In [35]:
```
#importing Libraries
import pandas as pd
import numpy as np
import seaborn as sns
```

In [36]:
```
data = pd.read_csv('Admission_Predict.csv')
data
```

Out[36]:

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
0	1	337	118	4	4.5	4.5	9.65	1	0.92
1	2	324	107	4	4.0	4.5	8.87	1	0.76
2	3	316	104	3	3.0	3.5	8.00	1	0.72
3	4	322	110	3	3.5	2.5	8.67	1	0.80
4	5	314	103	2	2.0	3.0	8.21	0	0.65
...	...	...	...	...	...	...	...	...	...
395	396	324	110	3	3.5	3.5	9.04	1	0.82
396	397	325	107	3	3.0	3.5	9.11	1	0.84
397	398	330	116	4	5.0	4.5	9.45	1	0.91
398	399	312	103	3	3.5	4.0	8.78	0	0.67
399	400	333	117	4	5.0	4.0	9.66	1	0.95

400 rows × 9 columns

In [37]:
```
data.columns
```

Out[37]:
```
Index(['Serial No.', 'GRE Score', 'TOEFL Score', 'University Rating', 'SOP',
       'LOR ', 'CGPA', 'Research', 'Chance of Admit '],
      dtype='object')
```

In [38]:
```
data.dtypes
```

Out[38]:
```
Serial No.             int64
GRE Score              int64
TOEFL Score            int64
University Rating      int64
SOP                  float64
LOR                  float64
CGPA                 float64
Research               int64
Chance of Admit      float64
dtype: object
```

In [39]:
```
data.shape
```

Out[39]:
```
(400, 9)
```

In [40]:
```
data.isna().sum()
```

Out[40]:
```
Serial No.           0
GRE Score            0
TOEFL Score          0
University Rating    0
SOP                  0
LOR                  0
CGPA                 0
Research             0
Chance of Admit      0
dtype: int64
```

In [41]:
```
data.head()
```

Out[41]:

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
0	1	337	118	4	4.5	4.5	9.65	1	0.92
1	2	324	107	4	4.0	4.5	8.87	1	0.76
2	3	316	104	3	3.0	3.5	8.00	1	0.72
3	4	322	110	3	3.5	2.5	8.67	1	0.80
4	5	314	103	2	2.0	3.0	8.21	0	0.65

In [42]:
```
#if Chance of Admit >= 0.75 ===> 1 else 0
from sklearn.preprocessing import Binarizer
bi = Binarizer(threshold=0.75)
data['Chance of Admit '] = bi.fit_transform(data[['Chance of Admit ']])
```

In [43]:
```
data.head()
```

Out[43]:

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
0	1	337	118	4	4.5	4.5	9.65	1	1.0
1	2	324	107	4	4.0	4.5	8.87	1	1.0
2	3	316	104	3	3.0	3.5	8.00	1	0.0
3	4	322	110	3	3.5	2.5	8.67	1	1.0
4	5	314	103	2	2.0	3.0	8.21	0	0.0

In [44]:
```
x = data.drop('Chance of Admit ', axis = 1)
y = data['Chance of Admit ']
```

In [45]:
```
x
```

Out[45]:

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research
0	1	337	118	4	4.5	4.5	9.65	1
1	2	324	107	4	4.0	4.5	8.87	1
2	3	316	104	3	3.0	3.5	8.00	1
3	4	322	110	3	3.5	2.5	8.67	1
4	5	314	103	2	2.0	3.0	8.21	0
...	...	...	...	...	...	...	...	...
395	396	324	110	3	3.5	3.5	9.04	1
396	397	325	107	3	3.0	3.5	9.11	1
397	398	330	116	4	5.0	4.5	9.45	1
398	399	312	103	3	3.5	4.0	8.78	0
399	400	333	117	4	5.0	4.0	9.66	1

