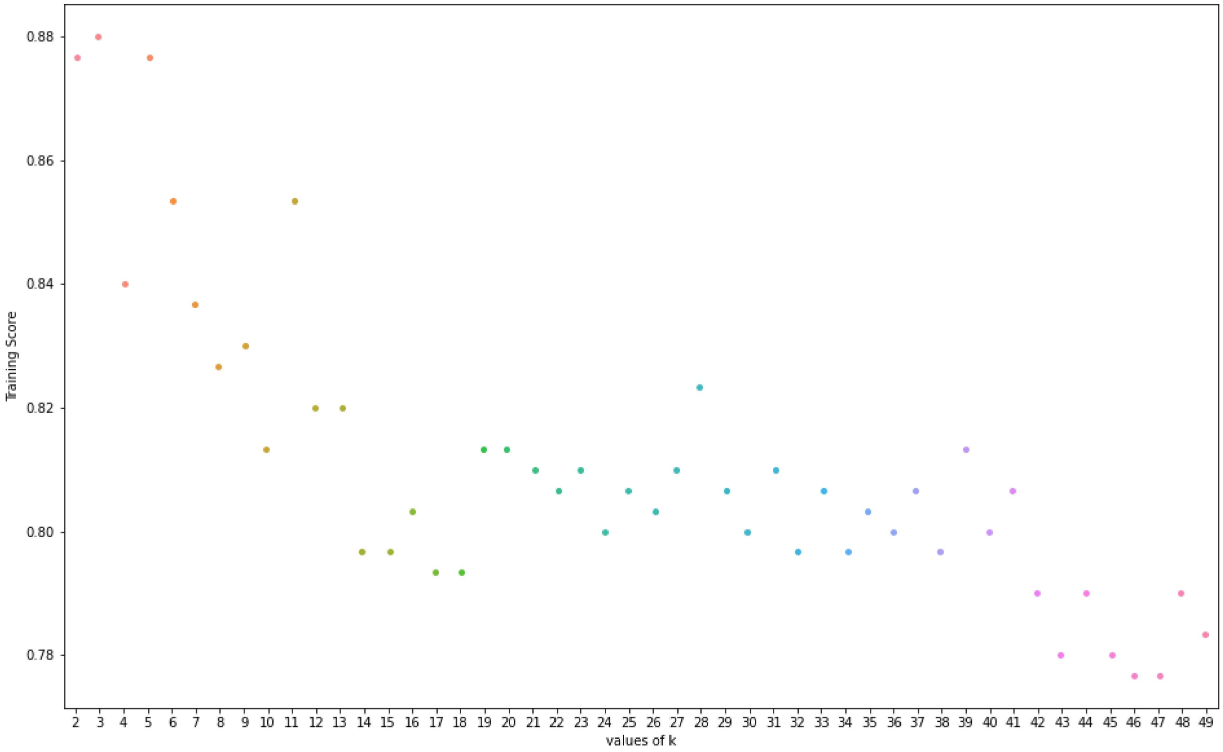
Out[9]:

```
0.91
```

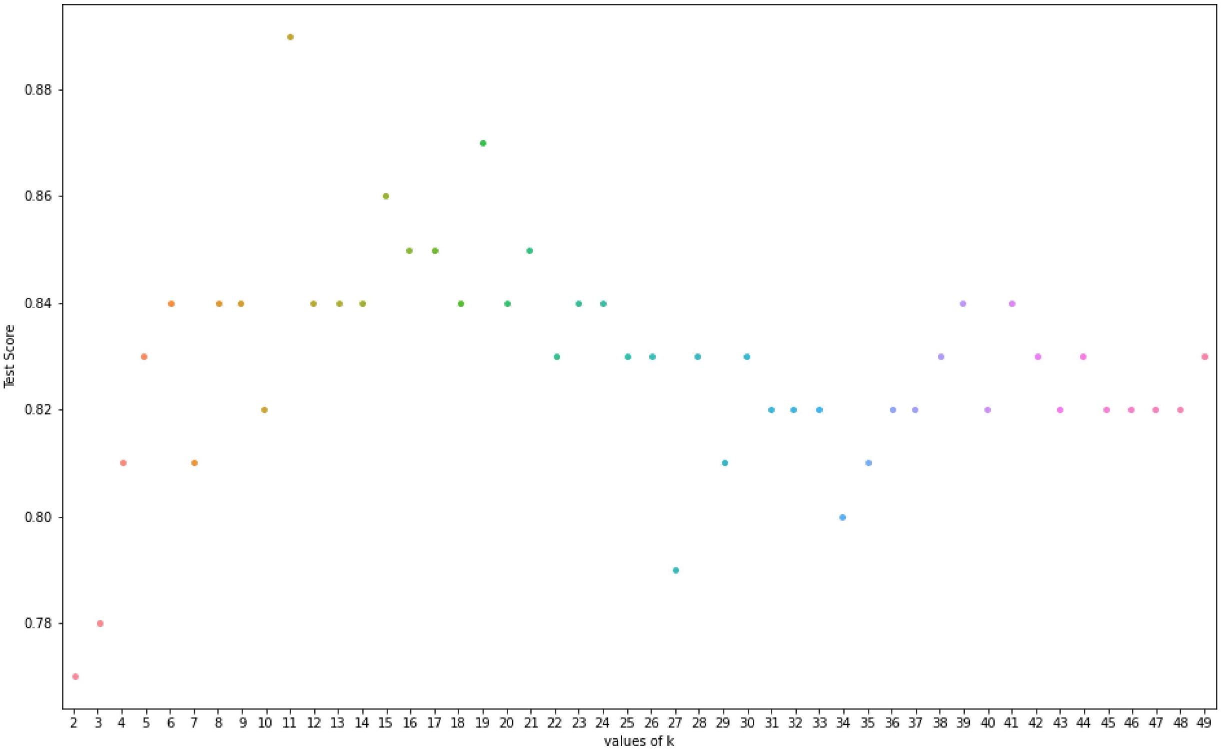
KNN

In [10]:

```python
from sklearn.neighbors import KNeighborsClassifier
K = []
training = []
test = []
scores = {}

for k in range(2, 50):
    clf = KNeighborsClassifier(n_neighbors = k)
    clf.fit(xtrain, ytrain)

    training_score = clf.score(xtrain, ytrain)
    test_score = clf.score(xtest, ytest)
    K.append(k)

    training.append(training_score)
    test.append(test_score)
    scores[k] = [training_score, test_score]
plt.figure(figsize=(16,10))
ax = sns.stripplot(K, training);
ax.set(xlabel ='values of k', ylabel ='Training Score')
plt.show()
```

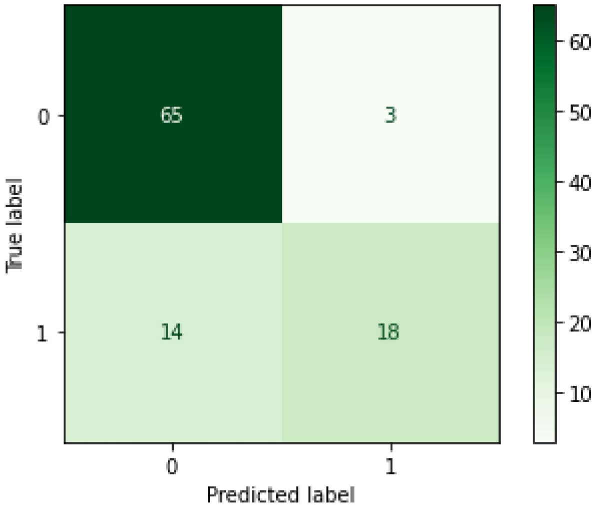


In [11]:
```
plt.figure(figsize=(16,10))
ax = sns.stripplot(K, test);
ax.set(xlabel ='values of k', ylabel ='Test Score')
plt.show()
```



In [12]:
```
ypredict = clf.predict(xtest)
```

In [13]:
```
from sklearn.metrics import plot_confusion_matrix,accuracy_score
plot_confusion_matrix(clf,xtest,ytest,cmap="Greens",)
plt.show()
```



In [14]:
```
accuracy_score(ytest,ypredict)
```

Out[14]:
```
0.83
```