In [63]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import classification_report, confusion_matrix, accuracy_score
```

In [44]:
```
data=pd.read_csv(r"C:\Users\mayur\Social_Network_Ads.csv")
data.head()
```

Out[44]:

	Age	EstimatedSalary	Purchased
0	19	19000	0
1	35	20000	0
2	26	43000	0
3	27	57000	0
4	19	76000	0

In [45]:
```
data.describe()
```

Out[45]:

	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

In [46]:
```
data.shape
```

Out[46]:
```
(400, 3)
```

In [53]:
```
x=data.iloc[:,[0,1]]
y=data.iloc[:,2]
```

In [26]:
```
y.head()
```

Out[26]:
```
0    0
1    0
```

```
2    0
3    0
4    0
Name: Purchased, dtype: int64
```

In [54]:
```
x.head()
```

Out[54]:

	Age	EstimatedSalary
0	19	19000
1	35	20000
2	26	43000
3	27	57000
4	19	76000

In [55]:
```
corr=data.corr()
corr
```

Out[55]:

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

In [48]:
```
data.head()
```

Out[48]:

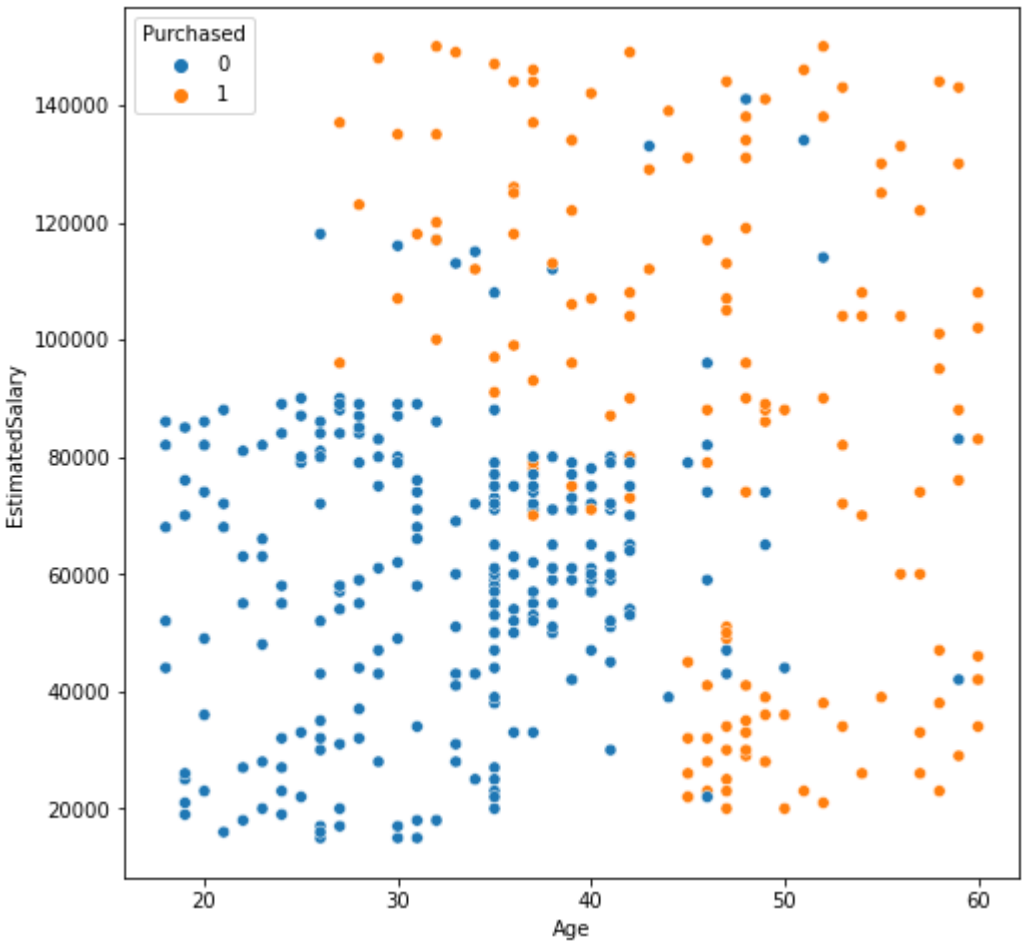
	Age	EstimatedSalary	Purchased
0	19	19000	0
1	35	20000	0
2	26	43000	0
3	27	57000	0
4	19	76000	0

In [49]:
```
sns.heatmap(corr,center=0)
```

Out[49]:
```
<AxesSubplot:>
```

In [50]:
```
plt.figure(figsize = (8,8))
sns.scatterplot(x = 'Age', y = 'EstimatedSalary',hue='Purchased', data = data)
```

Out[50]: <AxesSubplot:xlabel='Age', ylabel='EstimatedSalary'>



In [56]:
```
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x,y, test_size = 0.2,random_state=0
```

In [58]:
```
scaler=StandardScaler()
scaler.fit(x_train)
```

```
x_train=scaler.transform(x_train)
x_test=scaler.transform(x_test)
```

In [61]:
```
from sklearn.svm import SVC
classifier=SVC(kernel='linear',random_state=0)
classifier.fit(x_train,y_train)

y_pred=classifier.predict(x_test)
```

In [62]:
```
y_pred
```

Out[62]:
```
array([0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1,
       0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       1, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1,
       0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1], dtype=int64)
```

In [65]:
```
print('accuracy with linear',accuracy_score(y_test,y_pred))
```

```
accuracy with linear 0.9125
```

In [66]:
```
classifier1=SVC(kernel='rbf')
classifier1.fit(x_train,y_train)

y_pred1=classifier1.predict(x_test)
```

In [67]:
```
y_pred1
```

Out[67]:
```
array([0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 1,
       0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0,
       1, 0, 0, 1, 0, 1, 1, 0, 0, 1, 1, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1,
       0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 1], dtype=int64)
```

In [68]:
```
print('accuracy with rbf',accuracy_score(y_test,y_pred1))
```

```
accuracy with rbf 0.95
```

In [73]:
```
classifier2=SVC(kernel='rbf',gamma=16,C=10)
classifier2.fit(x_train,y_train)

y_pred2=classifier2.predict(x_test)
```

In [74]:
```
y_pred2
```

Out[74]:
```
array([0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0,
       1, 0, 0, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0,
       0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 1], dtype=int64)
```

In [75]:
```
print('accuracy with rbf(gamma,C)',accuracy_score(y_test,y_pred2))
```

```
accuracy with rbf(gamma,C) 0.8875
```

In [78]:
```
classifier3=SVC(kernel='poly',degree=4)
classifier3.fit(x_train,y_train)

y_pred3=classifier3.predict(x_test)
```

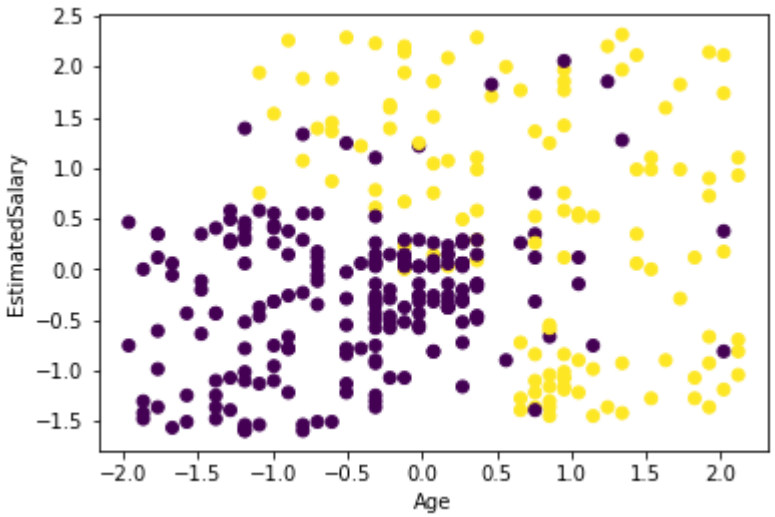
In [79]:
```
y_pred3
```

Out[79]:
```
array([0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1,
       0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0,
       0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 0], dtype=int64)
```

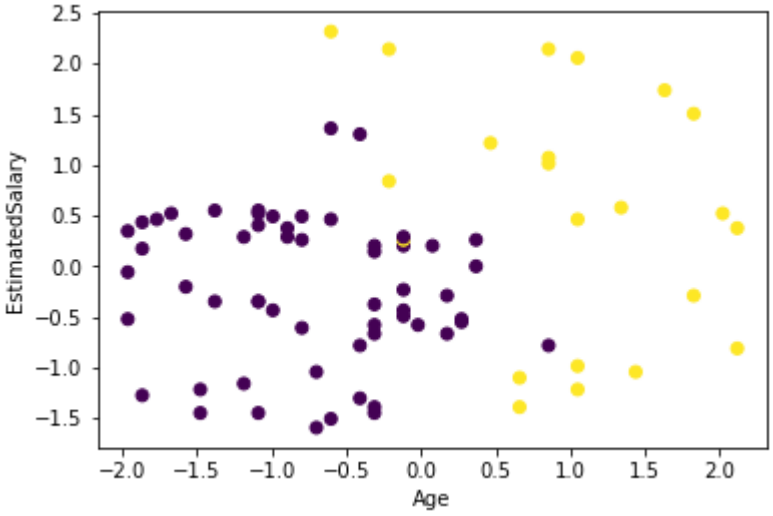
In [80]:
```
print('accuracy with poly',accuracy_score(y_test,y_pred3))
```

```
accuracy with poly 0.825
```

In [90]:
```
plt.scatter(x_train[:,0],x_train[:,1],c=y_train)
plt.xlabel('Age')
plt.ylabel('EstimatedSalary')
plt.show()
```

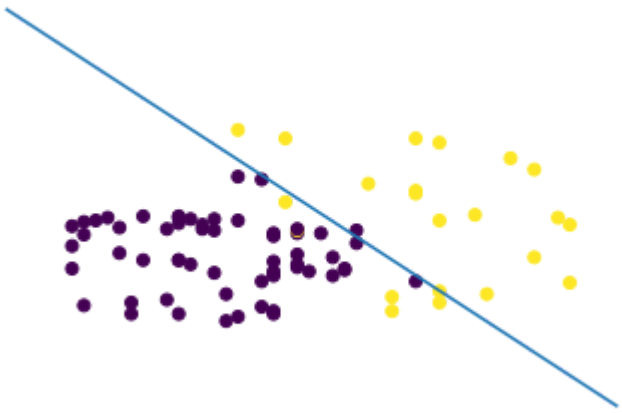


In [98]:
```
plt.scatter(x_test[:,0],x_test[:,1],c=y_test)
plt.xlabel('Age')
plt.ylabel('EstimatedSalary')
plt.show()
```



In [105…

```
plt.scatter(x_test[:,0],x_test[:,1],c=y_test)
plt.xlabel('Age')
plt.ylabel('EstimatedSalary')



w=classifier.coef_[0]
a= -w[0]/w[1]
xx=np.linspace(-2.5,2.5)
yy= a * xx - (classifier.intercept_[0])/w[1]



plt.plot(xx,yy)


plt.axis("off")
plt.show()
```



In [ ]: