

```
In [1]: import pandas as pd
data = pd.read_csv(r'data\classification.csv')
```

```
In [50]: data.head()
```

```
Out[50]:
```

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

```
In [52]: x = data.iloc[:, :-1].values
y = data.iloc[:, -1].values
```

```
In [54]: from sklearn.model_selection import train_test_split
```

```
In [56]: x_train, x_test, y_train, y_test = train_test_split(x, \
                                                            y, test_size=0.25)
```

```
In [58]: from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
```

```
In [60]: x_train = sc.fit_transform(x_train)
x_test = sc.transform(x_test)
```

```
In [62]: x_train
```

```
Out[62]: array([[ -1.3025315 ,  0.5252279 ],
 [ -1.10932535,  0.43965493],
 [ -1.10932535, -1.58557214],
 [ -1.3025315 , -0.35902617],
 [  0.4363239 ,  2.23668739],
 [  0.24311775, -0.33050184],
 [ -0.23989764,  2.17963874],
 [ -1.01272227, -1.52852349],
 [ -0.23989764, -0.44459914],
 [  0.91933929,  0.9816171 ],
 [ -1.10932535,  1.35243332],
 [ -0.62630996, -0.13083157],
 [  0.4363239 ,  0.26850898],
 [  0.91933929, -1.04360996],
 [ -1.01272227,  0.72489818],
 [  0.91933929,  1.2098117 ],
 [ -0.52970688,  1.83734684],
 [ -0.4331038 ,  1.2098117 ],
 [ -1.3025315 , -1.10065861],
 [ -1.10932535, -1.55704781],
 [ -1.10932535, -0.53017212],
 [ -1.88214997,  0.32555763],
 [  0.4363239 , -0.47312347],
 [ -1.01272227,  0.38260628],
 [ -0.52970688, -1.49999916],
 [  1.01594237,  0.55375223],
 [ -1.01272227, -0.35902617],
 [ -0.04669149, -0.01673427],
 [ -0.23989764, -1.38590186],
 [  0.04991159, -0.44459914],
 [ -0.23989764, -1.24328024],
 [  1.01594237, -1.07213429],
 [  0.33972082,  0.26850898],
 [  0.91933929,  2.09406577],
 [ -0.23989764, -0.90098834],
 [ -1.59234074,  0.49670358],
 [  0.14651467,  0.01179005],
 [ -1.20592843,  0.26850898],
 [ -0.72291304, -0.61574509],
 [  0.82273622, -0.33050184],
 [  0.82273622,  0.32555763],
 [ -1.7855469 ,  0.4111306 ],
 [ -1.88214997, -0.53017212],
 [ -0.04669149, -0.24492887],
 [  0.82273622, -1.35737754],
 [ -0.23989764, -0.15935589],
 [ -1.68894382, -0.61574509],
 [  0.72613314,  1.72324954],
 [ -0.23989764, -0.75836672],
 [  1.59556084,  0.95309277],
 [  0.4363239 ,  0.12588735],
 [ -0.4331038 , -0.30197752],
 [ -0.23989764, -1.35737754],
 [ -0.04669149, -0.38755049],
 [ -0.4331038 , -0.55869644],
 [  0.04991159, -0.55869644],
```

[-0.23989764, -0.92951267],
[-1.88214997, -0.75836672],
[-0.91611919, -0.33050184],
[1.20914853, -1.44295051],
[0.33972082, -0.21640454],
[-1.10932535, -1.01508564],
[-0.04669149, 0.12588735],
[-0.23989764, -0.30197752],
[0.04991159, 0.26850898],
[0.14651467, 0.01179005],
[-0.33650072, -0.78689104],
[0.14651467, 1.01014142],
[0.14651467, 0.12588735],
[1.01594237, 1.80882252],
[-1.39913458, -1.21475591],
[1.49895776, 0.04031438],
[-0.91611919, -0.75836672],
[-0.23989764, 0.182936],
[-1.88214997, -0.07378292],
[0.14651467, -0.81541537],
[0.91933929, -0.78689104],
[1.69216392, 1.69472522],
[0.14651467, 0.23998465],
[-0.23989764, -0.35902617],
[-1.01272227, 1.89439549],
[0.33972082, 0.23998465],
[-0.81951611, -0.27345319],
[0.91933929, -1.35737754],
[-0.14329457, -0.30197752],
[-0.04669149, 1.89439549],
[0.82273622, 0.23998465],
[-0.72291304, 1.03866575],
[0.04991159, -0.33050184],
[1.49895776, 2.06554144],
[1.98197315, -0.92951267],
[1.30575161, 2.15111442],
[0.53292698, 1.78029819],
[0.91933929, -0.55869644],
[-0.91611919, -0.95803699],
[-0.23989764, 0.12588735],
[-0.91611919, 0.46817925],
[-0.62630996, -1.49999916],
[1.11254545, -0.98656132],
[1.788767 , -0.30197752],
[-0.23989764, -0.67279374],
[-1.10932535, 0.26850898],
[0.82273622, 0.09736303],
[0.04991159, -0.15935589],
[-0.72291304, 1.83734684],
[0.82273622, 0.72489818],
[-0.23989764, -1.44295051],
[-0.72291304, 0.46817925],
[-1.01272227, 0.5252279],
[0.33972082, 0.01179005],
[-0.23989764, -0.58722077],
[-0.52970688, 1.40948197],

[0.91933929, -0.67279374],
[-0.04669149, 0.23998465],
[0.4363239 , 0.95309277],
[0.04991159, 1.18128737],
[1.01594237, 1.92291982],
[-0.14329457, -0.53017212],
[1.01594237, -1.01508564],
[0.14651467, 1.80882252],
[-1.7855469 , -0.01673427],
[-1.88214997, 0.43965493],
[0.33972082, -0.72984239],
[1.88537008, 0.09736303],
[-1.10932535, -1.58557214],
[0.53292698, 1.66620089],
[-1.01272227, -0.38755049],
[1.11254545, 0.09736303],
[-1.68894382, -0.98656132],
[1.49895776, 0.95309277],
[-1.49573766, -1.49999916],
[-0.23989764, 0.0688387],
[-0.14329457, -1.07213429],
[1.20914853, 0.49670358],
[-1.10932535, -0.78689104],
[-1.20592843, 0.23998465],
[-0.62630996, 0.09736303],
[-0.33650072, 1.26686035],
[-1.68894382, -1.35737754],
[-1.20592843, -1.38590186],
[-1.10932535, -1.10065861],
[-1.39913458, -0.21640454],
[-0.72291304, -1.58557214],
[0.72613314, -0.72984239],
[0.53292698, 1.18128737],
[-0.23989764, 0.04031438],
[2.17517931, 0.89604412],
[1.40235469, 2.26521172],
[1.59556084, 1.06719007],
[-1.59234074, -1.55704781],
[0.72613314, -1.38590186],
[1.11254545, 0.49670358],
[1.01594237, 1.38095765],
[1.788767 , 0.95309277],
[1.20914853, -0.75836672],
[-0.81951611, -0.67279374],
[-0.04669149, -0.53017212],
[0.33972082, 0.46817925],
[-0.62630996, -1.58557214],
[2.07857623, -1.18623159],
[-1.39913458, 0.32555763],
[-0.81951611, 2.20816307],
[0.82273622, 0.49670358],
[-0.04669149, 0.182936],
[0.72613314, 0.23998465],
[-0.33650072, 1.18128737],
[2.07857623, 0.15441168],
[-0.33650072, -0.78689104],

[2.17517931, -0.81541537],
[0.14651467, -0.27345319],
[0.24311775, -0.38755049],
[1.01594237, -1.18623159],
[-1.68894382, 0.32555763],
[1.88537008, -1.27180456],
[0.24311775, -0.30197752],
[-0.04669149, 0.21146033],
[-1.3025315 , -1.35737754],
[-0.14329457, 0.81047115],
[1.01594237, -0.84393969],
[1.40235469, -0.92951267],
[1.40235469, 0.55375223],
[-0.23989764, 0.04031438],
[-1.01272227, -1.44295051],
[0.91933929, -0.58722077],
[-1.01272227, 0.49670358],
[0.4363239 , -0.01673427],
[0.24311775, 2.03701712],
[-0.4331038 , -1.21475591],
[0.14651467, 1.80882252],
[-0.14329457, 0.12588735],
[-0.91611919, 0.5252279],
[-0.04669149, 0.26850898],
[1.98197315, 0.8675198],
[-0.33650072, -1.30032889],
[-0.33650072, 0.04031438],
[-0.91611919, 0.23998465],
[-1.3025315 , -0.44459914],
[-0.4331038 , -1.12918294],
[-0.52970688, 2.26521172],
[-0.04669149, 0.01179005],
[1.788767 , 1.78029819],
[0.82273622, -1.10065861],
[-0.81951611, -1.21475591],
[-0.14329457, 1.5521036],
[0.4363239 , 0.23998465],
[0.14651467, -0.81541537],
[0.33972082, -0.33050184],
[0.04991159, -0.27345319],
[2.07857623, 0.35408195],
[-1.3025315 , -1.47147484],
[-0.23989764, 0.49670358],
[-1.10932535, 0.38260628],
[0.24311775, -0.38755049],
[1.59556084, -1.27180456],
[-0.81951611, 0.26850898],
[2.17517931, 0.35408195],
[0.72613314, -1.10065861],
[-0.23989764, 0.58227655],
[-0.04669149, -0.44459914],
[1.98197315, 2.09406577],
[0.04991159, 1.2098117],
[-0.91611919, 0.4111306],
[0.14651467, -0.33050184],
[0.33972082, -0.55869644],

[-1.01272227, -0.47312347],
[-1.68894382, 0.09736303],
[-1.7855469 , -1.30032889],
[2.07857623, 0.49670358],
[-1.3025315 , -1.24328024],
[0.24311775, 0.04031438],
[-0.04669149, -1.07213429],
[-1.7855469 , -1.41442619],
[-1.59234074, -0.07378292],
[-0.91611919, 1.49505495],
[-0.14329457, 1.35243332],
[-0.4331038 , -0.84393969],
[-0.14329457, 2.09406577],
[0.91933929, -1.15770726],
[1.01594237, 1.72324954],
[-1.68894382, 0.32555763],
[2.17517931, 1.06719007],
[1.30575161, 1.80882252],
[-0.72291304, 0.23998465],
[0.4363239 , 0.55375223],
[-0.52970688, 0.43965493],
[-1.01272227, -0.35902617],
[0.4363239 , 0.26850898],
[0.04991159, 0.01179005],
[-0.81951611, 0.35408195],
[1.40235469, 1.92291982],
[-1.49573766, -0.44459914],
[-1.20592843, -1.07213429],
[0.4363239 , -0.50164779],
[0.33972082, -0.53017212],
[-1.39913458, -1.44295051],
[0.24311775, 0.01179005],
[2.07857623, 2.06554144],
[-1.39913458, -0.13083157],
[1.01594237, -1.07213429],
[0.14651467, 0.0688387],
[0.14651467, 1.46653062],
[0.33972082, -1.15770726],
[-0.23989764, 1.06719007],
[1.59556084, -0.01673427],
[0.82273622, -1.21475591],
[-0.04669149, 2.09406577],
[1.69216392, -0.90098834],
[-0.04669149, 2.15111442],
[-0.81951611, 0.35408195],
[-0.62630996, 1.35243332],
[0.24311775, 0.12588735],
[1.11254545, -1.21475591],
[0.04991159, -0.58722077],
[1.88537008, -0.30197752],
[0.91933929, -0.61574509],
[0.72613314, -1.27180456],
[-0.23989764, -0.27345319],
[0.33972082, 0.04031438],
[-0.62630996, 0.15441168],
[-0.14329457, 1.58062792],

```

[-0.23989764,  0.01179005],
[ 0.82273622, -0.84393969],
[ 0.24311775, -0.15935589],
[-1.10932535, -1.52852349],
[ 1.98197315,  0.69637385],
[ 1.40235469,  1.23833602],
[ 0.82273622, -1.38590186],
[-0.81951611, -0.78689104],
[-0.91611919,  0.38260628],
[-0.72291304,  1.29538467],
[ 1.11254545, -0.90098834],
[-0.04669149,  0.26850898],
[-0.04669149,  0.04031438],
[-0.72291304, -0.24492887],
[ 0.4363239 , -0.47312347],
[-0.04669149,  0.09736303],
[-1.49573766,  0.2970333 ],
[ 0.72613314, -1.38590186],
[-0.52970688, -1.49999916],
[ 1.11254545,  0.5252279 ]]

```

```

In [64]: from sklearn.linear_model import LogisticRegression
         cls = LogisticRegression()

```

```

In [ ]:

```

```

In [67]: cls.fit(x_train,y_train)

```

```

Out[67]: LogisticRegression
         LogisticRegression()

```

```

In [69]: y_pred = cls.predict(x_test)

```

```

In [71]: y_pred

```

```

Out[71]: array([0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0,
                1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0,
                0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0,
                1, 1, 0, 0, 0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 1, 0, 0, 0,
                0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 1], dtype=int64)

```

```

In [78]: from sklearn.metrics import confusion_matrix, accuracy_score

```

```

In [75]: confusion_matrix(y_test,y_pred)

```

```

Out[75]: array([[63,  3],
                [ 9, 25]], dtype=int64)

```

```

In [80]: accuracy_score(y_test,y_pred)

```

```

Out[80]: 0.88

```

