

Experiment 4

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Branch: CSE

Semester: 5th

Subject Name: Machine Learning Lab

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Section/Group: 20BCS_WM-702A

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Subject Code: 20CSP-317

Aim/Overview of the practical:

Implement Support Vector Machine on any data set and analyze the accuracy with Logistic Regression.

Task to be done:

To implement Support Vector Machine on any data set.

Apparatus/Simulator Used:

- Google Collab
- Python
- .csv file

Code and Output:

```

%matplotlib inline
import numpy as np
import pandas as pd
import matplotlib
import matplotlib.pyplot as plt
import seaborn as sns
import sklearn
sns.set_style('whitegrid')

[9] print(np.__version__)
print(pd.__version__)
print(matplotlib.__version__)
print(sns.__version__)
print(sklearn.__version__)

1.21.6
1.3.5
3.2.2
0.11.2
1.0.2

```

```

[10] df=sns.load_dataset('iris')
df.head()

```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

```

col=['petal_length','petal_width','species']
data=df.loc[:,col]
data.head()

```

	petal_length	petal_width	species
0	1.4	0.2	setosa
1	1.4	0.2	setosa
2	1.3	0.2	setosa
3	1.5	0.2	setosa
4	1.4	0.2	setosa

```
[12] df.species.unique()

array(['setosa', 'versicolor', 'virginica'], dtype=object)
```

```
[13] colx=['petal_length','petal_width']
x=df.loc[:,colx]
x.head()
```

	petal_length	petal_width
0	1.4	0.2
1	1.4	0.2
2	1.3	0.2
3	1.5	0.2
4	1.4	0.2

```
label_to_num={'setosa' : 0,'versicolor' : 1,'virginica' : 2}
y=df.loc[:,col[2]].map(label_to_num)
y.head()
```

```
0    0
1    0
2    0
3    0
4    0
Name: species, dtype: int64
```

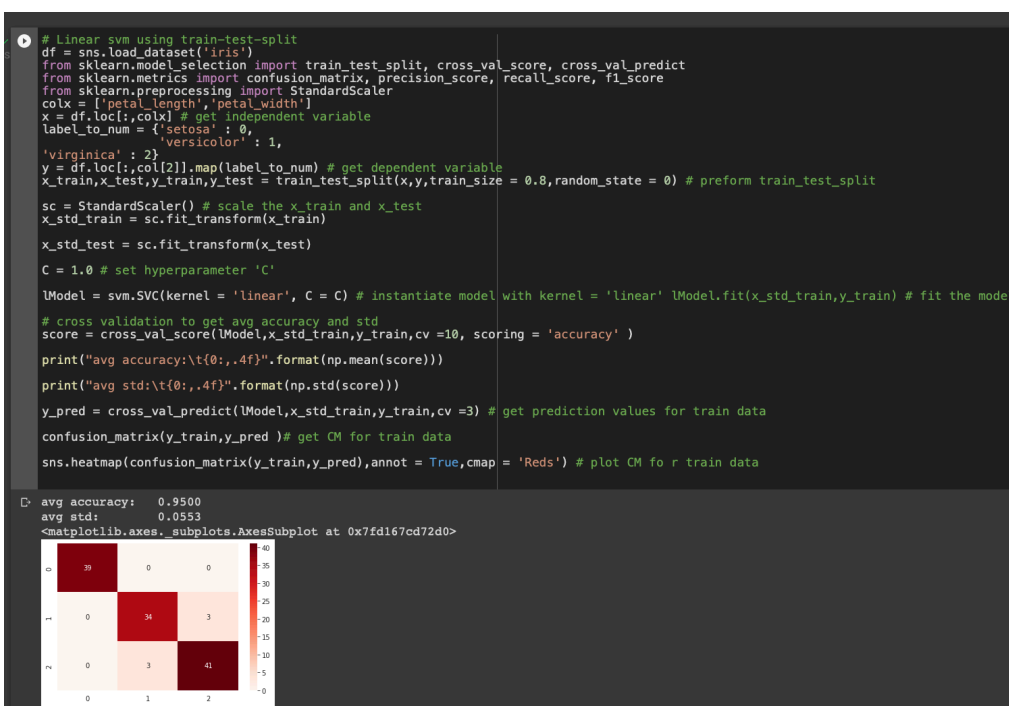
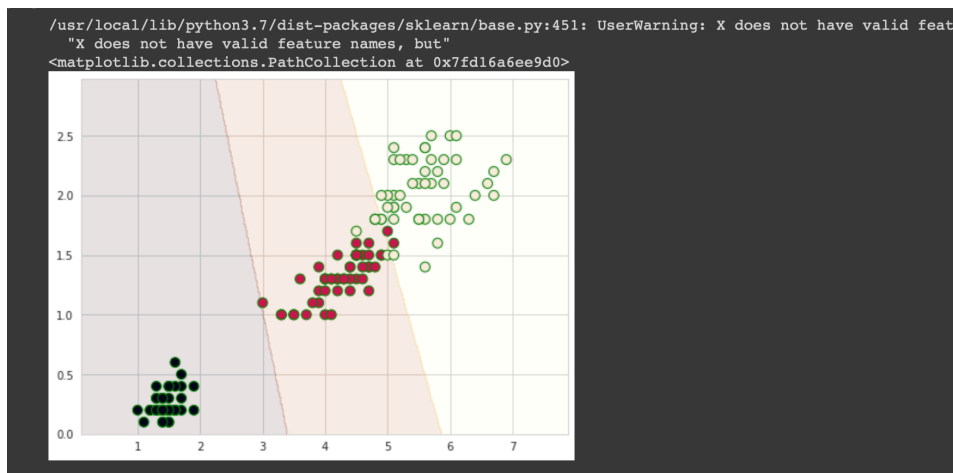
```
[15] from sklearn import svm
C=0.001
clf=svm.SVC(kernel='linear',C=C)
clf.fit(x,y)

SVC(C=0.001, kernel='linear')
```

```
[16] clf.predict([[6,2]])

/usr/local/lib/python3.7/dist-packages/sklearn/base.py:451: UserWarning: X does not have valid feature names, but
"X does not have valid feature names, but"
array([2])
```

```
xv=x.values.reshape(-1,1)
h=0.02
xmin,xmax=xv.min(),xv.max()+1
ymin,ymax=y.min(),y.max()+1
xx,yy=np.meshgrid(np.arange(xmin,xmax,h),np.arange(ymin,ymax,h))
z=clf.predict(np.c_[xx.ravel(),yy.ravel()])
z=z.reshape(xx.shape)
fig=plt.figure(figsize=(8,6))
ax=plt.contourf(xx,yy,z,cmap='afmhot',alpha=0.1)
plt.scatter(x.values[:,0],x.values[:,1],c=y,s=80,alpha=1,edgecolors='g')
```



Learning outcomes (What I have learnt):

- 1. Learnt how to implement linear regression**
- 2. Learnt about numpy, seaborn, pandas libraries.**
- 3. Learnt how to use python for linear regression.**
- 4. Learnt how to implement Support Vector Machine.**

Evaluation Grid :

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment) objectives/Outcomes.		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Total		30