In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
df=pd.read_csv(r"C:\Users\user\Downloads\C10_loan1.csv")
df
```

Out[2]:

	Home Owner	Marital Status	Annual Income	Defaulted Borrower
0	Yes	Single	125	No
1	No	Married	100	No
2	No	Single	70	No
3	Yes	Married	120	No
4	No	Divorced	95	Yes
5	No	Married	60	No
6	Yes	Divorced	220	No
7	No	Single	85	Yes
8	No	Married	75	No
9	No	Single	90	Yes

In [3]:
```
ge=df[['Annual Income','Defaulted Borrower']]
```

In [4]:
```
d=ge.fillna(20)
```

In [5]:
```
ge['Defaulted Borrower'].value_counts()
```

Out[5]:
```
No     7
Yes    3
Name: Defaulted Borrower, dtype: int64
```

In [ ]:
```

```

In [7]:
```
x=ge.drop('Defaulted Borrower',axis=1)
y=ge['Defaulted Borrower']
```

In [ ]:
```

```

In [8]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,train_size=0.70)
```

In [9]:
```
from sklearn.ensemble import RandomForestClassifier
rfc=RandomForestClassifier()
rfc.fit(x_train,y_train)
```

Out[9]:
```
RandomForestClassifier()
```

In [10]:
```
paramets = {'max_depth':[1,2,3,4,5],
              'min_samples_leaf':[5,10,15,20,25],
              'n_estimators':[10,20,30,40,50]}
```

In [11]:
```
from sklearn.model_selection import GridSearchCV
grid_search= GridSearchCV(estimator = rfc,param_grid=paramets,cv=2,scoring="acc
grid_search.fit(x_train,y_train)
```

Out[11]:
```
GridSearchCV(cv=2, estimator=RandomForestClassifier(),
             param_grid={'max_depth': [1, 2, 3, 4, 5],
                         'min_samples_leaf': [5, 10, 15, 20, 25],
                         'n_estimators': [10, 20, 30, 40, 50]},
             scoring='accuracy')
```

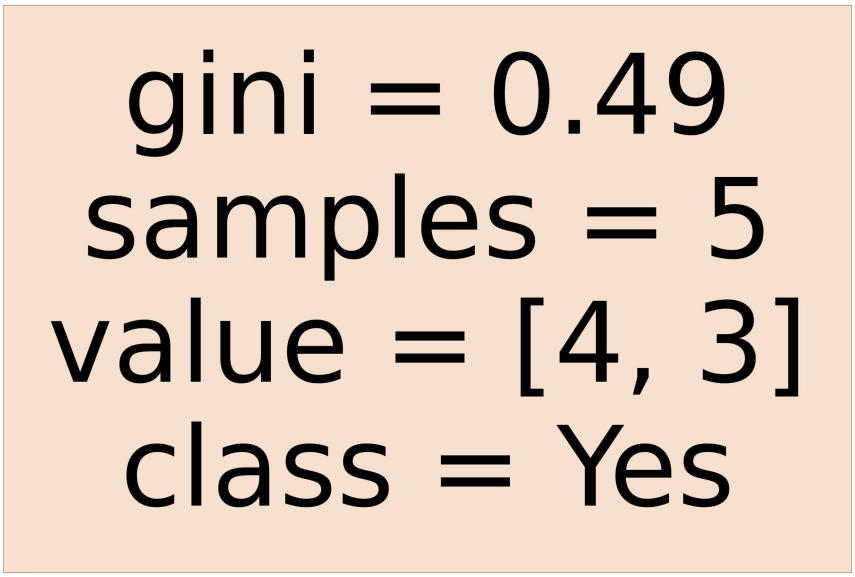
In [12]:
```
grid_search.best_score_
```

Out[12]:
```
0.7083333333333333
```

In [13]:
```
rfc_best=grid_search.best_estimator_
```

In [14]:
```
from sklearn.tree import plot_tree
plt.figure(figsize=(80,40))
plot_tree(rfc_best.estimators_[5],feature_names=x.columns,class_names=['Yes','N
```

Out[14]:
```
[Text(2232.0, 1087.2, 'gini = 0.49\nsamples = 5\nvalue = [4, 3]\nclass = Ye
s')]
```



In [ ]: