Etapa 2 Diseño de sistemas de aprendizaje automatico

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Grupo:

**Análisis de datos\_202016908A\_1394**

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**Arbol de desiciones**

**Código**

Arbol

import pandas as pd

from sklearn.model\_selection import train\_test\_split

from sklearn.tree import DecisionTreeClassifier

from sklearn.metrics import accuracy\_score, classification\_report

import matplotlib.pyplot as plt

from sklearn import tree

nombres = ['Class', 'Alcohol', 'Malic acid', 'Ash', 'Alcalinity of ash', 'Magnesium', 'Total phenols', 'Flavanoids', 'Nonflavanoid phenols', 'Proanthocyanins', 'Color intensity', 'Hue', 'OD280/OD315 of diluted wines', 'Proline']

datos = pd.read\_csv("wine.data", names=nombres)

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print(datos.head())

​ Class Alcohol Malic acid Ash Alcalinity of ash Magnesium \

0 1 14.23 1.71 2.43 15.6 127

1 1 13.20 1.78 2.14 11.2 100

2 1 13.16 2.36 2.67 18.6 101

3 1 14.37 1.95 2.50 16.8 113

4 1 13.24 2.59 2.87 21.0 118

Total phenols Flavanoids Nonflavanoid phenols Proanthocyanins \

0 2.80 3.06 0.28 2.29

1 2.65 2.76 0.26 1.28

2 2.80 3.24 0.30 2.81

3 3.85 3.49 0.24 2.18

4 2.80 2.69 0.39 1.82

Color intensity Hue OD280/OD315 of diluted wines Proline

0 5.64 1.04 3.92 1065

1 4.38 1.05 3.40 1050

2 5.68 1.03 3.17 1185

3 7.80 0.86 3.45 1480

4 4.32 1.04 2.93 735

//divide datos de entrenamiento y prueba

X = datos.drop("Class", axis=1)

y = datos["Class"]

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)

//creacion y entreno dle modelo

modelo = DecisionTreeClassifier(random\_state=42)

modelo.fit(X\_train, y\_train)

//prediccion y evaluacion

y\_pred = modelo.predict(X\_test)

print(f"Accuracy: {accuracy\_score(y\_test, y\_pred)}")

print(f"Classification Report:\n{classification\_report(y\_test, y\_pred)}")

Accuracy: 0.9444444444444444

Classification Report:

precision recall f1-score support

1 0.93 0.93 0.93 14

2 0.93 1.00 0.97 14

3 1.00 0.88 0.93 8

accuracy 0.94 36

macro avg 0.95 0.93 0.94 36

weighted avg 0.95 0.94 0.94 36

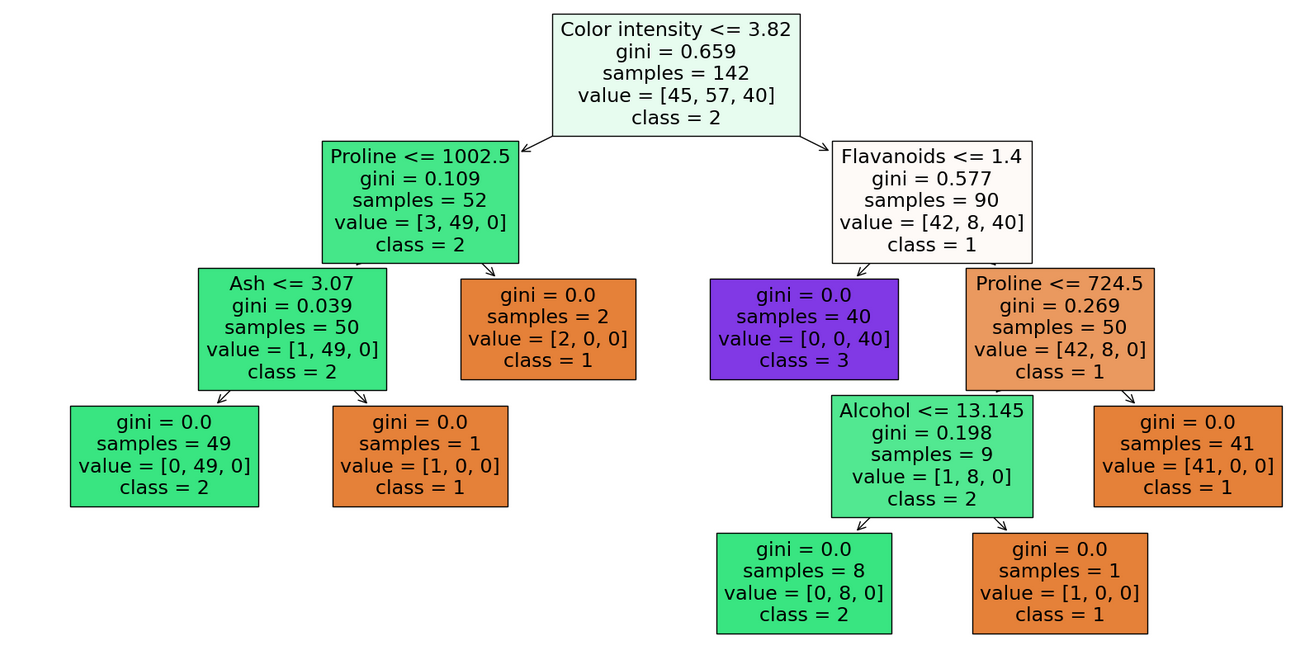
listas\_de\_las\_clases = [str(i) for i in datos['Class'].unique()]

plt.figure(figsize=(20,10))

tree.plot\_tree(modelo, filled=True, feature\_names=nombres[1:], class\_names=listas\_de\_las\_clases)

plt.show()

**Arbol grafico**

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**Análisis**