

Objective:- SVM


```
[5.5, 4.2, 1.4, 0.2],
[4.9, 3.1, 1.5, 0.2],
[5. , 3.2, 1.2, 0.2],
[5.5, 3.5, 1.3, 0.2],
[4.9, 3.6, 1.4, 0.1],
[4.4, 3. , 1.3, 0.2],
[5.1, 3.4, 1.5, 0.2],
[5. , 3.5, 1.3, 0.3],
[4.5, 2.3, 1.3, 0.3],
[4.4, 3.2, 1.3, 0.2],
[5. , 3.5, 1.6, 0.6],
[5.1, 3.8, 1.9, 0.4],
[4.8, 3. , 1.4, 0.3],
[5.1, 3.8, 1.6, 0.2],
[4.6, 3.2, 1.4, 0.2],
[5.3, 3.7, 1.5, 0.2],
[5. , 3.3, 1.4, 0.2],
[7. , 3.2, 4.7, 1.4],
[6.4, 3.2, 4.5, 1.5],
[6.9, 3.1, 4.9, 1.5],
[5.5, 2.3, 4. , 1.3],
[6.5, 2.8, 4.6, 1.5],
[5.7, 2.8, 4.5, 1.3],
[6.3, 3.3, 4.7, 1.6],
[4.9, 2.4, 3.3, 1. ],

iris.feature_names

['sepal length (cm)',
 'sepal width (cm)',
 'petal length (cm)',
 'petal width (cm)']

iris.filename

'iris.csv'

iris.frame

iris.target

array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2])

iris.target_names

array(['setosa', 'versicolor', 'virginica'], dtype='<U10')

df=pd.DataFrame(iris.data,columns=iris.feature_names)

df.head()
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2

```
df['target']=iris.target

df.head()
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target
0	5.1	3.5	1.4	0.2	0
1	4.9	3.0	1.4	0.2	0
2	4.7	3.2	1.3	0.2	0

```
iris.target_names
array(['setosa', 'versicolor', 'virginica'], dtype='<U10')

df[df.target==1]
```

```
df.info

<bound method DataFrame.info of
0      5.1      3.5      1.4      0.2
1      4.9      3.0      1.4      0.2
2      4.7      3.2      1.3      0.2
3      4.6      3.1      1.5      0.2
4      5.0      3.6      1.4      0.2
..      ...      ...      ...      ...
```

145	6.7	3.0	5.2	2.3
146	6.3	2.5	5.0	1.9
147	6.5	3.0	5.2	2.0
148	6.2	3.4	5.4	2.3
149	5.9	3.0	5.1	1.8

```

target
0      0
1      0
2      0
3      0
4      0
..     ...
145    2
146    2
147    2
148    2
149    2

```

```
[150 rows x 5 columns]>
```

```

x = df.iloc[:, 0:-1].values
y = df.iloc[:, 4].values
print(x)

```

```

[[5.1 3.5 1.4 0.2]
 [4.9 3.  1.4 0.2]
 [4.7 3.2 1.3 0.2]
 [4.6 3.1 1.5 0.2]
 [5.  3.6 1.4 0.2]
 [5.4 3.9 1.7 0.4]
 [4.6 3.4 1.4 0.3]
 [5.  3.4 1.5 0.2]
 [4.4 2.9 1.4 0.2]
 [4.9 3.1 1.5 0.1]
 [5.4 3.7 1.5 0.2]
 [4.8 3.4 1.6 0.2]
 [4.8 3.  1.4 0.1]
 [4.3 3.  1.1 0.1]
 [5.8 4.  1.2 0.2]
 [5.7 4.4 1.5 0.4]
 [5.4 3.9 1.3 0.4]
 [5.1 3.5 1.4 0.3]
 [5.7 3.8 1.7 0.3]
 [5.1 3.8 1.5 0.3]
 [5.4 3.4 1.7 0.2]
 [5.1 3.7 1.5 0.4]
 [4.6 3.6 1.  0.2]
 [5.1 3.3 1.7 0.5]
 [4.8 3.4 1.9 0.2]
 [5.  3.  1.6 0.2]
 [5.  3.4 1.6 0.4]
 [5.2 3.5 1.5 0.2]
 [5.2 3.4 1.4 0.2]
 [4.7 3.2 1.6 0.2]
 [4.8 3.1 1.6 0.2]
 [5.4 3.4 1.5 0.4]
 [5.2 4.1 1.5 0.1]
 [5.5 4.2 1.4 0.2]
 [4.9 3.1 1.5 0.2]
 [5.  3.2 1.2 0.2]
 [5.5 3.5 1.3 0.2]
 [4.9 3.6 1.4 0.1]
 [4.4 3.  1.3 0.2]
 [5.1 3.4 1.5 0.2]
 [5.  3.5 1.3 0.3]
 [4.5 2.3 1.3 0.3]
 [4.4 3.2 1.3 0.2]
 [5.  3.5 1.6 0.6]
 [5.1 3.8 1.9 0.4]
 [4.8 3.  1.4 0.3]
 [5.1 3.8 1.6 0.2]
 [4.6 3.2 1.4 0.2]
 [5.3 3.7 1.5 0.2]
 [5.  3.3 1.4 0.2]
 [7.  3.2 4.7 1.4]
 [6.4 3.2 4.5 1.5]
 [6.9 3.1 4.9 1.5]
 [5.5 2.3 4.  1.3]
 [6.5 2.8 4.6 1.5]
 [5.7 2.8 4.5 1.3]
 [6.3 3.3 4.7 1.6]
 [4.9 2.4 3.3 1. ]

```

[illegible]

```
#train test split
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x,y, test_size=0.1)
```

```
print(x_train)
```

```
[[6.3 3.3 6. 2.5]
 [4.4 2.9 1.4 0.2]
 [7.2 3.6 6.1 2.5]
 [6.1 2.9 4.7 1.4]
 [5.8 2.7 4.1 1. ]
 [6.3 3.3 4.7 1.6]
 [5.4 3.4 1.5 0.4]
 [6.8 3. 5.5 2.1]
 [6.5 3.2 5.1 2. ]
 [6.7 3. 5. 1.7]
 [4.8 3. 1.4 0.1]
 [6.6 2.9 4.6 1.3]
 [6. 3.4 4.5 1.6]
 [4.7 3.2 1.3 0.2]
 [6.7 2.5 5.8 1.8]
 [5.1 3.3 1.7 0.5]
 [7.7 3.8 6.7 2.2]
 [5.8 2.7 5.1 1.9]
 [5. 3.5 1.6 0.6]
 [5. 3.6 1.4 0.2]
 [5.6 2.7 4.2 1.3]
 [6.7 3.1 4.7 1.5]
 [6. 2.9 4.5 1.5]
 [5.9 3.2 4.8 1.8]
 [7.2 3.2 6. 1.8]
 [5.2 4.1 1.5 0.1]
 [6.5 2.8 4.6 1.5]
 [6.2 2.2 4.5 1.5]
 [6.1 2.8 4. 1.3]
 [6.7 3. 5.2 2.3]
 [6.9 3.1 4.9 1.5]
 [4.5 2.3 1.3 0.3]
 [7.7 2.6 6.9 2.3]
 [6.3 3.4 5.6 2.4]
 [6.7 3.1 5.6 2.4]
 [5.7 2.6 3.5 1. ]
 [5.9 3. 4.2 1.5]
 [5.5 2.5 4. 1.3]
 [5.2 3.4 1.4 0.2]
 [5. 3.3 1.4 0.2]
 [5.8 2.7 3.9 1.2]
 [5.4 3.7 1.5 0.2]
 [4.4 3.2 1.3 0.2]
 [5.9 3. 5.1 1.8]
 [4.9 3. 1.4 0.2]
 [6.3 2.5 4.9 1.5]
 [4.8 3.1 1.6 0.2]
 [5.7 2.8 4.1 1.3]
 [5.5 2.4 3.8 1.1]
 [7.2 3. 5.8 1.6]
 [5.3 3.7 1.5 0.2]
 [5.5 2.3 4. 1.3]
 [6.3 2.5 5. 1.9]
 [6.9 3.2 5.7 2.3]
 [5.1 2.5 3. 1.1]
 [4.6 3.6 1. 0.2]
 [4.8 3. 1.4 0.3]
 [4.9 2.4 3.3 1. ]]
```

```
from sklearn.linear_model import LinearRegression
model=LinearRegression()
```

```
from sklearn.svm import SVC
model=SVC(kernel="linear")
```

```
model.fit(x_train, y_train)
y_predict = model.predict(x_test)
```

```
print(y_predict)
```

```
[1 2 1 0 1 0 0 0 2 0 2 1 1 1 2]
```

```
print(y_test)
```

```
[1 2 1 0 1 0 0 0 2 0 2 1 2 2 2]
```

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