```
import numpy as np
import pandas as pd
df=pd.read_csv('/content/Iris.csv')
df
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

```
df.head()
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

```
df.tail()
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

```
df.shape
```

```
(150, 6)
```

```
df.dtypes
```

```
Id                int64
SepalLengthCm    float64
SepalWidthCm     float64
PetalLengthCm    float64
PetalWidthCm     float64
Species           object
dtype: object
```

```
df=df.drop(['Id'],axis=1)
```

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica

```
df.isna().sum()
```

```
SepalLengthCm    0
SepalWidthCm     0
PetalLengthCm    0
PetalWidthCm     0
Species          0
dtype: int64
```

```
df.describe()
```

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.054000	3.758667	1.198667
std	0.828066	0.433594	1.764420	0.763161
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.350000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

Separating input and output samples

```
x=df.iloc[:,:-1].values
x
y=df.iloc[:,-1].values
y
```

```
array(['Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
```

```
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica'], dtype=object)
```

Training and testing data

```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.30,random_state=42)
```

```
x_train
```

```
           [6. , 2.7, 5.1, 1.6],
           [6.1, 2.6, 5.6, 1.4],
           [7.7, 3. , 6.1, 2.3],
           [5.5, 2.5, 4. , 1.3],
           [4.4, 2.9, 1.4, 0.2],
           [4.3, 3. , 1.1, 0.1],
           [6. , 2.2, 5. , 1.5],
           [7.2, 3.2, 6. , 1.8],
           [4.6, 3.1, 1.5, 0.2],
           [5.1, 3.5, 1.4, 0.3],
           [4.4, 3. , 1.3, 0.2],
           [6.3, 2.5, 4.9, 1.5],
           [6.3, 3.4, 5.6, 2.4],
           [4.6, 3.4, 1.4, 0.3],
           [6.8, 3. , 5.5, 2.1],
           [6.3, 3.3, 6. , 2.5],
           [4.7, 3.2, 1.3, 0.2],
           [6.1, 2.9, 4.7, 1.4],
           [6.5, 2.8, 4.6, 1.5],
           [6.2, 2.8, 4.8, 1.8],
           [7. , 3.2, 4.7, 1.4],
           [6.4, 3.2, 5.3, 2.3],
           [5.1, 3.8, 1.6, 0.2],
           [6.9, 3.1, 5.4, 2.1],
           [5.9, 3. , 4.2, 1.5],
           [6.5, 3. , 5.2, 2. ],
           [5.7, 2.6, 3.5, 1. ],
           [5.2, 2.7, 3.9, 1.4],
           [6.1, 3. , 4.6, 1.4],
           [4.5, 2.3, 1.3, 0.3],
           [6.6, 2.9, 4.6, 1.3],
           [5.5, 2.6, 4.4, 1.2],
           [5.3, 3.7, 1.5, 0.2],
           [5.6, 3. , 4.1, 1.3],
           [7.3, 2.9, 6.3, 1.8],
           [6.7, 3.3, 5.7, 2.1],
           [5.1, 3.7, 1.5, 0.4],
           [4.9, 2.4, 3.3, 1. ],
           [6.7, 3.3, 5.7, 2.5],
           [7.2, 3. , 5.8, 1.6],
           [4.9, 3.1, 1.5, 0.1],
           [6.7, 3.1, 5.6, 2.4],
           [4.9, 3. , 1.4, 0.2],
           [6.9, 3.1, 4.9, 1.5],
           [7.4, 2.8, 6.1, 1.9],
           [6.3, 2.9, 5.6, 1.8],
           [5.7, 2.8, 4.1, 1.3],
           [6.5, 3. , 5.5, 1.8],
           [6.3, 2.3, 4.4, 1.3],
           [6.4, 2.9, 4.3, 1.3],
           [5.6, 2.8, 4.9, 2. ],
           [5.9, 3. , 5.1, 1.8],
           [5.4, 3.4, 1.7, 0.2],
           [6.1, 2.8, 4. , 1.3],
           [4.9, 2.5, 4.5, 1.7],
           [5.8, 4. , 1.2, 0.2],
           [5.8, 2.6, 4. , 1.2],
           [7.1, 3. , 5.9, 2.1]])
```

```
x_test
```

```
array([[6.1, 2.8, 4.7, 1.2],
       [5.7, 3.8, 1.7, 0.3],
       [7.7, 2.6, 6.9, 2.3],
       [6. , 2.9, 4.5, 1.5],
       [6.8, 2.8, 4.8, 1.4],
       [5.4, 3.4, 1.5, 0.4],
```

```
       [5.6, 2.9, 3.6, 1.3],
       [6.9, 3.1, 5.1, 2.3],
       [6.2, 2.2, 4.5, 1.5],
       [5.8, 2.7, 3.9, 1.2],
       [6.5, 3.2, 5.1, 2. ],
       [4.8, 3. , 1.4, 0.1],
       [5.5, 3.5, 1.3, 0.2],
       [4.9, 3.1, 1.5, 0.1],
       [5.1, 3.8, 1.5, 0.3],
       [6.3, 3.3, 4.7, 1.6],
       [6.5, 3. , 5.8, 2.2],
       [5.6, 2.5, 3.9, 1.1],
       [5.7, 2.8, 4.5, 1.3],
       [6.4, 2.8, 5.6, 2.2],
       [4.7, 3.2, 1.6, 0.2],
       [6.1, 3. , 4.9, 1.8],
       [5. , 3.4, 1.6, 0.4],
       [6.4, 2.8, 5.6, 2.1],
       [7.9, 3.8, 6.4, 2. ],
       [6.7, 3. , 5.2, 2.3],
       [6.7, 2.5, 5.8, 1.8],
       [6.8, 3.2, 5.9, 2.3],
       [4.8, 3. , 1.4, 0.3],
       [4.8, 3.1, 1.6, 0.2],
       [4.6, 3.6, 1. , 0.2],
       [5.7, 4.4, 1.5, 0.4],
       [6.7, 3.1, 4.4, 1.4],
       [4.8, 3.4, 1.6, 0.2],
       [4.4, 3.2, 1.3, 0.2],
       [6.3, 2.5, 5. , 1.9],
       [6.4, 3.2, 4.5, 1.5],
       [5.2, 3.5, 1.5, 0.2],
       [5. , 3.6, 1.4, 0.2],
       [5.2, 4.1, 1.5, 0.1],
       [5.8, 2.7, 5.1, 1.9],
       [6. , 3.4, 4.5, 1.6],
       [6.7, 3.1, 4.7, 1.5],
       [5.4, 3.9, 1.3, 0.4],
       [5.4, 3.7, 1.5, 0.2]])
```

```
y_train
```

```
array(['Iris-versicolor', 'Iris-virginica', 'Iris-virginica',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-virginica', 'Iris-versicolor', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-versicolor', 'Iris-virginica', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-setosa',
       'Iris-virginica', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-setosa', 'Iris-versicolor', 'Iris-virginica', 'Iris-setosa',
       'Iris-setosa', 'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-virginica', 'Iris-setosa', 'Iris-setosa', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-virginica', 'Iris-virginica', 'Iris-versicolor',
       'Iris-setosa', 'Iris-setosa', 'Iris-virginica', 'Iris-virginica',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-versicolor',
       'Iris-virginica', 'Iris-setosa', 'Iris-virginica',
       'Iris-virginica', 'Iris-setosa', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-virginica', 'Iris-setosa', 'Iris-virginica',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-virginica',
       'Iris-setosa', 'Iris-versicolor', 'Iris-virginica',
       'Iris-virginica', 'Iris-setosa', 'Iris-virginica', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-virginica',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-virginica',
       'Iris-setosa', 'Iris-versicolor', 'Iris-virginica', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica'], dtype=object)
```

```
y_test
```

```
array(['Iris-versicolor', 'Iris-setosa', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-versicolor', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-virginica',
       'Iris-setosa', 'Iris-virginica', 'Iris-setosa', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
```

```
          'Iris-setosa', 'Iris-virginica', 'Iris-versicolor',
          'Iris-versicolor', 'Iris-setosa', 'Iris-setosa'], dtype=object)
```

Normalisation

```
from sklearn.preprocessing import StandardScaler
scaler=StandardScaler()
scaler.fit(x_train)
x_train=scaler.transform(x_train)
x_test=scaler.transform(x_test)
```

```
x_train
```

```
          [ 0.18948252, -0.73796609,  0.71771076,  0.4886798 ],
          [ 0.3100623 , -0.98011121,  1.00980236,  0.21861991],
          [ 2.23933883, -0.01153072,  1.30189395,  1.43388941],
          [-0.4134164 , -1.22225633,  0.07510927,  0.08358997],
          [-1.73979401, -0.25367584, -1.443767  , -1.40173942],
          [-1.8603738 , -0.01153072, -1.61902196, -1.53676936],
          [ 0.18948252, -1.9486917 ,  0.65929245,  0.35364985],
          [ 1.63643991,  0.47275953,  1.24347563,  0.75873969],
          [-1.49863445,  0.2306144 , -1.38534869, -1.40173942],
          [-0.89573553,  1.19919489, -1.443767  , -1.26670948],
          [-1.73979401, -0.01153072, -1.50218532, -1.40173942],
          [ 0.55122187, -1.22225633,  0.60087413,  0.35364985],
          [ 0.55122187,  0.95704977,  1.00980236,  1.56891935],
          [-1.49863445,  0.95704977, -1.443767  , -1.26670948],
          [ 1.15412078, -0.01153072,  0.95138404,  1.16382952],
          [ 0.55122187,  0.71490465,  1.24347563,  1.7039493 ],
          [-1.37805466,  0.47275953, -1.50218532, -1.40173942],
          [ 0.3100623 , -0.25367584,  0.48403749,  0.21861991],
          [ 0.79238143, -0.49582097,  0.42561917,  0.35364985],
          [ 0.43064208, -0.49582097,  0.54245581,  0.75873969],
          [ 1.39528035,  0.47275953,  0.48403749,  0.21861991],
          [ 0.67180165,  0.47275953,  0.8345474 ,  1.43388941],
          [-0.89573553,  1.92563026, -1.32693037, -1.40173942],
          [ 1.27470056,  0.2306144 ,  0.89296572,  1.16382952],
          [ 0.06890273, -0.01153072,  0.1919459 ,  0.35364985],
          [ 0.79238143, -0.01153072,  0.77612908,  1.02879957],
          [-0.17225683, -0.98011121, -0.21698232, -0.32149987],
          [-0.77515575, -0.73796609,  0.01669095,  0.21861991],
          [ 0.3100623 , -0.01153072,  0.42561917,  0.21861991],
          [-1.61921423, -1.70654658, -1.50218532, -1.26670948],
          [ 0.91296121, -0.25367584,  0.42561917,  0.08358997],
          [-0.4134164 , -0.98011121,  0.30878254, -0.05143998],
          [-0.65457597,  1.68348514, -1.38534869, -1.40173942],
          [-0.29283662, -0.01153072,  0.13352758,  0.08358997],
          [ 1.7570197 , -0.25367584,  1.41873058,  0.75873969],
          [ 1.033541  ,  0.71490465,  1.06822067,  1.16382952],
          [-0.89573553,  1.68348514, -1.38534869, -1.13167953],
          [-1.1368951 , -1.46440146, -0.33381896, -0.32149987],
          [ 1.033541  ,  0.71490465,  1.06822067,  1.7039493 ],
          [ 1.63643991, -0.01153072,  1.12663899,  0.4886798 ],
          [-1.1368951 ,  0.2306144 , -1.38534869, -1.53676936],
          [ 1.033541  ,  0.2306144 ,  1.00980236,  1.56891935],
          [-1.1368951 , -0.01153072, -1.443767  , -1.40173942],
          [ 1.27470056,  0.2306144 ,  0.60087413,  0.35364985],
          [ 1.87759948, -0.49582097,  1.30189395,  0.89376963],
          [ 0.55122187, -0.25367584,  1.00980236,  0.75873969],
          [-0.17225683, -0.49582097,  0.13352758,  0.08358997],
          [ 0.79238143, -0.01153072,  0.95138404,  0.75873969],
          [ 0.55122187, -1.70654658,  0.30878254,  0.08358997],
          [ 0.67180165, -0.25367584,  0.25036422,  0.08358997],
          [-0.29283662, -0.49582097,  0.60087413,  1.02879957],
          [ 0.06890273, -0.01153072,  0.71771076,  0.75873969],
          [-0.53399618,  0.95704977, -1.26851205, -1.40173942],
          [ 0.3100623 , -0.49582097,  0.07510927,  0.08358997],
          [-1.1368951 , -1.22225633,  0.36720086,  0.62370974],
          [-0.05167705,  2.40992051, -1.56060364, -1.40173942],
          [-0.05167705, -0.98011121,  0.07510927, -0.05143998],
          [ 1.51586013, -0.01153072,  1.18505731,  1.16382952]])
```

```
x_test
```

```
array([[ 0.3100623 , -0.49582097,  0.48403749, -0.05143998],
       [-0.17225683,  1.92563026, -1.26851205, -1.26670948],
       [ 2.23933883, -0.98011121,  1.76924049,  1.43388941],
       [ 0.18948252, -0.25367584,  0.36720086,  0.35364985],
       [ 1.15412078, -0.49582097,  0.54245581,  0.21861991],
       [-0.53399618,  0.95704977, -1.38534869, -1.13167953],
       [-0.29283662, -0.25367584, -0.15856401,  0.08358997],
       [ 1.27470056,  0.2306144 ,  0.71771076,  1.43388941],
       [ 0.43064208, -1.9486917 ,  0.36720086,  0.35364985],
       [-0.05167705, -0.73796609,  0.01669095, -0.05143998],
       [ 0.79238143,  0.47275953,  0.71771076,  1.02879957],
```

```
       [-1.25747488, -0.01153072, -1.443767  , -1.53676936],
       [-0.4134164 ,  1.19919489, -1.50218532, -1.40173942],
       [-1.1368951 ,  0.2306144 , -1.38534869, -1.53676936],
       [-0.89573553,  1.92563026, -1.38534869, -1.26670948],
       [ 0.55122187,  0.71490465,  0.48403749,  0.4886798 ],
       [ 0.79238143, -0.01153072,  1.12663899,  1.29885946],
       [-0.29283662, -1.22225633,  0.01669095, -0.18646992],
       [-0.17225683, -0.49582097,  0.36720086,  0.08358997],
       [ 0.67180165, -0.49582097,  1.00980236,  1.29885946],
       [-1.37805466,  0.47275953, -1.32693037, -1.40173942],
       [ 0.3100623 , -0.01153072,  0.60087413,  0.75873969],
       [-1.01631531,  0.95704977, -1.32693037, -1.13167953],
       [ 0.67180165, -0.49582097,  1.00980236,  1.16382952],
       [ 2.4804984 ,  1.92563026,  1.4771489 ,  1.02879957],
       [ 1.033541  , -0.01153072,  0.77612908,  1.43388941],
       [ 1.033541  , -1.22225633,  1.12663899,  0.75873969],
       [ 1.15412078,  0.47275953,  1.18505731,  1.43388941],
       [-1.25747488, -0.01153072, -1.443767  , -1.26670948],
       [-1.25747488,  0.2306144 , -1.32693037, -1.40173942],
       [-1.49863445,  1.44134002, -1.67744028, -1.40173942],
       [-0.17225683,  3.378501  , -1.38534869, -1.13167953],
       [ 1.033541  ,  0.2306144 ,  0.30878254,  0.21861991],
       [-1.25747488,  0.95704977, -1.32693037, -1.40173942],
       [-1.73979401,  0.47275953, -1.50218532, -1.40173942],
       [ 0.55122187, -1.22225633,  0.65929245,  0.89376963],
       [ 0.67180165,  0.47275953,  0.36720086,  0.35364985],
       [-0.77515575,  1.19919489, -1.38534869, -1.40173942],
       [-1.01631531,  1.44134002, -1.443767  , -1.40173942],
       [-0.77515575,  2.65206563, -1.38534869, -1.53676936],
       [-0.05167705, -0.73796609,  0.71771076,  0.89376963],
       [ 0.18948252,  0.95704977,  0.36720086,  0.4886798 ],
       [ 1.033541  ,  0.2306144 ,  0.48403749,  0.35364985],
       [-0.53399618,  2.16777538, -1.50218532, -1.13167953],
       [-0.53399618,  1.68348514, -1.38534869, -1.40173942]])
```

Model creation

```
from sklearn.naive_bayes import GaussianNB
model=GaussianNB()
model.fit(x_train,y_train)
y_pred=model.predict(x_test)
y_pred
```

```
array(['Iris-versicolor', 'Iris-setosa', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-virginica', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-virginica',
       'Iris-setosa', 'Iris-virginica', 'Iris-setosa', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-setosa', 'Iris-setosa'], dtype='<U15')
```

```
y_test
```

```
array(['Iris-versicolor', 'Iris-setosa', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-virginica', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-versicolor', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-virginica',
       'Iris-setosa', 'Iris-virginica', 'Iris-setosa', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-virginica', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-setosa', 'Iris-setosa'], dtype=object)
```

Performance evaluation

```
from sklearn.metrics import confusion_matrix,accuracy_score
result=confusion_matrix(y_test,y_pred)
score=accuracy_score(y_test,y_pred)
result,score
```

```
(array([[19,  0,  0],
        [ 0, 12,  1],
```

```
       [ 0,  0, 13]]),
 0.9777777777777777)
```

```
from sklearn.metrics import classification_report
print(classification_report(y_test,y_pred))
```

```
                    precision    recall  f1-score   support

       Iris-setosa       1.00      1.00      1.00        19
   Iris-versicolor       1.00      0.92      0.96        13
    Iris-virginica       0.93      1.00      0.96        13

          accuracy                           0.98        45
         macro avg       0.98      0.97      0.97        45
      weighted avg       0.98      0.98      0.98        45
```