400 rows × 8 columns

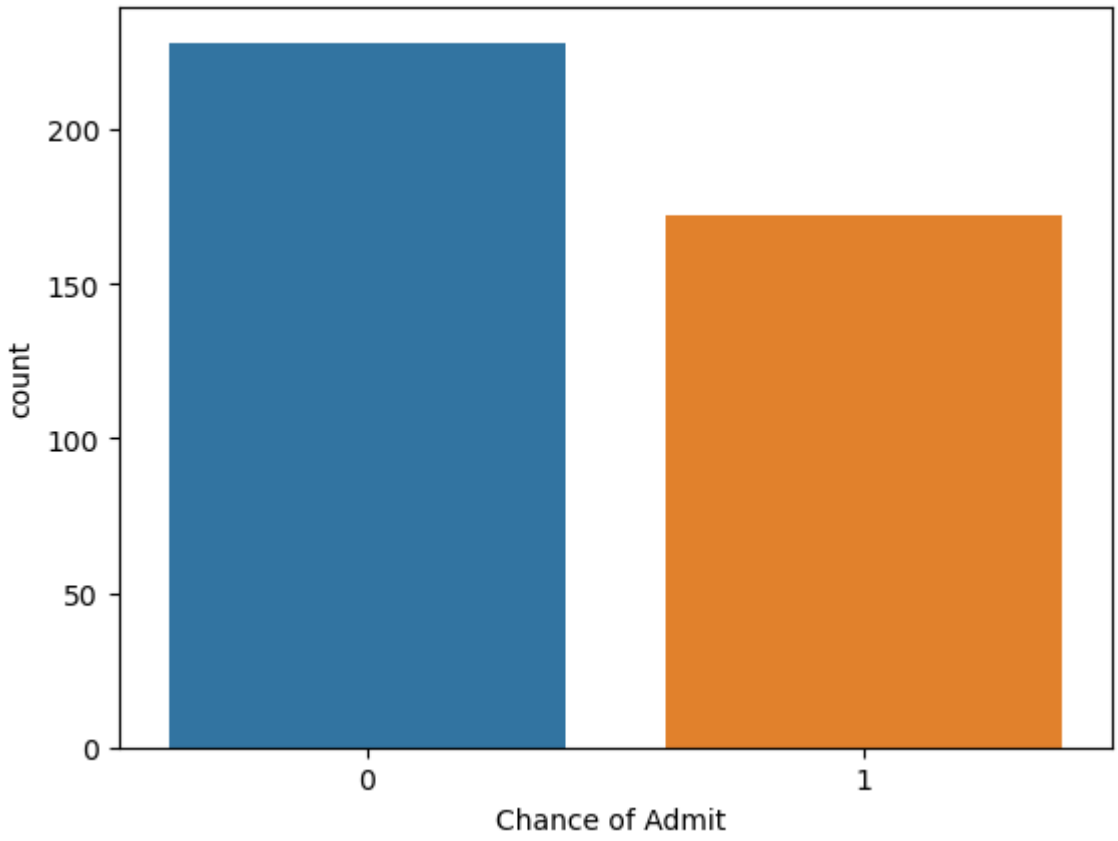
In [46]:
```
#Changes float to int
y = y.astype('int')   #series class method
```

In [47]:
```
y
```

Out[47]:
```
0      1
1      1
2      0
3      1
4      0
      ..
395    1
396    1
397    1
398    0
399    1
Name: Chance of Admit , Length: 400, dtype: int32
```

In [48]:
```
sns.countplot(x=y)
```

Out[48]:
```
<Axes: xlabel='Chance of Admit ', ylabel='count'>
```



In [51]:
```
y.value_counts()
```

Out[51]:
```
0    228
1    172
Name: Chance of Admit , dtype: int64
```

In [52]:
```
#Cross-Validation
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.25, random_stat
```

In [53]:
```
x_train.shape
```

Out[53]:
```
(300, 8)
```

In [54]:
```
x_test.shape
```

Out[54]:
```
(100, 8)
```

In [55]:
```
#Import the class
from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier(random_state=0)
classifier.fit(x_train, y_train)
```

Out[55]:
```
DecisionTreeClassifier
DecisionTreeClassifier(random_state=0)
```

In [56]:
```
y_pred = classifier.predict(x_test)
```

In [57]:
```
result = pd.DataFrame({
    'actual':y_test,
    'predicted':y_pred
})
```

In [58]:
```
result
```

Out[58]:

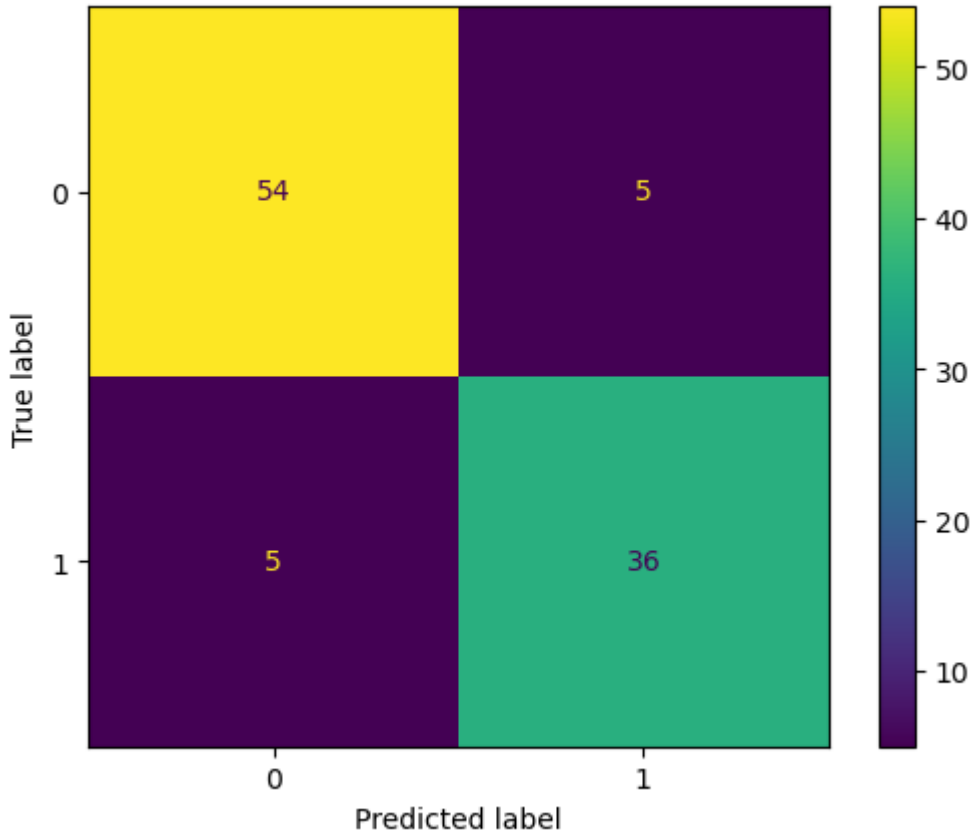
	actual	predicted
132	0	0
309	0	0
341	1	1
196	0	0
246	0	1
...	...	...
146	0	0
135	1	1
390	0	0
264	0	0
364	1	1

100 rows × 2 columns

In [59]:
```
from sklearn.metrics import ConfusionMatrixDisplay, accuracy_score
from sklearn.metrics import classification_report
```

In [61]:
```
ConfusionMatrixDisplay.from_predictions(y_test, y_pred)
```

Out[61]:
```
<sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x23fbfac9650>
```



In [62]:
```
accuracy_score(y_test, y_pred)
```

Out[62]:
```
0.9
```

In [63]:
```
print(classification_report(y_test, y_pred))
```

```
              precision    recall  f1-score   support

           0       0.92      0.92      0.92        59
           1       0.88      0.88      0.88        41

    accuracy                           0.90       100
   macro avg       0.90      0.90      0.90       100
weighted avg       0.90      0.90      0.90       100
```

In [75]:
```
#predict for new values
new = [[240,100,90,3,3.0,3.5,9.11,0]]
classifier.predict(new)[0]
```

```
C:\Users\Dell\anaconda3\Lib\site-packages\sklearn\base.py:439: UserWarning: X does not have valid feature names, but DecisionTreeClassifier was fitted with feature names
  warnings.warn(
```

Out[75]:
```
0
```

In [76]:
```
#Decision Tree
from sklearn.tree import plot_tree
import matplotlib.pyplot as plt
```

In [89]:
```
plt.figure(figsize=(140,80))
plot_tree(classifier, fontsize=40, filled=True, rounded=True, feature_names = x.col
          class_names=['NA','AD']);
```