[4]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from math import exp

data =pd.read_csv("Social_Network_Ads.csv")
data.head()
```

[4]:

	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

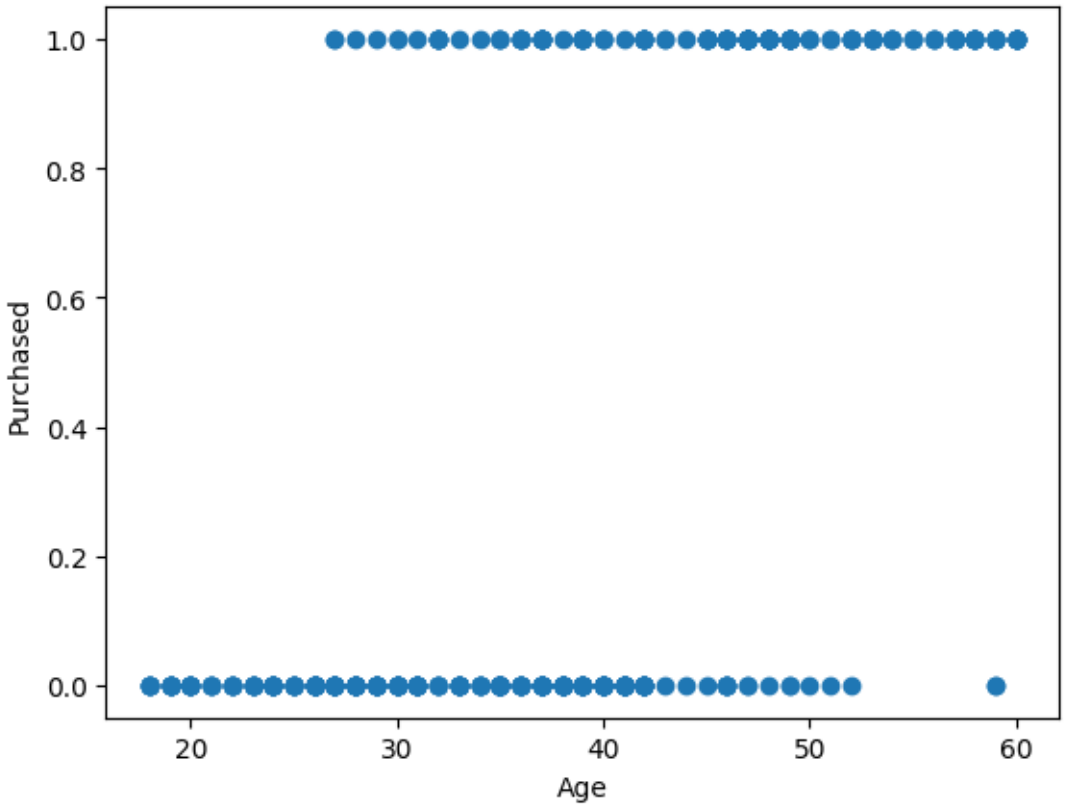
[5]:
```
data.describe()
```

[5]:

	User ID	Age	EstimatedSalary	Purchased
count	4.000000e+02	400.000000	400.000000	400.000000
mean	1.569154e+07	37.655000	69742.500000	0.357500
std	7.165832e+04	10.482877	34096.960282	0.479864
min	1.556669e+07	18.000000	15000.000000	0.000000
25%	1.562676e+07	29.750000	43000.000000	0.000000
50%	1.569434e+07	37.000000	70000.000000	0.000000
75%	1.575036e+07	46.000000	88000.000000	1.000000
max	1.581524e+07	60.000000	150000.000000	1.000000

[6]:
```
plt.scatter(data['Age'], data['Purchased'])
plt.xlabel("Age")
plt.ylabel("Purchased")
plt.show()

X_train,␣
 ↪X_test,y_train,y_test=train_test_split(data["Age"],data["Purchased"],test_size=0.
 ↪2)
```



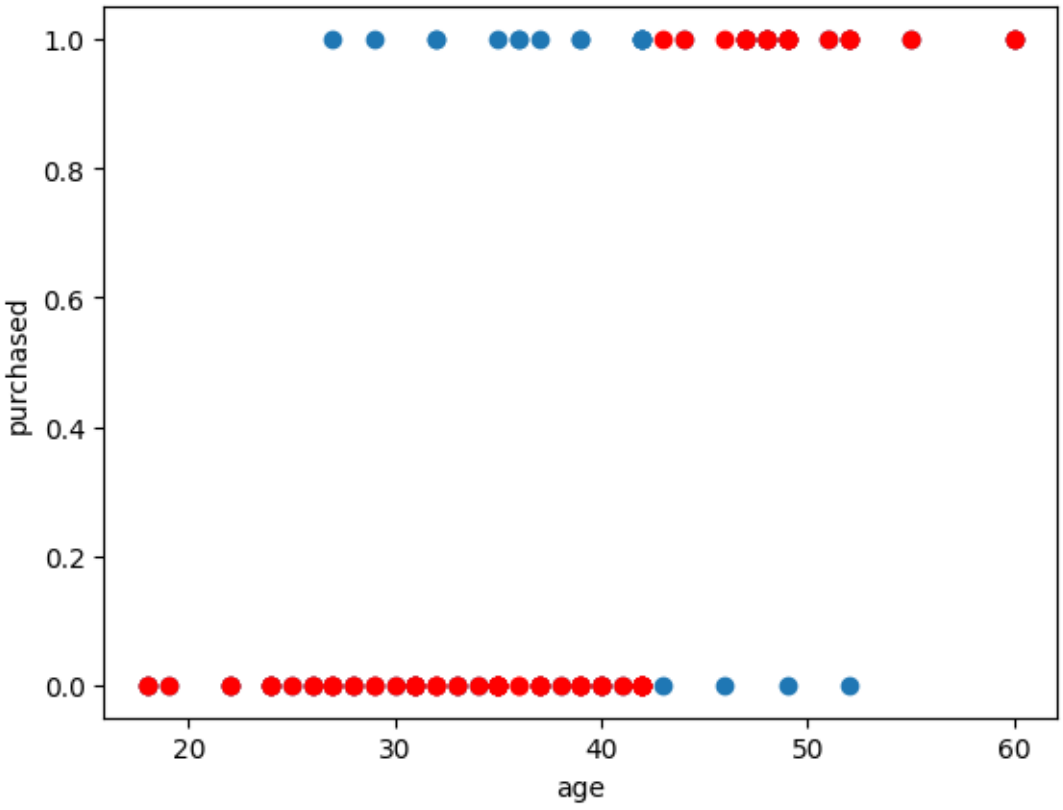
[8]:
```
from sklearn.linear_model import LogisticRegression

model = LogisticRegression()
model.fit(X_train.values.reshape(-1,1),y_train.values.reshape(-1,1).ravel())

y_pred_sk = model.predict(X_test.values.reshape(-1, 1))
plt.clf()
plt.scatter(X_test, y_test)
plt.scatter(X_test,y_pred_sk,c="red")

plt.xlabel("age")
plt.ylabel("purchased")
plt.show()

print(f"Accuracy = {model.score(X_test.values.reshape(-1, 1),y_test.values.
 ↪reshape(-1, 1))}")
```




```
Accuracy = 0.7625
```

[10]:
```
from sklearn.metrics import confusion_matrix
tn, fp, fn, tp = confusion_matrix(y_test, y_pred_sk).ravel()
print("True Negatives: ",tn)
print("False Positives: ",fp)
print("False Negatives: ",fn)
print("True Positives: ",tp)
```

```
True Negatives:  45
False Positives:  4
False Negatives:  15
True Positives:  16
```

[11]:
```
Accuracy = (tn+tp)*100/(tp+tn+fp+fn)
print("Accuracy {:0.2f}%:".format(Accuracy))
```

```
Accuracy 76.25%:
```

[12]:
```
Precision = tp/(tp+fp)
print("Precision {:0.2f}".format(Precision))
```

```
Precision 0.80
```

[13]:
```
Recall = tp/(tp+fn)
print("Recall {:0.2f}".format(Recall))
```

```
Recall 0.52
```

[14]:
```
err = (fp + fn)/(tp + tn + fn + fp)
print("Error rate {:0.2f}".format(err))
```

```
Error rate 0.24
```