LAB 7

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Implement a Support Vector Machine (SVM) classifier and evaluate its performance.

Dataset: Use the Breast Cancer Wisconsin dataset) from the UCI Machine Learning Repository.

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.metrics import accuracy_score, confusion_matrix,
classification_report
from sklearn.preprocessing import StandardScaler

from sklearn.datasets import load_breast_cancer
#load the Uci breast cancer dataset
data = load_breast_cancer()
X = data.data
y = data.target
df = pd.DataFrame(X, columns=data.feature_names)
df['target'] = y
df.head()
```

```
{"type":"dataframe","variable_name":"df"}
```

```
# Splitting the dataset into train and test sets
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.3, random_state=42)

# Standardize the feature set
scaler = StandardScaler()
X_train_scaled = scaler.fit_transform(X_train)
X_test_scaled = scaler.transform(X_test)

svm = SVC(kernel='linear')

# Train the model
svm.fit(X_train_scaled, y_train)
```

```
SVC(kernel='linear')
```

```python
# Predict on the test set
y_pred = svm.predict(X_test_scaled)

# Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
conf_matrix = confusion_matrix(y_test, y_pred)
class_report = classification_report(y_test, y_pred)

print(f'Accuracy: {accuracy * 100:.2f}%')
print("Confusion Matrix:\n", conf_matrix)
print("Classification Report:\n", class_report)
```

```
Accuracy: 97.66%
Confusion Matrix:
 [[ 61   2]
 [  2 106]]
Classification Report:
               precision    recall  f1-score   support

           0       0.97      0.97      0.97        63
           1       0.98      0.98      0.98       108

    accuracy                           0.98       171
   macro avg       0.97      0.97      0.97       171
weighted avg       0.98      0.98      0.98       171
```