

Exp No 4

Support Vector Classifier

```
In [1]: # importing libraries
import numpy as nm
import matplotlib.pyplot as mtp
import pandas as pd
```

```
In [2]: #importing datasets
data_set= pd.read_csv('User_Data.csv')
```

```
In [3]: data_set
```

Out[3]:

	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
...
395	15691863	Female	46	41000	1
396	15706071	Male	51	23000	1
397	15654296	Female	50	20000	1
398	15755018	Male	36	33000	0
399	15594041	Female	49	36000	1

400 rows × 5 columns

```
In [4]: #Extracting Independent and dependent Variable
x= data_set.iloc[:, [2,3]].values
y= data_set.iloc[:, 4].values
```



```
In [31]: print("x_train :", x_train.shape)
          print("y_train :", y_train.shape)
          print("x_test  :", x_test.shape)
          print("y_test  :", y_test.shape)
```

```
x_train : (300, 2)
y_train : (300,)
x_test  : (100, 2)
y_test  : (100,)
```

```
In [32]: #feature Scaling
from sklearn.preprocessing import StandardScaler
st_x= StandardScaler()
x_train= st_x.fit_transform(x_train)
x_test= st_x.transform(x_test)
```

```
In [33]: x_train
```

```
Out[33]: array([[ 0.58164944, -0.88670699],
 [-0.60673761,  1.46173768],
 [-0.01254409, -0.5677824 ],
 [-0.60673761,  1.89663484],
 [ 1.37390747, -1.40858358],
 [ 1.47293972,  0.99784738],
 [ 0.08648817, -0.79972756],
 [-0.01254409, -0.24885782],
 [-0.21060859, -0.5677824 ],
 [-0.21060859, -0.19087153],
 [-0.30964085, -1.29261101],
 [-0.30964085, -0.5677824 ],
 [ 0.38358493,  0.09905991],
 [ 0.8787462 , -0.59677555],
 [ 2.06713324, -1.17663843],
 [ 1.07681071, -0.13288524],
 [ 0.68068169,  1.78066227],
 [-0.70576986,  0.56295021],
 [ 0.77971394,  0.35999821],
 [ 0.8787462 ,  0.53878026],
```

```
In [34]: y_train
```

```
Out[34]: array([0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 1, 0, 0, 1, 0, 1,
                0, 1, 0, 0, 1, 1, 1, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0,
                0, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 0,
                0, 1, 1, 0, 0, 1, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0, 1, 1, 0, 1, 0, 0,
                1, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0, 1, 1,
                0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0,
                1, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 1, 0,
                0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0,
                1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 1, 0, 0, 1,
                0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0,
                0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0,
                1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 1,
                1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0,
                0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0], dtype=int64)
```

```
In [11]: from sklearn.svm import SVC # "Support vector classifier"
classifier = SVC(kernel='linear', random_state=0)
classifier.fit(x_train, y_train)
```

```
Out[11]: SVC(kernel='linear', random_state=0)
```

```
In [12]: #Predicting the test set result
y_pred= classifier.predict(x_test)
```

```
In [23]: y_pred
```

```
Out[23]: array([0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1,
                0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0,
                1, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1,
                0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 1, 0, 0, 1, 1, 0, 1,
                0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1], dtype=int64)
```

```
In [40]: #Prediction for random sample
sample_st = st_x.transform([[19,19000]])
print(classifier.predict(sample_st))

[0]
```

```
In [36]: #Creating the Confusion matrix
from sklearn.metrics import confusion_matrix
cm= confusion_matrix(y_test, y_pred)
print(cm)

[[66  2]
 [ 8 24]]
```

```
In [35]: classifier.score(x_test,y_test)
```

```
Out[35]: 0.9
```