pract-svm

June 7, 2023

[1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
```

[2]:
```
data=pd.read_csv('Social_Network_Ads.csv')
```

[3]:
```
print("Descriptive statistics:\n",data.describe())
```

```
Descriptive statistics:
                Age  EstimatedSalary   Purchased
count  400.000000       400.000000  400.000000
mean    37.655000     69742.500000    0.357500
std     10.482877     34096.960282    0.479864
min     18.000000     15000.000000    0.000000
25%     29.750000     43000.000000    0.000000
50%     37.000000     70000.000000    0.000000
75%     46.000000     88000.000000    1.000000
max     60.000000    150000.000000    1.000000
```

[4]:
```
x=data[['Age','EstimatedSalary']]
y=data['Purchased']
```

[5]:
```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.
↪20,random_state=2)
```

[6]:
```
model=SVC(kernel='linear')
model.fit(x_train,y_train)
```

[6]:
```
SVC(kernel='linear')
```

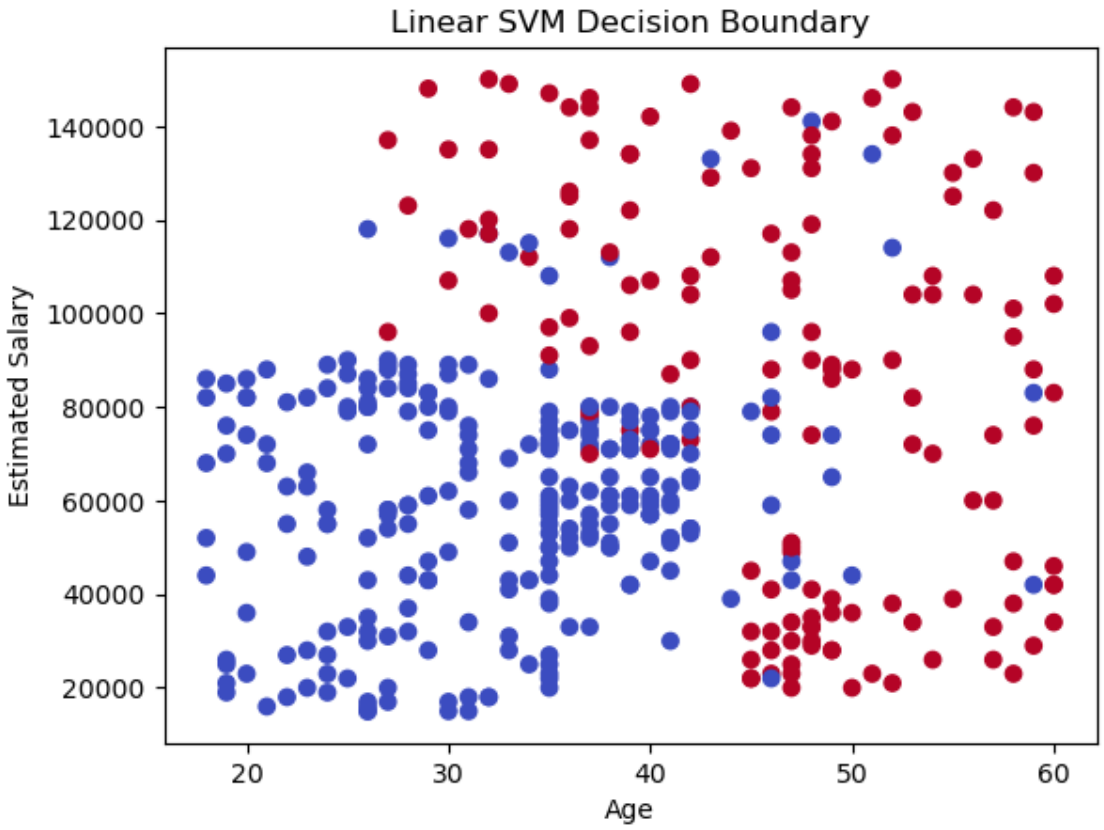
[9]:
```
x1_min,x1_max=x['Age'].min()-1,x['Age'].max()+1
x2_min,x2_max=x['EstimatedSalary'].min()-1,x['EstimatedSalary'].max()+1
xx1,xx2= np.meshgrid(np.arange(x1_min,x1_max),np.arange(x2_min,x2_max))
```

[10]:
```
z=model.predict(np.c_[xx1.ravel(),xx2.ravel()])
z=z.reshape(xx1.shape)
```

