Import Dataset

In [1]:
```
import pandas as pd
```

In [2]:
```
df = pd.read_csv(r"C:\Users\PC1\Desktop\DS\DataSets\Admission_Predict_Ver1.1.csv") #reading file from device
```

In [3]:
```
df #verifying read
```

Out[3]:

	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
...	...	...	...	...	...	...	...	...	...
495	496	332	108	5	4.5	4.0	9.02	1	0.87
496	497	337	117	5	5.0	5.0	9.87	1	0.96
497	498	330	120	5	4.5	5.0	9.56	1	0.93
498	499	312	103	4	4.0	5.0	8.43	0	0.73
499	500	327	113	4	4.5	4.5	9.04	0	0.84

500 rows × 9 columns

In [4]:
```
df.columns #showing name of all columns
```

Out[4]:
```
Index(['Serial No.', 'GRE Score', 'TOEFL Score', 'University Rating', 'SOP',
       'LOR ', 'CGPA', 'Research', 'Chance of Admit '],
      dtype='object')
```

Data Pre-processing

In [5]:
```
from sklearn.preprocessing import Binarizer
```

In [6]:
```
bi = Binarizer(threshold=0.80)  # for changing values >0.8 to 1 & <0.8 to 0
```

In [7]:
```
df['Chance of Admit '] = bi.fit_transform(df[['Chance of Admit ']]) #transformation
```

In [8]:
```
df #verifying changes
```

Out[8]:

	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	0.0
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	0.0
4	5	314	103	2	2.0	3.0	8.21	0	0.0
...	...	...	...	...	...	...	...	...	...
495	496	332	108	5	4.5	4.0	9.02	1	1.0
496	497	337	117	5	5.0	5.0	9.87	1	1.0
497	498	330	120	5	4.5	5.0	9.56	1	1.0
498	499	312	103	4	4.0	5.0	8.43	0	0.0
499	500	327	113	4	4.5	4.5	9.04	0	1.0

500 rows × 9 columns

In [9]:
```
x = df.drop('Chance of Admit ', axis=1) #A DataFrame object has two axes: “axis 0” and “axis 1”. “axis 0” represents r
y = df['Chance of Admit ']
```

In [10]:
```
x
```

Out[10]:

	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
...	...	...	...	...	...	...	...	...
495	496	332	108	5	4.5	4.0	9.02	1
496	497	337	117	5	5.0	5.0	9.87	1
497	498	330	120	5	4.5	5.0	9.56	1
498	499	312	103	4	4.0	5.0	8.43	0
499	500	327	113	4	4.5	4.5	9.04	0

500 rows × 8 columns

In [11]:
```
y
```

Out[11]:
```
0      1.0
1      0.0
2      0.0
3      0.0
4      0.0
      ...
495    1.0
496    1.0
497    1.0
498    0.0
499    1.0
Name: Chance of Admit , Length: 500, dtype: float64
```

In [12]:
```
 y.value_counts() #count in number format
```

Out[12]:
```
0.0    358
1.0    142
Name: Chance of Admit , dtype: int64
```

Data Split

In [13]:
```
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, random_state = 0, test_size = 0.2)
```

In [14]:
```
x_train.shape
```

Out[14]:
```
(400, 8)
```

In [15]:
```
y_train.shape
```

Out[15]:
```
(400,)
```

In [16]:
```
x_test.shape
```

Out[16]:
```
(100, 8)
```

In [17]:
```
y_test.shape
```

Out[17]:
```
(100,)
```

Model Building

In [18]:
```
from sklearn.tree import DecisionTreeClassifier
```

In [19]:
```
classifier = DecisionTreeClassifier(random_state=0)
```

In [20]:
```
classifier.fit(x_train, y_train)
```

Out[20]:
```
DecisionTreeClassifier
DecisionTreeClassifier(random_state=0)
```

In [21]:
```
y_pred = classifier.predict(x_test) #predeicting using model built
```

In [22]:
```
result = pd.DataFrame({
    'actual': y_test,
    'predicted' : y_pred
}) #visualising actual & predicted data
```

In [23]:
```
result
```

Out[23]:

	actual	predicted
90	0.0	0.0
254	1.0	1.0
283	0.0	0.0
445	1.0	1.0
461	0.0	0.0
...	...	...
372	1.0	1.0
56	0.0	0.0
440	0.0	0.0
60	0.0	0.0
208	0.0	0.0

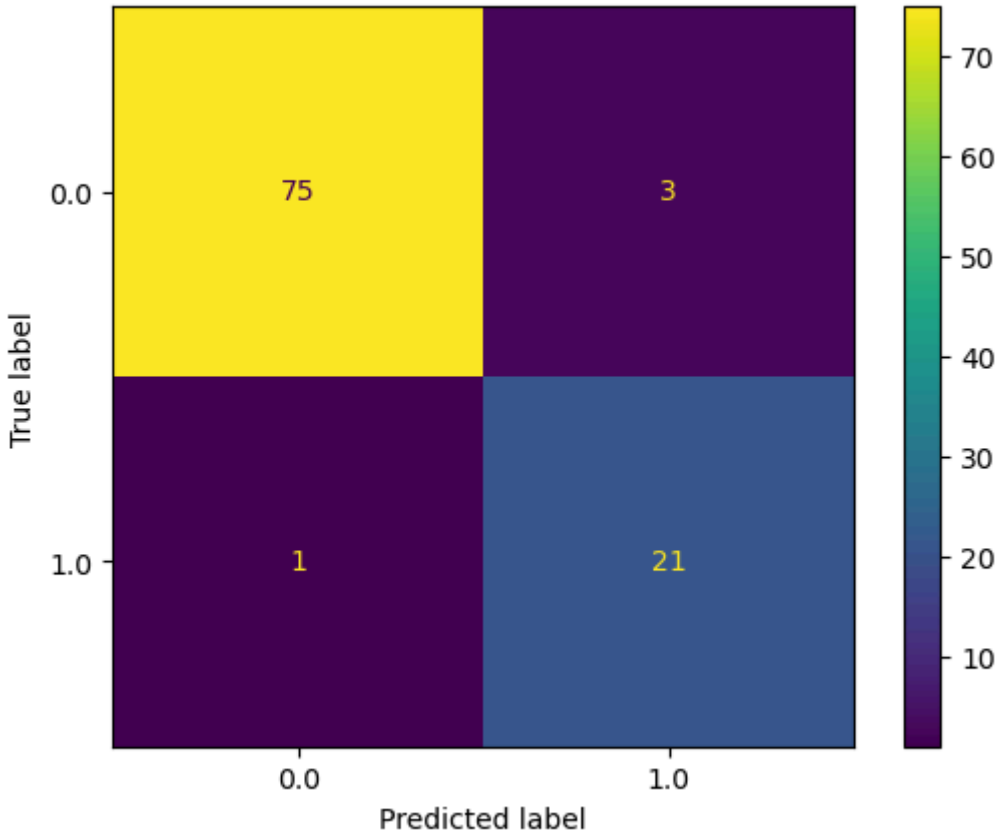
100 rows × 2 columns

Model Evaluation

In [24]:
```
from sklearn.metrics import ConfusionMatrixDisplay, accuracy_score, classification_report
```

In [25]:
```
ConfusionMatrixDisplay.from_predictions(y_test, y_pred)
```

Out[25]:
```
<sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x202dc3f7970>
```



In [26]:
```
accuracy_score(y_test, y_pred)
```

Out[26]:
```
0.96
```

In [27]:
```
print(classification_report(y_test, y_pred))
```

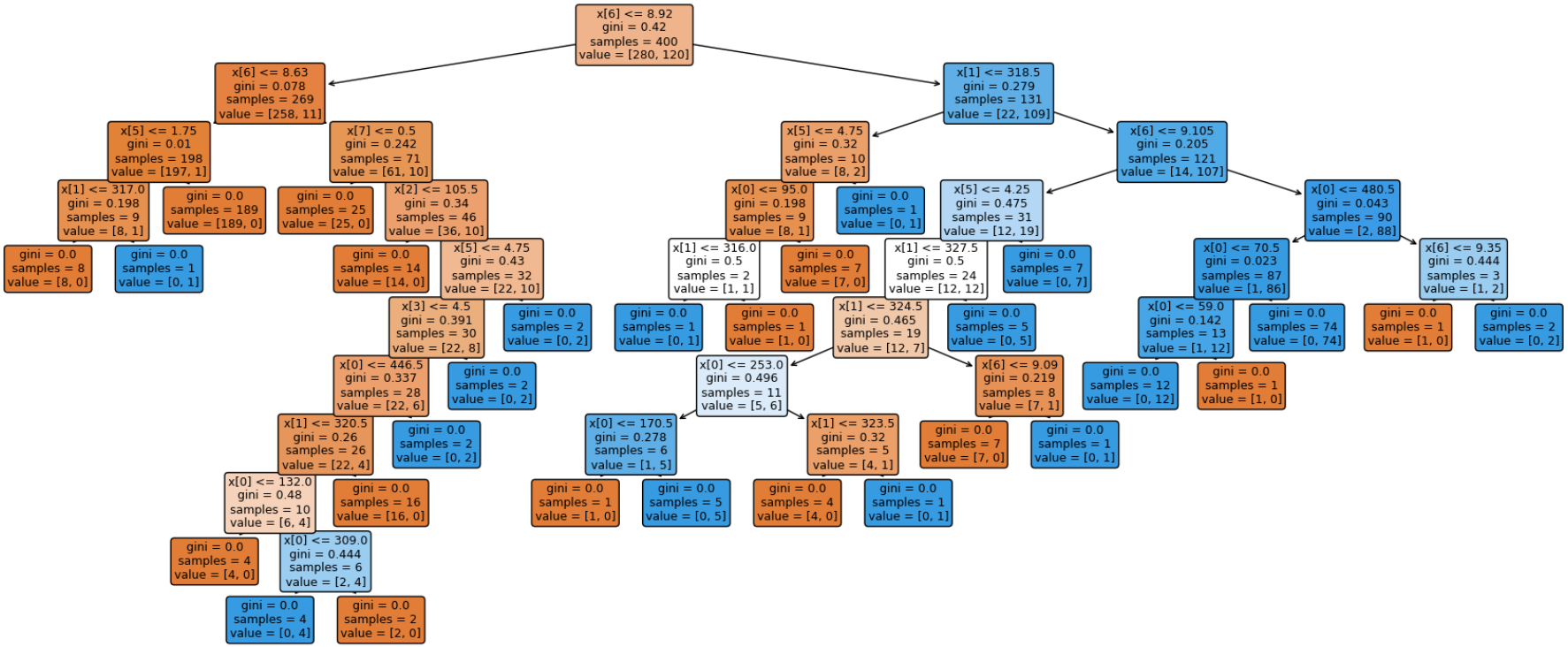
```
              precision    recall  f1-score   support

         0.0       0.99      0.96      0.97        78
         1.0       0.88      0.95      0.91        22

    accuracy                           0.96       100
   macro avg       0.93      0.96      0.94       100
weighted avg       0.96      0.96      0.96       100
```

Printing Decision Tree

In [28]:
```
from sklearn.tree import plot_tree
```

In [29]:
```
import matplotlib.pyplot as plt
```

In [30]:
```
plt.figure(figsize=(22,9))
plot_tree(classifier, fontsize = 9, filled=True, rounded=True);
```



In [31]:
```
plt.figure(figsize=(28,12))
plot_tree(classifier, fontsize = 10, filled=True, rounded=True, feature_names=x.columns, class_names=['NA', 'AD']);
```