

# social-network-ads-bayes

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## 1 Social Network Ads activity with Bayes classification.

### 1.0.1 Isai Ambrocio - A01625101

Libraries

```
[ ]: import pandas as pd
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score, confusion_matrix, \
    ConfusionMatrixDisplay
from sklearn.naive_bayes import GaussianNB
```

```
[ ]: df = pd.read_csv("/content/Social_Network_Ads.csv")
```

```
[ ]: df.head()
```

```
[ ]:
```

	User ID	Gender	Age	EstimatedSalary	Purchased
0	15624510	Male	19	19000	0
1	15810944	Male	35	20000	0
2	15668575	Female	26	43000	0
3	15603246	Female	27	57000	0
4	15804002	Male	19	76000	0

```
[ ]: df.shape
```

```
[ ]: (400, 5)
```

```
[ ]: df1 = df.drop(["User ID"], axis=1)
```

```
[ ]: x_train, x_test, y_train, y_test = train_test_split(df1.iloc[:,1:-1], df1.iloc[:,
    -1], test_size=0.2, random_state=42)
```

```
[ ]: nb = GaussianNB()
nb.fit(x_train, y_train)
```

```
[ ]: y_hat_train = nb.predict(x_train)
y_hat_test = nb.predict(x_test)
```

```

train_acc = accuracy_score(y_train, y_hat_train)
test_acc = accuracy_score(y_test, y_hat_test)
print(f"Training accuracy: {train_acc:.4f}\nTest accuracy: {test_acc:.4f}")

```

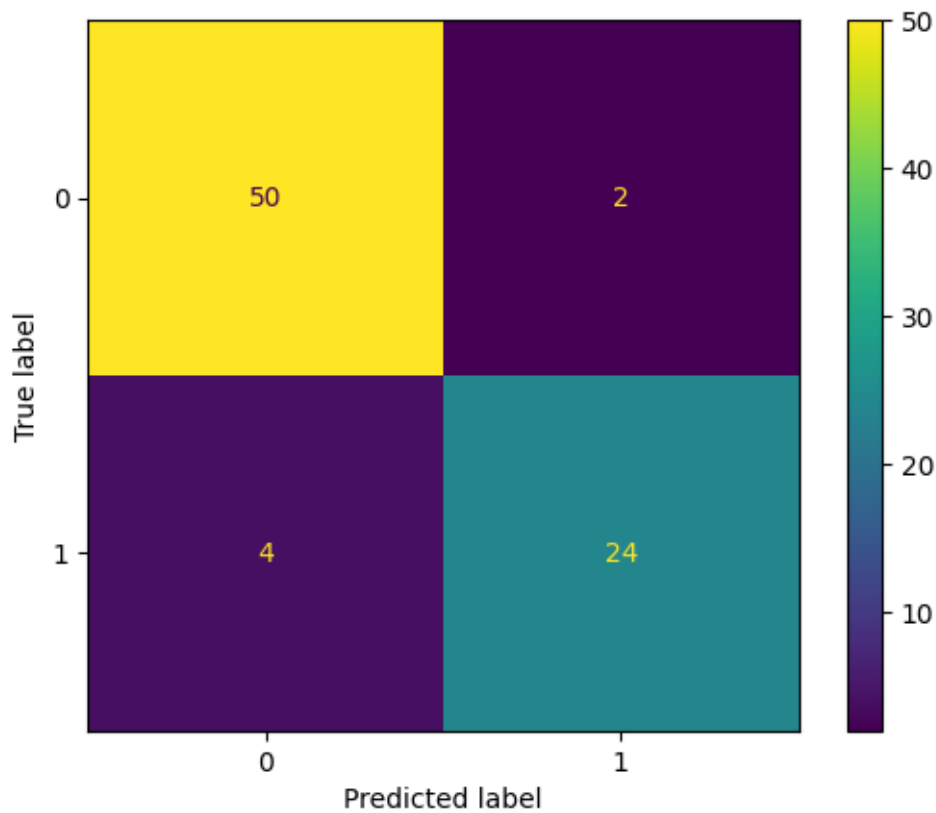
Training accuracy: 0.8625

Test accuracy: 0.9250

```

[ ]: test_conf_matrix = confusion_matrix(y_test, y_hat_test)
test_cm_disp = ConfusionMatrixDisplay(test_conf_matrix)
test_cm_disp.plot()
plt.show()

```



## 1.1 Adding Gender

```

[ ]: x_train, x_test, y_train, y_test = train_test_split(df1.iloc[:, :-1], df1.iloc[:,
↪, -1], test_size=0.2, random_state=42)

```

```

[ ]: nb = GaussianNB()
nb.fit(x_train, y_train)

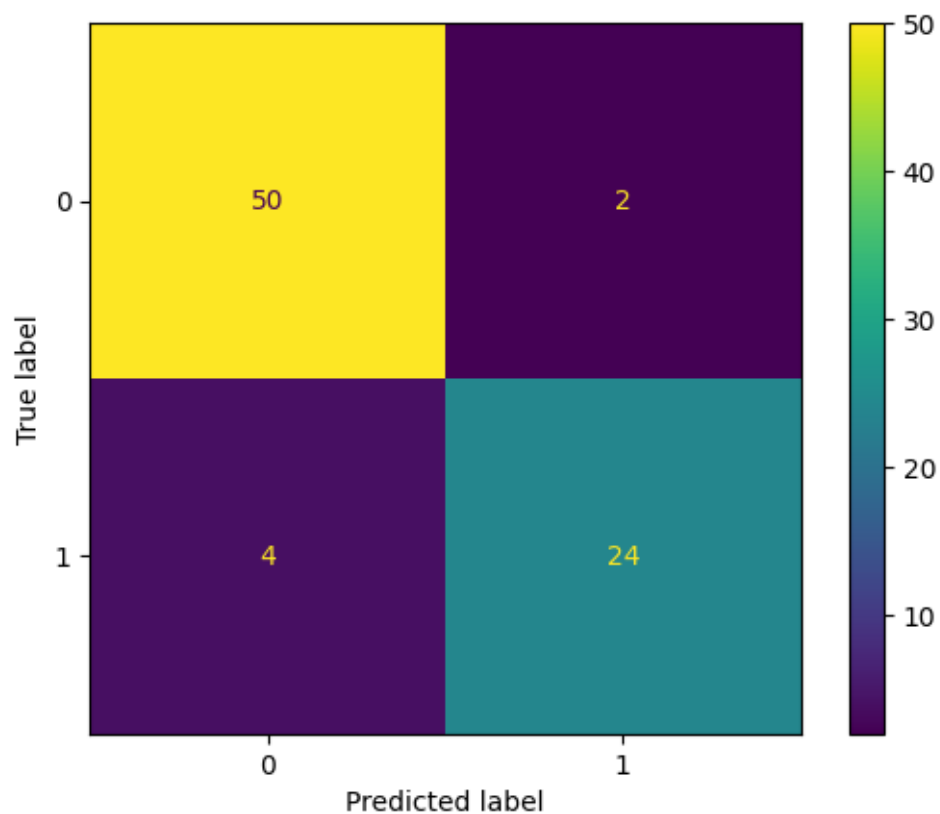
```

```
[ ]: y_hat_train = nb.predict(x_train)
      y_hat_test = nb.predict(x_test)
      train_acc = accuracy_score(y_train, y_hat_train)
      test_acc = accuracy_score(y_test, y_hat_test)
      print(f"Training accuracy: {train_acc:.4f}\nTest accuracy: {test_acc:.4f}")
```

Training accuracy: 0.8625

Test accuracy: 0.9250

```
[ ]: test_conf_matrix = confusion_matrix(y_test, y_hat_test)
      test_cm_disp = ConfusionMatrixDisplay(test_conf_matrix)
      test_cm_disp.plot()
      plt.show()
```



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