Assignment 2

MAHENDRA ENGINEERING COLLEGES FOR WOMEN

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CLASS:4 YEAR ECE

SUBJECT:IBM

REGISTER NUMBER:611419106044

```
1 0 1 1 1 2 5 4 2 . 5 8 0
2 1 0 1 1 3 9 3 1 . 5 7 1
3 0 0 9 3 8 2 6 . 6 3 0
4 1 1 7 9 0 8 4 . 1 0 0
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 11 columns):
# Column Non-Null Count Dtype
--- ------ -------------- -----
0 CreditScore 10000 non-null int64
1 Geography 10000 non-null object
2 Gender 10000 non-null object
3 Age 10000 non-null int64
4 Tenure 10000 non-null int64
5 Balance 10000 non-null float64
6 NumOfProducts 10000 non-null int64
7 HasCrCard 10000 non-null int64
8 IsActiveMember 10000 non-null int64
9 EstimatedSalary 10000 non-null float64
10 Exited 10000 non-null int64
dtypes: float64(2), int64(7), object(2)
memory usage: 859.5+ KB
```

```
df["Geography"].unique()
```

```
array(['France', 'Spain', 'Germany'], dtype=object)
```

```
df["Gender"].unique()
```

```
array(['Female', 'Male'], dtype=object)
```

```
geo=pd.get_dummies(df["Geography"],drop_first=False)
```

```
geo.head()
```

```
France Germany Spain
0 1 0 0
1 0 0 1
2 1 0 0
3 1 0 0
4 0 0 1
```

```
gen=pd.get_dummies(df["Gender"],drop_first=False)
```

```
Gender Female Male
0 1 0
1 1 0
2 1 0
3 1 0
4 1 0
```

```
df=pd.concat([df,geo,gen],axis=1)
```

```
df.head()
```

```
CreditScore Geography Gender Age Tenure Balance
```

0 619 France Female 42 2 0.00
1
1 608 Spain Female 41 1 83807.86
1
2 502 France Female 42 8 159660.80
3
3 699 France Female 39 1 0.00
2
4 850 Spain Female 43 2 125510.82
1
... ...
...
9995 771 France Male 39 5 0.00
2
9996 516 France Male 35 10 57369.61
1
9997 709 France Female 36 7 0.00
1
9998 772 Germany Male 42 3 75075.31
2
9999 792 France Female 28 4 130142.79
1

HasCrCard IsActiveMember EstimatedSalary Exited France
Germany \
0 1 1 101348.88 1 1
0
1 0 1 112542.58 0 0
0
2 1 0 113931.57 1 1
0
3 0 0 93826.63 0 1
0
4 1 1 79084.10 0 0
0
... ...
...
9995 1 0 96270.64 0 1
0
9996 1 1 101699.77 0 1
0
9997 0 1 42085.58 1 1
0
9998 1 0 92888.52 1 0
1
9999 1 0 38190.78 0 1
0

Spain Female Male
0 0 1 0

```
1110
2010
3010
4110
……….
9995001
9996001
9997010
9998001
9999010

[10000 rows x 16 columns]
```

```
df.drop(["Geography","Gender"],axis=1,inplace=True)

df.head()

CreditScore Age Tenure Balance NumOfProducts HasCrCard \
0 619 42 2 0.00 1 1
1 608 41 1 83807.86 1 0
2 502 42 8 159660.80 3 1
3 699 39 1 0.00 2 0
4 850 43 2 125510.82 1 1

IsActiveMember EstimatedSalary Exited France Germany Spain
Female \
0 1 101348.88 1 1 0 0
1
1 1 112542.58 0 0 0 1
1
2 0 113931.57 1 1 0 0
1
3 0 93826.63 0 1 0 0
1
4 1 79084.10 0 0 0 1
1

Male
0 0
1 0
2 0
3 0
4 0

x=df.drop('Exited',axis=1)

x

CreditScore Age Tenure Balance NumOfProducts HasCrCard \
0 619 42 2 0.00 1 1
1 608 41 1 83807.86 1 0
```

```
2 502 42 8 159660.80 3 1
3 699 39 1 0.00 2 0
4 850 43 2 125510.82 1 1
... ... ... ... ... ... ... ...
9995 771 39 5 0.00 2 1
9996 516 35 10 57369.61 1 1
9997 709 36 7 0.00 1 0
9998 772 42 3 75075.31 2 1
9999 792 28 4 130142.79 1 1

IsActiveMember EstimatedSalary France Germany Spain Female
Male
0 1 101348.88 1 0 0 1
0
1 1 112542.58 0 0 1 1
0
2 0 113931.57 1 0 0 1
0
3 0 93826.63 1 0 0 1
0
4 1 79084.10 0 0 1 1
0
... ... ... ... ... ... ... ...
...
9995 0 96270.64 1 0 0 0
1
9996 1 101699.77 1 0 0 0
1
9997 1 42085.58 1 0 0 1
0
9998 0 92888.52 0 1 0 0
1
9999 0 38190.78 1 0 0 1
0

[10000 rows x 13 columns]

y=df['Exited']

y

0 1
1 0
2 1
3 0
4 0
..
9995 0
9996 0
9997 1
9998 1
```

```
9999 0
Name: Exited, Length: 10000, dtype: int64
```

```
df.shape
```

```
(10000, 14)
```

```
x.shape
```

```
(10000, 13)
```

```
y.shape
```

```
(10000,)
```

```
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)
```

```
x_train.shape
```

```
(8000, 13)
```

```
x_test.shape
```

```
(2000, 13)
```

```
y_test.shape
```

```
(2000,)
```

```
from sklearn.preprocessing import StandardScaler
```

```
sc = StandardScaler()
```

```
x_train = sc.fit_transform(x_train)
```

```
x_train
```

```
array([[ 0.16958176, -0.46460796, 0.00666099, ..., 1.74309049,
1.09168714, -1.09168714],
[-2.30455945, 0.30102557, -1.37744033, ..., -0.57369368,
-0.91601335, 0.91601335],
[-1.19119591, -0.94312892, -1.031415 , ..., -0.57369368,
1.09168714, -1.09168714],
...,
[ 0.9015152 , -0.36890377, 0.00666099, ..., -0.57369368,
-0.91601335, 0.91601335],
[-0.62420521, -0.08179119, 1.39076231, ..., 1.74309049,
1.09168714, -1.09168714],
[-0.28401079, 0.87525072, -1.37744033, ..., -0.57369368,
1.09168714, -1.09168714]])
```

```
x_test = sc.transform(x_test)
```

x_test

```
array([[-0.55204276, -0.36890377,  1.04473698, ..., -0.57369368,
         1.09168714, -1.09168714],
       [-1.31490297,  0.10961719, -1.031415  , ..., -0.57369368,
         1.09168714, -1.09168714],
       [ 0.57162971,  0.30102557,  1.04473698, ...,  1.74309049,
         1.09168714, -1.09168714],
       ...,
       [-0.74791227, -0.27319958, -1.37744033, ...,  1.74309049,
        -0.91601335,  0.91601335],
       [-0.00566991, -0.46460796, -0.33936434, ..., -0.57369368,
        -0.91601335,  0.91601335],
       [-0.79945688, -0.84742473,  1.04473698, ..., -0.57369368,
        -0.91601335,  0.91601335]])
```