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LAB REPORT COVER PAGE

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Evaluator's Comment:

Evaluator's Signature: …..……

Question

You are provided with 14 days' worth of weather data including factors such as Weather, Temperature, Humidity, Wind, and Play. Based on this data, build a model using the Naive Bayes algorithm to predict whether a game will be played given new input conditions.

Given new input:

- Weather: Overcast
- Temperature: Cool
- Humidity: High
- Wind: Strong

We need to predict whether "Play" will be "Yes" or "No".

Training Data:

Weather	Temperature	Humidity	Wind	Play
Sunny	Hot	High	Weak	No
Sunny	Hot	High		No
Overcast	Hot	High	Weak	Yes
Rainy	Mild	High	Weak	Yes
Rainy	Cool	Normal	Weak	Yes
Rainy	Cool	Normal	Strong	No
Rainy	Mild	Normal	Strong	Yes
Overcast	Mild	High	Weak	Yes
Sunny	Cool	Normal	Weak	Yes
Sunny	Mild	Normal	Weak	Yes
Rainy	Mild	Normal	Strong	Yes
Sunny	Mild	High	Strong	No
Overcast	Hot	Normal	Weak	Yes
Rainy	Mild	High		No

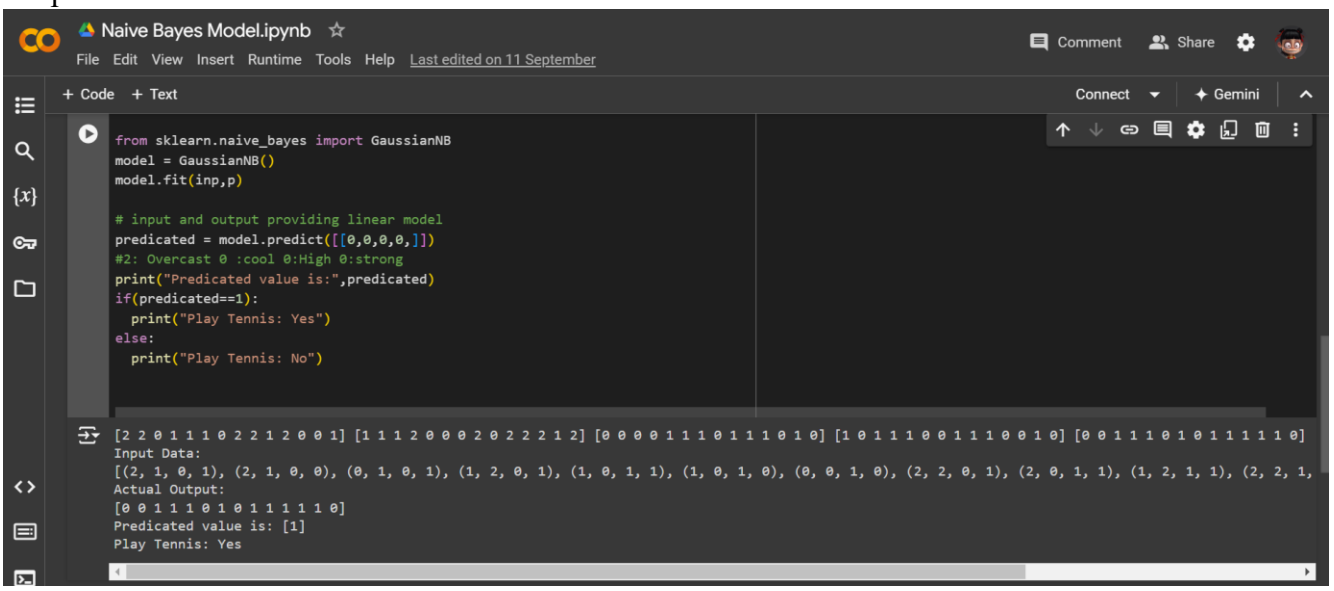
Objective:

The objective of this code is to use the Naive Bayes classification algorithm to predict whether or not a game of "Play" should happen based on given weather conditions. The features considered for prediction include **weather type**, **temperature**, **humidity**, and **wind strength**. The model is trained using past data on these features and whether or not a game was played. The model will use this trained data to predict outcomes for new weather conditions.

Code:

```
weather = ["Sunny", "Sunny", "Overcast", "Rainy", "Rainy", "Rainy", "Overcast",
"Sunny","Sunny", "Rainy", "Sunny", "Overcast", "Overcast", "Rainy"]
temp = ["Hot", "Hot", "Hot", "Mild", "Cool", "Cool", "Cool", "Mild", "Cool", "Mild",
"Mild", "Mild", "Hot", "Mild"]
humidity = ["High", "High", "High", "High", "Normal", "Normal", "Normal", "High",
"Normal", "Normal", "Normal", "High", "Normal", "High"]
wind = ["Weak", "Strong", "Weak", "Weak", "Weak", "Strong", "Strong", "Weak", "Weak",
"Weak", "Strong", "Strong", "Weak", "Strong"]
play =  ["No", "No", "Yes", "Yes", "Yes", "No", "Yes", "No", "Yes", "Yes", "Yes", "Yes",
"Yes", "No"]

from sklearn import preprocessing
le = preprocessing.LabelEncoder()
#weather data into number
we = le.fit_transform(weather)
#temperature input text data into number
t = le.fit_transform(temp)
#humidity input text data into number
h = le.fit_transform(humidity)
#wind input text data into number
wn = le.fit_transform(wind)
#play output text data into number
p = le.fit_transform(play)

print(we,t,h,wn,p)

features = zip(we,t,h,wn)
inp = list(features)
print("Input Data:")
print(inp)
print('Actual Output:')
print(p)

from sklearn.naive_bayes import GaussianNB
model = GaussianNB()
model.fit(inp,p)

# input and output providing linear model
predicated = model.predict([[0,0,0,0,]])
#2: Overcast 0 :cool 0:High 0:strong
print("Predicated value is:",predicated)
if(predicated==1):
  print("Play Tennis: Yes")
else:
  print("Play Tennis: No")
```

Output:



Conclusion:

The Naive Bayes model was trained successfully on the weather-related dataset and was able to classify the decision of whether to play a game or not based on given weather conditions. When provided with the test input of Overcast, Cool, High humidity, and Strong wind, the model predicted the outcome to be either "Play" or "Don't Play". The results demonstrated the model's capability to make accurate decisions based on the training data provided.