```
C:\Users\pksef\anaconda3\lib\site-packages\sklearn\base.py:450: UserWarning: X
does not have valid feature names, but SVC was fitted with feature names
  warnings.warn(
```

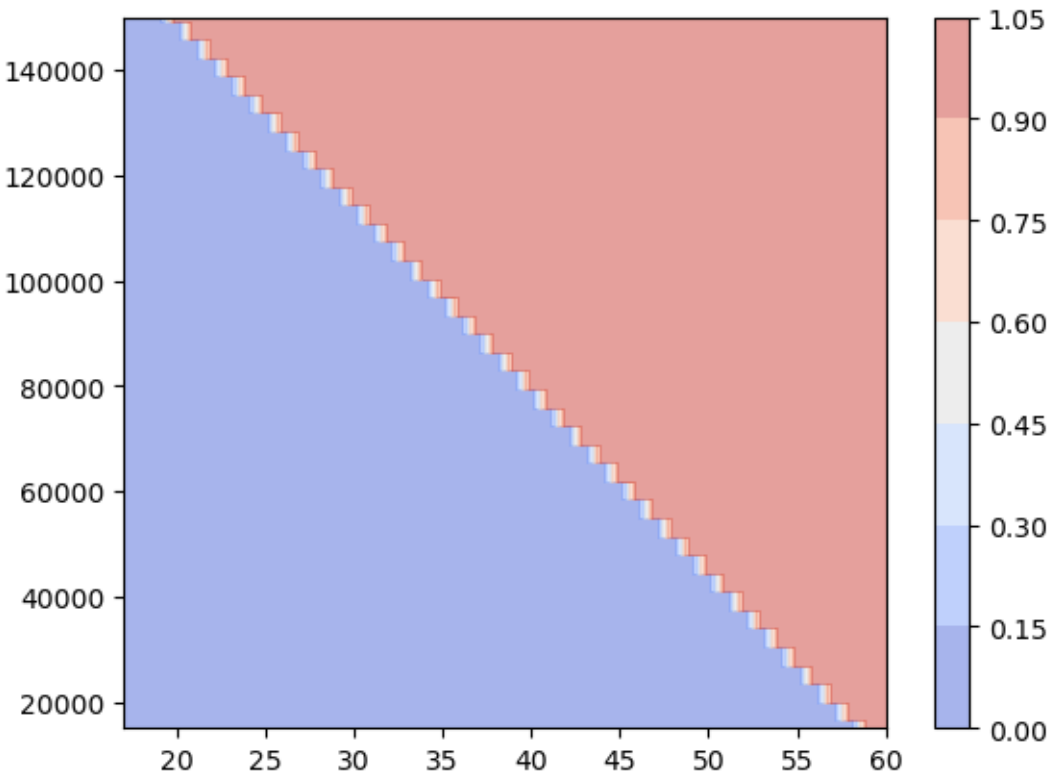
[12]:
```
plt.scatter(x['Age'], x['EstimatedSalary'], c=y, cmap='coolwarm')
plt.xlabel('Age')
plt.ylabel('Estimated Salary')
plt.title('Linear SVM Decision Boundary')
```

[12]:
```
Text(0.5, 1.0, 'Linear SVM Decision Boundary')
```



[14]:
```
plt.contourf(xx1, xx2, z, alpha=0.5, cmap='coolwarm')
plt.colorbar()

plt.show()
```

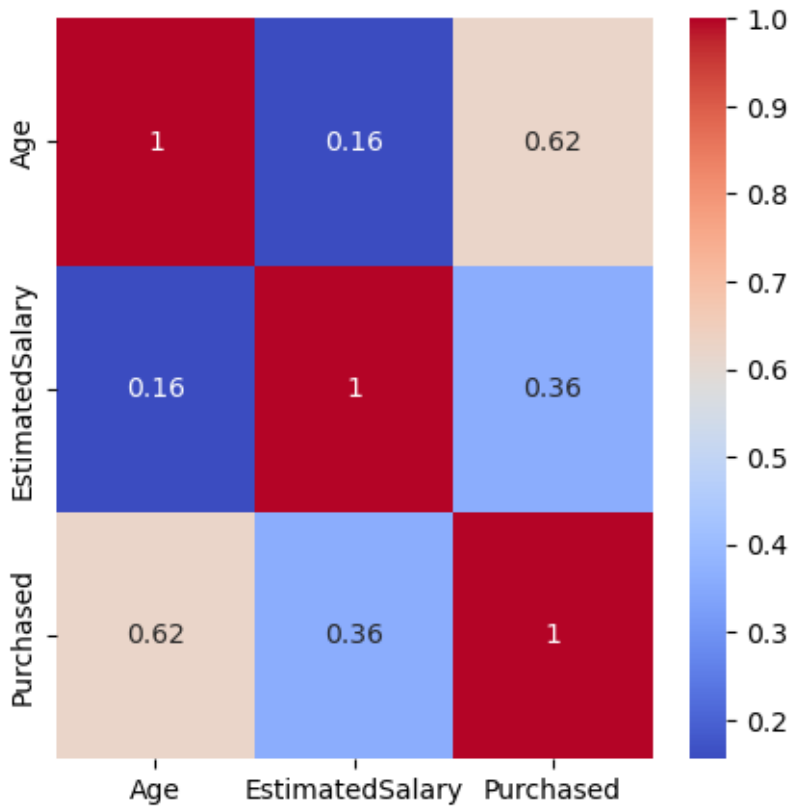


[15]:
```
corr_matrix=data.corr()
print(corr_matrix)
```

```
                     Age  EstimatedSalary  Purchased
Age             1.000000         0.155238   0.622454
EstimatedSalary 0.155238         1.000000   0.362083
Purchased       0.622454         0.362083   1.000000
```

[18]:
```
import seaborn as sns
plt.figure(figsize=(5,5))
sns.heatmap(corr_matrix,annot=True,cmap='coolwarm')
plt.show
```

[18]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```


Age
EstimatedSalary
Purchased
1
0.16
0.62
0.16
1
0.36
0.62
0.36
1
Age
EstimatedSalary
Purchased
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2

[ ]: