ML LAB ASSIGNMENT 3

22MCA1055

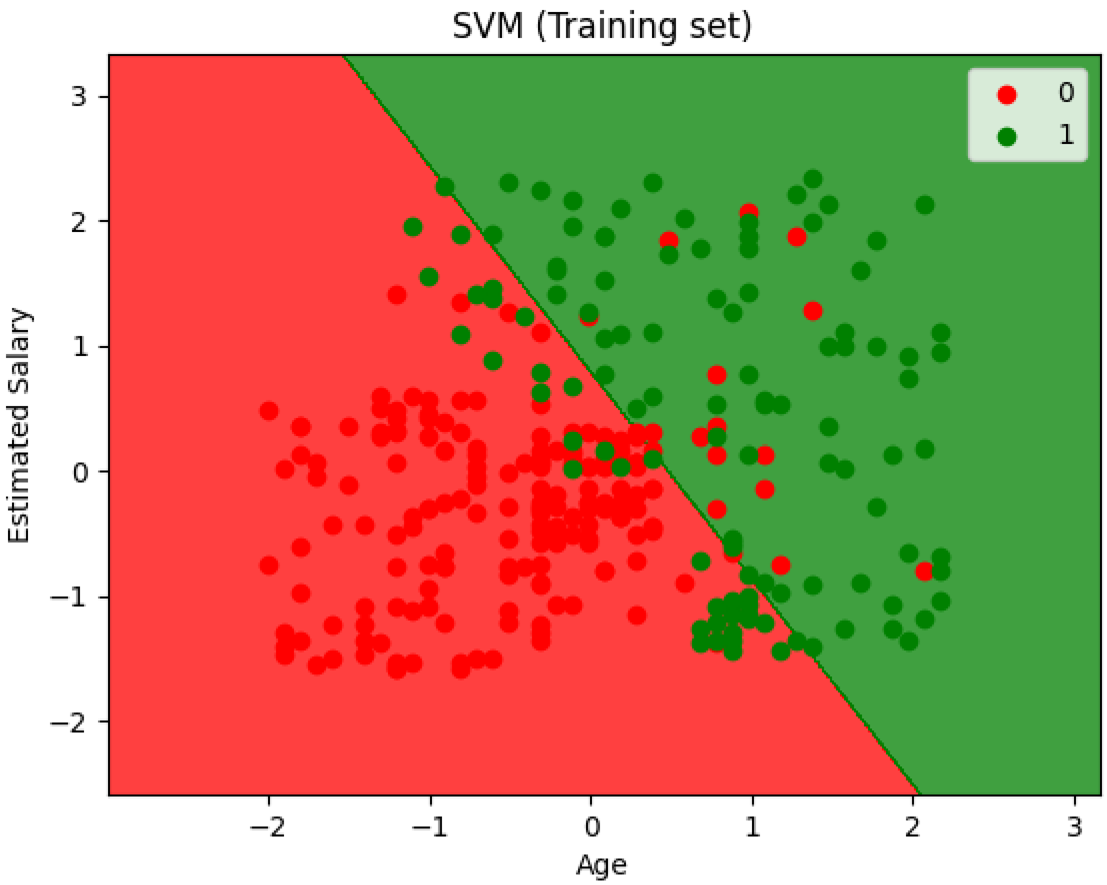
Please use a dataset for implementing Support Vector Machine. Please include the accuracy, precision, recall, f1-measure.

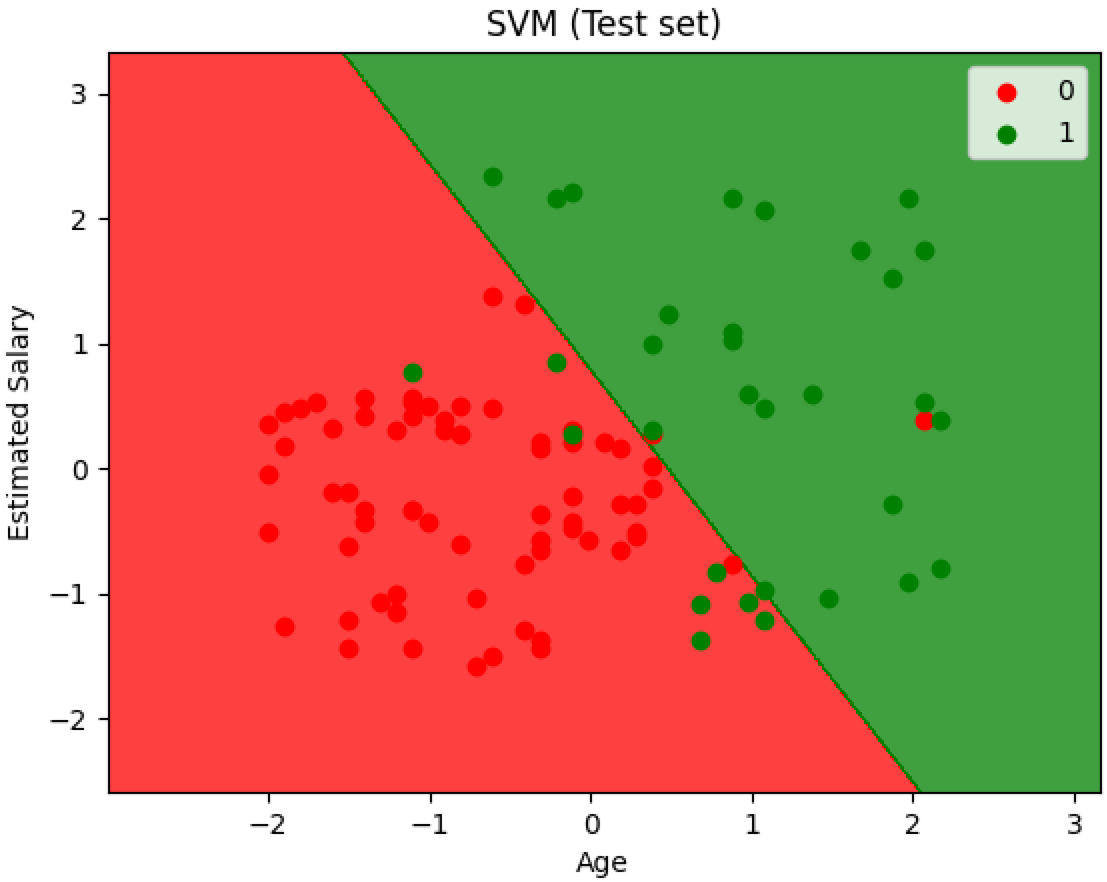
```
#Importing the libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

#Importing the dataset
dataset = pd.read_csv('Social_Network_Ads.csv')
X = dataset.iloc[:, [2, 3]].values
y = dataset.iloc[:, 4].values

#Splitting the dataset into the Training set and Test set
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size = 0.25, random_state = 0)

#Feature Scaling
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)

#Fitting SVM to the Training set
from sklearn.svm import SVC
classifier = SVC(kernel = 'linear', random_state = 0)
classifier.fit(X_train, y_train)
```

```
#Predicting the Test set results
y_pred = classifier.predict(X_test)

#Making the Confusion Matrix
from sklearn.metrics import confusion_matrix
from sklearn.metrics import classification_report
cm = confusion_matrix(y_test, y_pred)
print(cm)
print(classification_report(y_test, y_pred))

#Visualising the Training set results
from matplotlib.colors import ListedColormap
X_set, y_set = X_train, y_train
X1, X2 = np.meshgrid(np.arange(start = X_set[:, 0].min()
- 1, stop = X_set[:, 0].max() + 1, step = 0.01),
                     np.arange(start = X_set[:, 1].min()
- 1, stop = X_set[:, 1].max() + 1, step = 0.01))
plt.contourf(X1, X2,
classifier.predict(np.array([X1.ravel(),
X2.ravel()]).T).reshape(X1.shape),
             alpha = 0.75, cmap = ListedColormap(('red',
'green')))
plt.xlim(X1.min(), X1.max())
plt.ylim(X2.min(), X2.max())
for i, j in enumerate(np.unique(y_set)):
    plt.scatter(X_set[y_set == j, 0], X_set[y_set == j,
1],
                c = ListedColormap(('red', 'green'))(i),
label = j)
plt.title('SVM (Training set)')
plt.xlabel('Age')
plt.ylabel('Estimated Salary')
plt.legend()
plt.show()

#Visualising the Test set results
from matplotlib.colors import ListedColormap
X_set, y_set = X_test, y_test
X1, X2 = np.meshgrid(np.arange(start = X_set[:, 0].min()
- 1, stop = X_set[:, 0].max() + 1, step = 0.01),
                     np.arange(start = X_set[:, 1].min()
- 1, stop = X_set[:, 1].max() + 1, step = 0.01))
plt.contourf(X1, X2,
classifier.predict(np.array([X1.ravel(),
X2.ravel()]).T).reshape(X1.shape),
             alpha = 0.75, cmap = ListedColormap(('red',
'green')))
plt.xlim(X1.min(), X1.max())
plt.ylim(X2.min(), X2.max())
for i, j in enumerate(np.unique(y_set)):
    plt.scatter(X_set[y_set == j, 0], X_set[y_set == j,
1],
                c = ListedColormap(('red', 'green'))(i),
label = j)
plt.title('SVM (Test set)')
plt.xlabel('Age')
plt.ylabel('Estimated Salary')
plt.legend()
plt.show()
```

```
[66  2]
 [ 8 24]]
          precision    recall  f1-score   support

       0       0.89      0.97      0.93        68
       1       0.92      0.75      0.83        32
```

```
    accuracy                           0.90       100
   macro avg       0.91      0.86      0.88       100
weighted avg       0.90      0.90      0.90       100
```




SVM (Test set)
Estimated Salary
Age
0
1
3
2
1
0
−1
−2
−2
−1
0
1
2
3