In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [5]:
```
dataset = pd.read_csv("/home/ubuntu/TE_39/Social_Network_Ads.csv")
```

In [6]:
```
dataset.head()
```

Out[6]:

	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

In [7]:
```
dataset.isnull().sum()
```

Out[7]:
```
User ID            0
Gender             0
Age                0
EstimatedSalary    0
Purchased          0
dtype: int64
```

In [8]:
```
dataset.duplicated().sum()
```

Out[8]:
```
0
```

In [9]:
```
mapi = {'Male':1,'Female':0}
dataset = dataset.replace(mapi)
dataset.head()
```

Out[9]:

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

In [10]:
```
dataset.drop(['User ID'],axis=1,inplace=True)
dataset.head()
```

Out[10]:

	Gender	Age	EstimatedSalary	Purchased
0	1	19	19000	0
1	1	35	20000	0
2	0	26	43000	0
3	0	27	57000	0
4	1	19	76000	0

In [11]:
```
x, y = dataset.drop(['Purchased'], axis=1), dataset['Purchased']
```

In [12]:
```
from sklearn.model_selection import train_test_split
xstrain, xtest, ytrain, ytest = train_test_split(x,y, test_size=0.25,random
```

In [13]:
```
from sklearn.preprocessing import StandardScaler
sc_scale = StandardScaler()
```

In [14]:
```
xstrain = sc_scale.fit_transform(xstrain)
xtest = sc_scale.transform(xtest)
```

In [15]:
```
from sklearn.linear_model import LogisticRegression
classifier = LogisticRegression(random_state = 0)
```

In [16]:
```
classifier.fit(xstrain,ytrain)
```

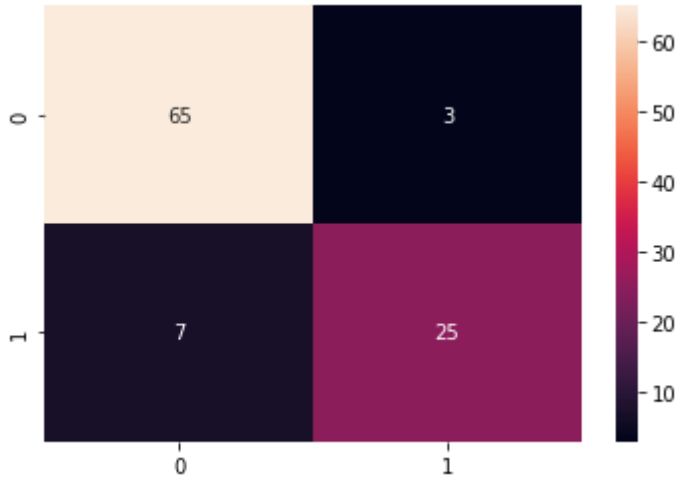
Out[16]:
```
▾        LogisticRegression

LogisticRegression(random_state=0)
```

In [17]:
```
y_pred = classifier.predict(xtest)
```

In [19]:
```
from sklearn.metrics import confusion_matrix
cm = confusion_matrix(ytest,y_pred)
print("Confusion Matrix : \n",cm)
```

```
Confusion Matrix :
 [[65  3]
 [ 7 25]]
```

In [20]:
```
import seaborn as sns
sns.heatmap(cm,annot=True)
plt.show()
```



In [21]:

```
from sklearn.metrics import accuracy_score
print("Accuracy : ", accuracy_score(ytest,y_pred)*100, '%')
```

```
Accuracy :  90.0 %
```

In [22]:

```
from sklearn.metrics import precision_score
from sklearn.metrics import recall_score
from sklearn.metrics import f1_score
```

In [23]:

```
#precision = tp /(tp + fp)
precision = precision_score(ytest,y_pred)
print('Precision : %f' % precision)
#recall= tp/(tp + fn)
recall = recall_score(ytest,y_pred)
print('Recall : %f' % recall)
#f1 = 2 tp / (2 tp + fp + fn)
f1 = f1_score(ytest,y_pred)
print('F1 score: %f' %f1)
```

```
Precision : 0.892857
Recall : 0.781250
F1 score: 0.833333
```

In [ ]: