```
Part 1
    D
     # Decision Tree Classifier
     dclf = DecisionTreeClassifier()
     dclf.fit(X_train, y_train)
     dclfPrediction_1 = (dclf.predict(X_test)).round()
     dclf.fit(X_train_2, y_train_2)
     dclfPrediction_2 = (dclf.predict(X_test_2)).round()
     actual = np.concatenate([y_test, y_test_2]) # type: ignore
     predicted = (np.concatenate([dclfPrediction_1, dclfPrediction_2])).round()
     print(f"\nAccurace score: " + str(accuracy_score(actual, predicted)))
     print(f"\nConfusion matrix:\n " + str(confusion_matrix(actual, predicted)))
     print(f"\nFeature names:", names[0:4])
  ✓ 0.3s
                                                                        Python
    curace score: 0.9266666666666666
   Confusion matrix:
   [[50 0 0]
   [ 0 48 2]
     0 9 41]]
```

```
Part 3: Simulated Annealing
     data2_B = pd.DataFrame(data= np.c_[col1])
      new_features_8 = pd.concat([df, col1], axis=1)
      print('Shape of data =',new_features_8.shape)
      print('Total 8 features:',new_features_8.head())
R Python
... Shape of data = (150, 8)
   Total 8 features: sepal length (cm) sepal width (cm) petal length (cm) petal width
   (cm) \
                                  3.5
                                                                   0.2
                  4.9
                                  3.0
                                                   1.4
                                                                   0.2
                                                                   0.2
                                                   1.5
                  4.6
                                                                   0.2
                  5.0
                                  3.6
                                                   1.4
                                                                   0.2
      sepal length (cm) sepal width (cm) petal length (cm) petal width (cm)
                            0.480027
            -2.264703
                                             -0.127706
                                                             -0.024168
             -2.080961
                            -0.674134
                                             -0.234609
                                                             -0.103007
            -2.364229
                            -0.341908
                                             0.044201
                                                             -0.028377
            -2.299384
                            -0.597395
                                             0.091290
                                                             0.065956
                             0.646835
             -2.389842
                                              0.015738
                                                             0.035923
```

```
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.1277541660137893
Status: Accepted
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm)
              0.2
                       -0.024168
                                               5.1
\cap
-2.264703
1
              0.2
                       -0.103007
                                               4.9
-2.080961
              0.2
                       -0.028377
                                               4.7
-2.364229
              0.2
                      0.065956
                                               4.6
-2.299384
              0.2
                      0.035923
                                               5.0
-2.389842
```

```
petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm)
             1.4
                    -0.127706
                                            5.1
-2.264703
                                            4.9
             1.4 -0.234609
-2.080961
             1.3
                          0.044201
                                                4.7
2
    -2.364229
3
             1.5
                          0.091290
                                                4.6
    -2.299384
4
             1.4
                         0.015738
                                                5.0
    -2.389842
final shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 9 41]]
Pr[accept] = 1.0
Random uniform: 0.8359716064687146
Status: Accepted
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2
                    -0.024168
                                            3.5
0.480027
             0.2 -0.103007
                                            3.0
1
-0.674134
             0.2 -0.028377
                                            3.2
-0.341908
3
             0.2
                    0.065956
                                       3.1
-0.597395
                                       3.6
             0.2 0.035923
0.646835
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm) \
             0.2
                    -0.024168
                                            3.5
0.480027
             0.2
                   -0.103007
                                            3.0
1
-0.674134
             0.2 -0.028377
                                            3.2
-0.341908
```

```
3
            0.2 0.065956
                                       3.1
-0.597395
            0.2
                  0.035923
                                      3.6
0.646835
  sepal length (cm) sepal length (cm)
0
             5.1
                    -2.264703
1
             4.9
                     -2.080961
2
            4.7
                     -2.364229
3
            4.6
                     -2.299384
             5.0
                     -2.389842
final shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.7597559562512424
Status: Accepted
Features sepal width (cm) sepal width (cm) petal length
(cm) petal length (cm) \
0
            3.5 0.480027
                                           1.4
-0.127706
            3.0 -0.674134
1
                                           1.4
-0.234609
                                           1.3
2
             3.2
                    -0.341908
   0.044201
3
            3.1
                   -0.597395
                                           1.5
    0.091290
            3.6 0.646835
                                           1.4
4
    0.015738
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm)
            5.1 -2.264703
                                           5.1
-2.264703
            4.9 -2.080961
                                           4.9
-2.080961
            4.7 -2.364229
                                           4.7
-2.364229
```

3	4.6	-2.299384	4.6
-2.299384 4	5 0	-2.389842	5.0
-2.389842	3 . 0	2.303042	J. 0
final shape (1	50, 8)		

Accuracy= 0.9			
Confusion Matr [[50 0 0]	lX		
[0 48 2]			
[0 10 40]]			
Status: Improve	d		
Features sepa	l width (c	m) sepal width (cm)	sepal length
(cm) sepal le			
0	3.5	0.480027	5.1
-2.264703	2 0	0 674124	4 0
1 -2.080961	3.0	-0.674134	4.9
2.000901	3.2	-0.341908	4.7
-2.364229			
3	3.1	-0.597395	4.6
-2.299384			
4	3.6	0.646835	5.0
-2.389842			
petal width width (cm)	(cm) pet	al width (cm) petal	width (cm) petal
	0.2	-0.024168	0.2
-0.024168			
1	0.2	-0.103007	0.2
-0.103007			
2	0.2	-0.028377	0.2
-0.028377	0 0	0 065056	0 0
3 0.065956	0.2	0.065956	0.2
4	0.2	0.035923	0.2
0.035923			
shape (150, 8)			

Accuracy= 0.9 Confusion Matr			
[[50 0 0]	-		
-			

```
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 0.9432780711167889
Random uniform: 0.5320194695574249
Status: Accepted
Features petal width (cm) petal width (cm) petal length
(cm) petal length (cm) \
0
             0.2
                     -0.024168
                                              1.4
-0.127706
             0.2
                 -0.103007
                                              1.4
-0.234609
2
              0.2 -0.028377
                                              1.3
    0.044201
3
             0.2 0.065956
                                              1.5
    0.091290
             0.2
                   0.035923
4
                                              1.4
    0.015738
  sepal width (cm) sepal width (cm) sepal length (cm)
sepal length (cm)
                     0.480027
                                              5.1
             3.5
-2.264703
             3.0 -0.674134
                                              4.9
-2.080961
2
                                              4.7
             3.2 -0.341908
-2.364229
             3.1 -0.597395
                                              4.6
3
-2.299384
              3.6 0.646835
                                              5.0
-2.389842
final shape (150, 8)
******
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.6560881352745376
Status: Accepted
Features petal length (cm) petal length (cm) petal width
```

(cm) petal width (cm) \

0	1.4	-0.127706	0.2
-0.024168 1 -0.103007	1.4	-0.234609	0.2
-0.103007 2 -0.028377	1.3	0.044201	0.2
3 0.065956	1.5	0.091290	0.2
4 0.035923	1.4	0.015738	0.2
sepal len petal width	=	sepal length (cm)	petal width (cm)
0 -0.024168		-2.264703	0.2
1 -0.103007	4.9	-2.080961	0.2
2 -0.028377	4.7	-2.364229	0.2
3 0.065956	4.6	-2.299384	0.2
4 0.035923	5.0	-2.389842	0.2
final shape	(150, 8)		

Accuracy= 0 Confusion Ma [[50 0 0]		3333333	
[0 48 2] [0 11 39]]			
Status: Impro	ved		
Features pe	tal width	(cm) petal width	(cm) sepal width (cm)
sepal width	(cm) \		
0	0.2	-0.024168	3.5
0.480027			
1	0.2	-0.103007	3.0
-0.674134 2	0 2	0 000077	2 2
∠ -0.341908	0.2	-0.028377	3.2
3	0.2	0.065956	3.1
-0.597395	~ · ·		
4	0.2	0.035923	3.6
0.646835			

sepal width	_	oal width (cm) petal leng	gth (cm)
petar rength 0		0.480027	1.4
-0.127706	3.3	0.400027	1.1
1	3.0	-0.674134	1.4
-0.234609		0.07.1201	
2	3.2	-0.341908	1.3
0.044201			
3	3.1	-0.597395	1.5
0.091290			
4	3.6	0.646835	1.4
0.015738			
shape (150, 8)			
*****	*****		
Accuracy= 0.9		666666	
Confusion Mat	cix		
[[50 0 0]			
[0 45 5]			
[0 9 41]]			
C+a+11c • Tmnrotte	2d		
Status: Improve			
Features peta	al length ((cm) petal length (cm) p	etal width
Features petal will	al length (idth (cm)	\	
Features peta (cm) petal wi	al length (idth (cm)		oetal width
Features petal with 0 -0.024168	al length (idth (cm)	-0.127706	0.2
Features petal wide of the control o	al length (idth (cm) 1.4	\	
Features petal w: 0 -0.024168 1 -0.103007	al length (idth (cm) 1.4 1.4	-0.127706 -0.234609	0.2
Features petal wide (cm) petal wide 0	al length (idth (cm)	-0.127706	0.2
Features petal w: 0 -0.024168 1 -0.103007 2 -0.028377	al length (idth (cm) 1.4 1.4 1.3	-0.127706 -0.234609 0.044201	0.2 0.2 0.2
Features petal wide (cm) petal wide 0	al length (idth (cm) 1.4 1.4	-0.127706 -0.234609	0.2
Features petal wide (cm) petal	al length (idth (cm) 1.4 1.4 1.3	-0.127706 -0.234609 0.044201	0.2 0.2 0.2
Features petal with 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956	1.4 1.4 1.3 1.5	-0.127706 -0.234609 0.044201 0.091290	0.2 0.2 0.2
Features petal wide (cm) petal	1.4 1.4 1.3 1.5	-0.127706 -0.234609 0.044201 0.091290	0.2 0.2 0.2
Features petal with the control of t	1 length (idth (cm) 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290	0.2 0.2 0.2 0.2
Features petal with the control of t	1 length (idth (cm) 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738	0.2 0.2 0.2 0.2
Features petal width (cm) petal width (cm) petal width	1 length (idth (cm) 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738	0.2 0.2 0.2 0.2
Features petal width (cm) retal width (cm)	1 length (idth (cm) 1.4 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738 eal width (cm) sepal width	0.2 0.2 0.2 0.2 0.2 ch (cm) sepal
Features petal with (cm) petal width (cm) 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923	1 length (idth (cm) 1.4 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738 eal width (cm) sepal width	0.2 0.2 0.2 0.2 0.2 ch (cm) sepal
Features petal (cm) petal with (cm) petal width (cm) 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923	1 length (idth (cm) 1.4 1.4 1.3 1.5 1.4 1.4 1.4 1.3 1.5 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738 eal width (cm) sepal widt -0.024168	0.2 0.2 0.2 0.2 0.2 ch (cm) sepal 3.5
Features petal (cm) petal with (cm) petal with (cm) 0 0.480027 1	1 length (idth (cm) 1.4 1.4 1.3 1.5 1.4 1.4 1.4 1.3 1.5 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738 eal width (cm) sepal widt -0.024168	0.2 0.2 0.2 0.2 0.2 ch (cm) sepal 3.5

```
3
           0.2 0.065956
                                      3.1
-0.597395
           0.2 0.035923
                                      3.6
0.646835
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
            1.4
                    -0.127706
                                           1.4
-0.127706
1
            1.4 -0.234609
                                           1.4
-0.234609
2
            1.3
                         0.044201
                                               1.3
   0.044201
            1.5
                                               1.5
3
                         0.091290
    0.091290
            1.4
                        0.015738
                                               1.4
4
   0.015738
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
            5.1
                                           0.2
                   -2.264703
-0.024168
1
            4.9
                   -2.080961
                                           0.2
-0.103007
            4.7 -2.364229
                                           0.2
-0.028377
            4.6 -2.299384
                                           0.2
3
0.065956
            5.0 -2.389842
                                           0.2
0.035923
  sepal length (cm) sepal length (cm)
0
             5.1
                    -2.264703
            4.9
1
                     -2.080961
            4.7
2
                     -2.364229
3
            4.6
                    -2.299384
```

```
5.0 -2.389842
shape (150, 10)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 8 42]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
                                           0.2
0
            5.1
                    -2.264703
-0.024168
                                           0.2
            4.9 -2.080961
-0.103007
            4.7 -2.364229
                                           0.2
-0.028377
            4.6
                                           0.2
                    -2.299384
0.065956
             5.0
                   -2.389842
                                           0.2
0.035923
  sepal width (cm) sepal width (cm) petal length (cm)
petal length (cm) \
            3.5
                0.480027
                                           1.4
-0.127706
            3.0 -0.674134
1
                                           1.4
-0.234609
            3.2 -0.341908
2
                                           1.3
    0.044201
3
            3.1
                   -0.597395
                                           1.5
    0.091290
                 0.646835
            3.6
                                           1.4
4
    0.015738
  petal length (cm) petal length (cm)
0
             1.4
                     -0.127706
1
            1.4
                     -0.234609
2
            1.3
                         0.044201
3
            1.5
                         0.091290
            1.4
                         0.015738
shape (150, 10)
```

```
Accuracy= 0.91333333333333333
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
                                              0.2
              5.1
                     -2.264703
-0.024168
                                              0.2
              4.9 -2.080961
1
-0.103007
              4.7
                     -2.364229
                                              0.2
-0.028377
              4.6
                      -2.299384
                                              0.2
0.065956
4
              5.0
                    -2.389842
                                              0.2
0.035923
  petal length (cm) petal length (cm) sepal width (cm)
sepal width (cm)
              1.4 -0.127706
                                              3.5
0.480027
              1.4 -0.234609
                                              3.0
-0.674134
              1.3
                           0.044201
                                              3.2
-0.341908
              1.5
                                              3.1
                           0.091290
-0.597395
                           0.015738
              1.4
                                              3.6
0.646835
shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
```

(cm) sepal length (cm) \

0	1.4	-0.127706	5.1
-2.264703 1	1.4	-0.234609	4.9
-2.080961 2	1.3	0.044201	4.7
-2.364229 3	1.5	0.091290	4.6
-2.299384 4 -2.389842	1.4	0.015738	5.0
sepal width width (cm)	(cm) sep	al width (cm) petal	width (cm) petal
0 -0.024168	3.5	0.480027	0.2
1 -0.103007	3.0	-0.674134	0.2
2 -0.028377	3.2	-0.341908	0.2
3 0.065956	3.1	-0.597395	0.2
4 0.035923 shape (150, 8)	3.6	0.646835	0.2
*****	****		
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 47 3] [0 11 39]]		66666	
Status: Improve	d		
=	_	cm) sepal length (c	cm) petal length
(cm) petal le	=	-2.264703	1 <i>/</i> l
-0.127706	J.1	-2.204/03	1.4
1	4.9	-2.080961	1.4
-0.234609			
2	4.7	-2.364229	1.3
0.044201	4.6	-2.299384	1.5
0.091290	5.0	-2.389842	1.4
0.015738			

```
sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
            5.1 -2.264703
                                          0.2
-0.024168
            4.9
                                          0.2
                    -2.080961
-0.103007
            4.7
                   -2.364229
                                          0.2
2
-0.028377
            4.6 -2.299384
                                          0.2
0.065956
            5.0 -2.389842
                                          0.2
0.035923
  sepal width (cm) sepal width (cm)
                    0.480027
0
            3.5
1
            3.0
                     -0.674134
2
            3.2
                     -0.341908
3
            3.1
                     -0.597395
            3.6 0.646835
shape (150, 10)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal length
(cm) petal length (cm) \
0
            5.1
                    -2.264703
                                          1.4
-0.127706
            4.9 -2.080961
                                          1.4
-0.234609
            4.7 -2.364229
                                          1.3
2
    0.044201
            4.6 -2.299384
                                          1.5
3
    0.091290
            5.0 -2.389842
4
                                          1.4
   0.015738
```

sepal length (cm) sepal length (cm) petal width (cm)

petal width (cm)

0 024168	5.1	-2.264703	0.2
-0.024168 1	4.9	-2.080961	0.2
-0.103007 2	4.7	-2.364229	0.2
-0.028377			
3 0.065956	4.6	-2.299384	0.2
4	5.0	-2.389842	0.2
0.035923			
shape (150, 8)			
*****	*****		
Accuracy= 0.9		333333	
Confusion Mata	rix		
[0 48 2]			
[0 11 39]]			
Status: Improve			
=		cm) petal width (cm)	petal length
(cm) petal le		-0.024168	1.4
-0.127706	0.2	-0.024100	1.4
1	0.2	-0.103007	1.4
-0.234609			
2	0.2	-0.028377	1.3
0.044201	0.2	0.065956	1.5
0.091290	0.2	0.00000	1.0
4	0.2	0.035923	1.4
0.015738			
sepal width	n (cm) ser	oal width (cm) sepal	width (cm) sepal
width (cm) \	· , , _	· · · · · · · · · · · · · · · · · · ·	. , .
0	3.5	0.480027	3.5
0.480027 1	3.0	-0.674134	3.0
-0.674134	3.0	-0.074134	3.0
2	3.2	-0.341908	3.2
-0.341908			
3 -0.597395	3.1	-0.597395	3.1
-0.597395 4	3.6	0.646835	3.6
0.646835			-

```
petal width (cm) petal width (cm)
0
             0.2
                     -0.024168
1
             0.2
                      -0.103007
             0.2
2
                      -0.028377
3
             0.2
                      0.065956
             0.2
                     0.035923
shape (150, 10)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
             0.2
                     -0.024168
                                             5.1
-2.264703
             0.2
                     -0.103007
                                             4.9
-2.080961
                    -0.028377
                                             4.7
             0.2
-2.364229
3
             0.2 0.065956
                                             4.6
-2.299384
             0.2 0.035923
                                             5.0
-2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm) \
0
             3.5
                     0.480027
                                        0.2
-0.024168
                                             0.2
             3.0
                     -0.674134
-0.103007
                                             0.2
2
             3.2
                     -0.341908
-0.028377
             3.1
                                             0.2
                   -0.597395
0.065956
             3.6 0.646835
                                  0.2
0.035923
  petal length (cm) petal length (cm)
```

0

1.4

-0.127706

```
1.4 -0.234609
1
2
            1.3
                         0.044201
3
            1.5
                        0.091290
            1.4
                        0.015738
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
                   -2.264703
                                          0.2
            5.1
-0.024168
1
            4.9 -2.080961
                                          0.2
-0.103007
            4.7 -2.364229
                                          0.2
-0.028377
            4.6 -2.299384
                                          0.2
3
0.065956
            5.0 -2.389842
                                          0.2
0.035923
  sepal width (cm) sepal width (cm) petal length (cm)
petal length (cm) \
            3.5 0.480027
                                          1.4
-0.127706
1
            3.0
                  -0.674134
                                          1.4
-0.234609
            3.2 -0.341908
                                          1.3
   0.044201
3
            3.1 -0.597395
                                          1.5
   0.091290
            3.6 0.646835
4
                                          1.4
    0.015738
  petal width (cm) petal width (cm)
            0.2
                   -0.024168
0
            0.2
1
                    -0.103007
            0.2
2
                    -0.028377
```

0.065956

3

0.2

```
0.2 0.035923
shape (150, 10)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
0
            0.2
                   -0.024168
                                          5.1
-2.264703
            0.2 -0.103007
                                          4.9
-2.080961
            0.2
                  -0.028377
                                          4.7
-2.364229
            0.2
                                          4.6
                    0.065956
-2.299384
            0.2 0.035923
                                          5.0
-2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
            3.5 0.480027
                                      0.2
-0.024168
            3.0
                  -0.674134
                                          0.2
-0.103007
                  -0.341908
                                          0.2
2
            3.2
-0.028377
3
            3.1
                   -0.597395
                                          0.2
0.065956
            3.6 0.646835
                                      0.2
0.035923
shape (150, 8)
*****
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
```

Random uniform: 0.5286211996330776 Status: Accepted Features petal width (cm) petal width (cm) sepal length (cm) sepal length (cm) \ 5.1 Ω 0.2 -0.024168 -2.264703 0.2 -0.103007 4.9 1 -2.080961 0.2 -0.028377 4.7 -2.364229 0.2 0.065956 4.6 -2.299384 0.2 0.035923 5.0 -2.389842 petal length (cm) petal length (cm) sepal length (cm) sepal length (cm) 1.4 -0.127706 0 5.1 -2.264703 1.4 -0.234609 4.9 -2.080961 1.3 4.7 2 0.044201 -2.364229 1.5 0.091290 4.6 -2.299384 0.015738 1.4 5.0 -2.389842 final shape (150, 8) ****** Confusion Matrix [[50 0 0] [0 48 2] [0 9 41]] Status: Improved Features sepal length (cm) sepal length (cm) petal width (cm) petal width (cm) \ 5.1 -2.264703 0.2 -0.024168 4.9 -2.080961 0.2 1 -0.103007 4.7 -2.364229 0.2

-0.028377

			0 2
3	4.6	-2.299384	0.2
0.065956			
4	5.0	-2.389842	0.2
0.035923			
petal width	n (cm)	petal width (cm) se	epal length (cm)
sepal length			
0	0.2	-0.024168	5.1
-2.264703			
1	0.2	-0.103007	4.9
-2.080961			
2	0.2	-0.028377	4.7
-2.364229	0 0	0 0 5 - 5 - 5	
3	0.2	0.065956	4.6
-2.299384	0 0	0.005000	F 0
4	0.2	0.035923	5.0
-2.389842			
shape (150, 8)			
Confusion Mat	92	**	
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve	92 cix ed	n (cm) sepal width	(cm) petal length
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve	92 cix ed al width	n (cm) sepal width	(cm) petal length
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa	ed width	n (cm) sepal width	(cm) petal length 1.4
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa	ed width	n (cm) sepal width	_
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706	ed width	n (cm) sepal width	_
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706	ed al width ength (c	n (cm) sepal width cm) \	1.4
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609	ed al width ength (c	n (cm) sepal width cm) \ 0.480027	1.4
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201	ed al width ength (c 3.5	n (cm) sepal width cm) \	1.4
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201	ed al width ength (c 3.5	n (cm) sepal width cm) \	1.4
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201	ed al width ength (c 3.5 3.0 3.2 3.1	n (cm) sepal width cm) \	1.4 1.4 1.3 1.5
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201 3 0.091290	ed al width ength (c 3.5	n (cm) sepal width cm) \ 0.480027 -0.674134 -0.341908 -0.597395	1.4 1.4 1.3
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201 3	ed al width ength (c 3.5 3.0 3.2 3.1	n (cm) sepal width cm) \	1.4 1.4 1.3 1.5
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201 3 0.091290 4 0.015738	22 cix ed al width (co. 3.5 3.0 3.2 3.1 3.6	n (cm) sepal width cm) \ 0.480027 -0.674134 -0.341908 -0.597395 0.646835	1.4 1.4 1.3 1.5
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2 0.044201 3 0.091290 4 0.015738	22 cix ed al width (co. 3.5 3.0 3.2 3.1 3.6	n (cm) sepal width cm) \	1.4 1.4 1.3 1.5
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 49 1] [0 11 39]] Status:Improve Features sepa (cm) petal le 0 -0.127706 1 -0.234609 2	22 cix ed al width (c 3.5 3.0 3.2 3.1 3.6	n (cm) sepal width cm) \ 0.480027 -0.674134 -0.341908 -0.597395 0.646835	1.4 1.4 1.3 1.5

1	3.0	-0.6741	34	0.2
-0.103007 2 -0.028377	3.2	-0.3419	08	0.2
3 0.065956	3.1	-0.5973	95	0.2
4 0.035923 shape (150, 8)	3.6	0.64683	5 0.	. 2
_				
**************************************		33333		
Confusion Matr [[50 0 0] [0 48 2] [0 11 39]]	ix			
Status: Improve			- 1	
(cm) petal le	-	-	al length (cm)	petal length
0	5.1		03	1.4
-0.127706				
1	4.9	-2.0809	61	1.4
-0.234609	4 7	2 2642	2.0	1 2
2 0.044201	4.7	-2.36422	29	1.3
3	4.6	-2.2993	84	1.5
0.091290	5.0	-2.3898	12	1.4
0.015738	3.0	2.3090	12	1.4
petal lengt	=	tal leng	th (cm) petal	width (cm)
0	1.4	-0.1277	06	0.2
-0.024168				
1	1.4	-0.2346	09	0.2
-0.103007 2	1.3	0 (044201	0.2
-0.028377	1.3	0.1	J44201	0.2
3	1.5	0.0	091290	0.2
0.065956				
4	1.4	0.0	015738	0.2
0.035923				

petal width (cm) petal width (cm)

0 1 2 3	0.2		
4		0.035923	
shape (150, 10)			
211aps (100, 10)			
*****	****		
Accuracy= 0.91	133333333333	33333	
Confusion Matri			
[[50 0 0]			
[0 48 2]			
[0 11 39]]			
Status: Improved	ď		
-		n) petal width (cm) peta	al lenath
(cm) petal ler		-	~= =0119011
0	0.2		1.4
-0.127706			
1	0.2	-0.103007	1.4
-0.234609			
2	0.2	-0.028377	1.3
0.044201			
3	0.2	0.065956	1.5
0.091290			
4	0.2	0.035923	1.4
0.015738			
sepal length	n (cm) sep	oal length (cm) petal wid	dth (cm)
petal width (cr	_		
0	5.1	-2.264703	0.2
-0.024168			
1	4.9	-2.080961	0.2
-0.103007			
2	4.7	-2.364229	0.2
-0.028377			
3	4.6	-2.299384	0.2
0.065956			
4	5.0	-2.389842	0.2
0.035923			
shape (150, 8)			

Confusion Matrix

```
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
             3.5
                 0.480027
                                            5.1
-2.264703
             3.0 -0.674134
                                            4.9
-2.080961
             3.2
                    -0.341908
                                           4.7
-2.364229
                                           4.6
3
             3.1
                   -0.597395
-2.299384
             3.6 0.646835
                                           5.0
-2.389842
  petal width (cm) petal width (cm) petal length (cm)
petal length (cm)
             0.2 -0.024168
                                           1.4
-0.127706
             0.2
                    -0.103007
                                           1.4
1
-0.234609
             0.2
                    -0.028377
                                           1.3
    0.044201
             0.2
3
                   0.065956
                                           1.5
    0.091290
             0.2 0.035923
                                           1.4
4
    0.015738
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal length
(cm) petal length (cm) \
0
             5.1
                 -2.264703
                                           1.4
-0.127706
             4.9 -2.080961
                                           1.4
-0.234609
```

```
4.7 -2.364229
2
                                            1.3
    0.044201
             4.6
                    -2.299384
                                            1.5
3
    0.091290
             5.0 -2.389842
4
                                            1.4
    0.015738
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
             3.5 0.480027
                                        0.2
-0.024168
                   -0.674134
                                            0.2
             3.0
1
-0.103007
             3.2
                     -0.341908
                                            0.2
-0.028377
             3.1
                     -0.597395
                                            0.2
0.065956
4
             3.6 0.646835
                                      0.2
0.035923
shape (150, 8)
******
Accuracy= 0.91333333333333333
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal width (cm) petal width (cm) petal width (cm)
petal width (cm) \
                                            0.2
0
             0.2 -0.024168
-0.024168
             0.2
                   -0.103007
                                            0.2
-0.103007
             0.2
                   -0.028377
                                            0.2
2
-0.028377
             0.2 0.065956
                                        0.2
0.065956
             0.2 0.035923
                                        0.2
0.035923
  petal length (cm) petal length (cm) sepal length (cm)
```

sepal length (cm) \

```
1.4 -0.127706
                                        5.1
0
-2.264703
            1.4 -0.234609
                                        4.9
-2.080961
            1.3
                                            4.7
2
                       0.044201
   -2.364229
           1.5
                  0.091290
                                            4.6
3
   -2.299384
4
           1.4
                       0.015738
                                            5.0
   -2.389842
  sepal width (cm) sepal width (cm)
            3.5
0
                0.480027
            3.0
1
                    -0.674134
2
            3.2
                    -0.341908
3
            3.1
                   -0.597395
            3.6 0.646835
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
                  -0.127706
                                        5.1
            1.4
-2.264703
            1.4 -0.234609
1
                                        4.9
-2.080961
            1.3
                                            4.7
                 0.044201
   -2.364229
3
           1.5
                       0.091290
                                            4.6
   -2.299384
           1.4
                  0.015738
                                            5.0
4
   -2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
            3.5 0.480027
                                   0.2
-0.024168
```

1 -0.103007	3.0	-0.674134	0.2
2 -0.028377	3.2	-0.341908	0.2
3	3.1	-0.597395	0.2
0.065956 4 0.035923	3.6	0.646835	0.2
shape (150, 8)			

Accuracy= 0.9 Confusion Matr			
[[50 0 0] [0 45 5]			
[0 10 40]] Pr[accept]= 1.	0		
Random uniform		75260645406	
Status: Accepte			
		cm) petal length (c	m) petal length
(cm) petal le	=	-0.127706	1.4
-0.127706	T • 4	0.127700	Τ•4
1	1.4	-0.234609	1.4
-0.234609 2	1.3	0.044201	1.3
0.044201	1.5	0.091290	1.5
0.091290			
4 0.015738	1.4	0.015738	1.4
petal width	(cm) pet	al width (cm) petal	width (cm) petal
0 -0.024168	0.2	-0.024168	0.2
1	0.2	-0.103007	0.2
-0.103007 2	0.2	-0.028377	0.2
-0.028377 3	0.2	0.065956	0.2
0.065956 4 0.035923	0.2	0.035923	0.2

***** Confusion Matrix [[50 0 0] [0 48 2] [0 11 39]] Status: Improved Features sepal width (cm) sepal width (cm) petal width (cm) petal width (cm) \ 0.2 3.5 0.480027 -0.024168 0.2 3.0 -0.674134 -0.103007 3.2 -0.341908 0.2 2 -0.028377 3 3.1 -0.597395 0.2 0.065956 3.6 0.646835 0.2 0.035923 petal width (cm) petal width (cm) petal length (cm) petal length (cm) 0.2 -0.024168 1.4 0 -0.127706 0.2 -0.103007 1.4 -0.234609 0.2 1.3 -0.028377 0.044201 3 0.2 0.065956 1.5 0.091290 0.2 0.035923 1.4 4 0.015738 shape (150, 8) ***** Confusion Matrix [[50 0 0] [0 46 4]

final shape (150, 8)

[0 9 41]]
Status:Improved

Features sepa (cm) sepal wi	-	-	ength (cm)	sepal width
0 0.480027		-2.264703		3.5
1 -0.674134	4.9	-2.080961		3.0
2 -0.341908	4.7	-2.364229		3.2
3 -0.597395	4.6	-2.299384		3.1
4 0.646835	5.0	-2.389842		3.6
petal width sepal length (-	al width (cm	n) sepal le	ngth (cm)
0 -2.264703	0.2	-0.024168		5.1
1 -2.080961	0.2	-0.103007		4.9
2 -2.364229	0.2	-0.028377		4.7
3 -2.299384	0.2	0.065956		4.6
4 -2.389842 shape (150, 8)		0.035923		5.0

Accuracy= 0.9 Confusion Matr [[50 0 0] [0 48 2] [0 11 39]]	ix	33333		
Status:Improve Features peta		m) petal wi	.dth (cm) s	epal width (cm)
sepal width (c	m) \ 0.2	-0.024168		3.5
0.480027	0.2	-0.103007		3.0
-0.674134 2 -0.341908	0.2	-0.028377		3.2
3 -0.597395	0.2	0.065956	3.	1

```
0.2 0.035923
                                         3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
                                             1.4
             5.1
                     -2.264703
-0.127706
             4.9
                    -2.080961
                                             1.4
1
-0.234609
             4.7
                    -2.364229
                                             1.3
    0.044201
3
                    -2.299384
             4.6
                                             1.5
    0.091290
4
             5.0 -2.389842
                                             1.4
    0.015738
shape (150, 8)
******
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.07681915639551151
Status: Accepted
Features sepal length (cm) sepal length (cm) sepal length
(cm) sepal length (cm) \
                                             5.1
             5.1
                     -2.264703
-2.264703
1
             4.9
                    -2.080961
                                             4.9
-2.080961
             4.7
                    -2.364229
                                             4.7
-2.364229
             4.6
                    -2.299384
                                             4.6
3
-2.299384
             5.0 -2.389842
                                             5.0
-2.389842
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
             0.2 -0.024168
                                             3.5
0.480027
```

```
0.2 -0.103007
                                          3.0
1
-0.674134
            0.2
                    -0.028377
                                          3.2
-0.341908
            0.2 0.065956
3
                                      3.1
-0.597395
            0.2 0.035923
                                     3.6
0.646835
final shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) petal width (cm)
petal width (cm) \
            3.5 0.480027
                                      0.2
-0.024168
            3.0 -0.674134
                                          0.2
1
-0.103007
                                          0.2
            3.2
                    -0.341908
-0.028377
3
            3.1
                    -0.597395
                                          0.2
0.065956
            3.6 0.646835
                                      0.2
4
0.035923
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
            3.5 0.480027
                                      0.2
-0.024168
            3.0
                  -0.674134
                                          0.2
1
-0.103007
            3.2
                    -0.341908
                                          0.2
-0.028377
            3.1
                    -0.597395
                                          0.2
0.065956
            3.6 0.646835
                                      0.2
0.035923
```

shape (150, 8)

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal length
(cm) sepal length (cm) \
                                            5.1
             5.1
                   -2.264703
-2.264703
                                            4.9
             4.9 -2.080961
1
-2.080961
             4.7
                    -2.364229
                                            4.7
-2.364229
                    -2.299384
                                            4.6
             4.6
-2.299384
4
             5.0 -2.389842
                                            5.0
-2.389842
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm)
             0.2 -0.024168
                                            0.2
-0.024168
                                            0.2
1
             0.2 -0.103007
-0.103007
             0.2
                    -0.028377
                                            0.2
-0.028377
             0.2
                    0.065956
                                       0.2
0.065956
             0.2 0.035923
                                       0.2
0.035923
shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) petal length
```

(cm) petal length (cm) \

0	3.5	0.480027		1.4
-0.127706 1	3.0	-0.674134		1.4
-0.234609	3. 0	0.071131		± • 1
2	3.2	-0.341908		1.3
0.044201	3.1	-0.597395		1.5
0.091290	J • 1	0.337333		1.5
4	3.6	0.646835		1.4
0.015738				
petal widt:	h (cm) pe	tal width (cm)	sepal ler	ngth (cm)
sepal length	=		-	
0	0.2	-0.024168		5.1
-2.264703				
1	0.2	-0.103007		4.9
-2.080961 2	0.2	-0.028377		4.7
-2.364229	0.2	-0.026377		4./
3	0.2	0.065956		4.6
-2.299384				
4	0.2	0.035923		5.0
-2.389842				
shape (150, 8)			
*****	*****			
Accuracy= 0.	92			
Confusion Mat				
[[50 0 0]				
[0 48 2]				
[0 10 40]]				
Status: Improv				
		(cm) sepal ler	ngth (cm)	petal width
(cm) petal w				
0	5.1	-2.264703		0.2
-0.024168	4 0	2 000061		0 2
1 -0.103007	4.9	-2.080961		0.2
2	4.7	-2.364229		0.2
-0.028377				
3	4.6	-2.299384		0.2
0.065956				
4	5.0	-2.389842		0.2
0.035923				

```
petal length (cm) petal length (cm) petal width (cm)
petal width (cm)
            1.4 -0.127706
                                          0.2
-0.024168
            1.4 -0.234609
                                          0.2
-0.103007
            1.3
                         0.044201
                                          0.2
2
-0.028377
            1.5
                         0.091290
                                          0.2
0.065956
            1.4
                   0.015738
                                          0.2
0.035923
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
0
            1.4 -0.127706
                                          5.1
-2.264703
            1.4 -0.234609
                                          4.9
1
-2.080961
                                               4.7
            1.3
                         0.044201
    -2.364229
3
            1.5
                         0.091290
                                               4.6
    -2.299384
                                               5.0
4
            1.4
                         0.015738
    -2.389842
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
            0.2 -0.024168
                                          3.5
0.480027
            0.2 -0.103007
                                          3.0
-0.674134
            0.2 -0.028377
                                          3.2
-0.341908
```

3 -0.597395	0.2	0.065956	3.1
	0.2	0.035923	3.6
0.646835			
shape (150, 8)			
*****	****		
Accuracy= 0.9	2666666666	66666	
Confusion Matr	Cix		
[[50 0 0]			
[0 47 3]			
[0 8 42]]			
Status: Improve			
Features peta (cm) petal le		<pre>cm) petal length (c</pre>	m) petal length
0	1.4	-0.127706	1.4
-0.127706			
1	1.4	-0.234609	1.4
-0.234609			
2	1.3	0.044201	1.3
0.044201			
3	1.5	0.091290	1.5
0.091290			
4	1.4	0.015738	1.4
0.015738			
petal width width width (cm)	(cm) pet	al width (cm) petal	width (cm) petal
	0 2	-0.024168	0.2
-0.024168	0.2	0.021100	0.2
1	0.2	-0.103007	0.2
-0.103007	·-	0.100007	.
2	0.2	-0.028377	0.2
-0.028377			
3	0.2	0.065956	0.2
0.065956			
4	0.2	0.035923	0.2
0.035923			
shape (150, 8)			
******	*****		
Accuracy= 0.9		33333	
Confusion Matr	Cix		

[[50 0 0]

```
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
             3.5
                                             5.1
                     0.480027
-2.264703
             3.0
                    -0.674134
                                             4.9
-2.080961
             3.2
                    -0.341908
                                             4.7
-2.364229
             3.1 -0.597395
                                             4.6
3
-2.299384
             3.6 0.646835
                                             5.0
-2.389842
  petal length (cm) petal length (cm) sepal width (cm)
sepal width (cm) \
             1.4
                     -0.127706
                                             3.5
0.480027
             1.4 -0.234609
                                             3.0
-0.674134
             1.3
                           0.044201
                                             3.2
-0.341908
3
             1.5
                                             3.1
                           0.091290
-0.597395
             1.4
                           0.015738
                                             3.6
0.646835
  petal length (cm) petal length (cm)
             1.4
0
                    -0.127706
1
             1.4
                      -0.234609
2
             1.3
                           0.044201
3
             1.5
                           0.091290
             1.4
                           0.015738
shape (150, 10)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
```

Status: Improved

```
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
                -0.024168
            0.2
                                          3.5
0.480027
            0.2 -0.103007
                                          3.0
-0.674134
            0.2 -0.028377
                                          3.2
2
-0.341908
3
            0.2 0.065956
                                     3.1
-0.597395
            0.2 0.035923
                                     3.6
0.646835
  sepal width (cm) sepal width (cm) sepal length (cm)
sepal length (cm)
            3.5 0.480027
                                          5.1
-2.264703
            3.0 -0.674134
                                          4.9
1
-2.080961
            3.2 -0.341908
                                          4.7
-2.364229
            3.1 -0.597395
                                          4.6
3
-2.299384
            3.6 0.646835
                                          5.0
-2.389842
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal width
(cm) sepal width (cm) \
            5.1 -2.264703
                                          3.5
0.480027
            4.9
                   -2.080961
                                          3.0
-0.674134
            4.7
                  -2.364229
                                          3.2
2
-0.341908
            4.6 -2.299384
                                          3.1
-0.597395
```

```
3.6
            5.0 -2.389842
0.646835
  petal width (cm) petal width (cm) petal length (cm)
petal length (cm)
                    -0.024168
                                            1.4
             0.2
-0.127706
                   -0.103007
             0.2
                                            1.4
1
-0.234609
             0.2 -0.028377
                                            1.3
   0.044201
3
             0.2 0.065956
                                            1.5
   0.091290
            0.2 0.035923
4
                                            1.4
    0.015738
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 8 42]]
Status: Improved
Features petal width (cm) petal width (cm) petal length
(cm) petal length (cm) \
             0.2
                    -0.024168
                                            1.4
-0.127706
             0.2 -0.103007
                                            1.4
-0.234609
2
            0.2
                   -0.028377
                                            1.3
    0.044201
             0.2 0.065956
                                            1.5
3
    0.091290
4
             0.2 0.035923
                                            1.4
   0.015738
  sepal width (cm) sepal width (cm) petal length (cm)
petal length (cm)
             3.5 0.480027
                                            1.4
-0.127706
             3.0 -0.674134
                                            1.4
-0.234609
```

```
2
            3.2 -0.341908
                                         1.3
   0.044201
3
            3.1 -0.597395
                                         1.5
    0.091290
            3.6 0.646835
                                         1.4
4
    0.015738
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
0
            1.4 -0.127706
                                         1.4
-0.127706
            1.4 -0.234609
                                         1.4
-0.234609
            1.3
                                             1.3
2
                        0.044201
   0.044201
            1.5
                                             1.5
                        0.091290
   0.091290
4
            1.4
                       0.015738
                                             1.4
   0.015738
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
            5.1 -2.264703
                                         0.2
-0.024168
            4.9 -2.080961
                                         0.2
-0.103007
            4.7 -2.364229
                                         0.2
2
-0.028377
            4.6 -2.299384
                                         0.2
0.065956
            5.0 -2.389842
                                         0.2
0.035923
 petal width (cm) petal width (cm)
            0.2
0
                   -0.024168
```

1

0.2

```
3
            0.2
                    0.065956
             0.2
                    0.035923
shape (150, 10)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 9 41]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
            3.5
                                           5.1
0
                     0.480027
-2.264703
            3.0
                  -0.674134
                                           4.9
-2.080961
             3.2
                    -0.341908
                                           4.7
-2.364229
             3.1
                    -0.597395
                                           4.6
3
-2.299384
            3.6
                   0.646835
                                           5.0
-2.389842
  petal width (cm) petal width (cm) sepal length (cm)
sepal length (cm)
             0.2 -0.024168
                                           5.1
0
-2.264703
            0.2
                   -0.103007
                                           4.9
1
-2.080961
2
             0.2
                    -0.028377
                                           4.7
-2.364229
                                           4.6
             0.2
                    0.065956
-2.299384
            0.2 0.035923
                                           5.0
4
-2.389842
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
```

2

[0 47 3]

0.2

```
[ 0 8 42]]
Status: Improved
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
\Omega
             1.4 -0.127706
                                            3.5
0.480027
             1.4 -0.234609
                                            3.0
1
-0.674134
             1.3
                          0.044201
                                            3.2
-0.341908
             1.5
                          0.091290
                                            3.1
-0.597395
                                            3.6
             1.4
                         0.015738
0.646835
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm)
             5.1 -2.264703
0
                                            5.1
-2.264703
             4.9 -2.080961
                                            4.9
-2.080961
             4.7 -2.364229
                                            4.7
2
-2.364229
                                            4.6
             4.6 -2.299384
-2.299384
             5.0 -2.389842
                                            5.0
-2.389842
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
             1.4
                     -0.127706
                                            0.2
-0.024168
             1.4 -0.234609
                                            0.2
1
-0.103007
                          0.044201
             1.3
                                            0.2
```

```
1.5
                                         0.2
3
                        0.091290
0.065956
            1.4
                       0.015738
                                         0.2
0.035923
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm) \
                -2.264703
0
            5.1
                                         5.1
-2.264703
            4.9 -2.080961
                                         4.9
-2.080961
            4.7 -2.364229
                                         4.7
2
-2.364229
            4.6 -2.299384
                                         4.6
-2.299384
            5.0 -2.389842
                                         5.0
-2.389842
  petal length (cm) petal length (cm)
0
            1.4
                    -0.127706
1
            1.4
                   -0.234609
2
            1.3
                        0.044201
            1.5
                        0.091290
3
            1.4
                        0.015738
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
           3.5 0.480027
                                         5.1
0
-2.264703
            3.0 -0.674134
                                         4.9
-2.080961
            3.2 -0.341908
                                         4.7
-2.364229
                                         4.6
            3.1 -0.597395
-2.299384
```

```
5.0
           3.6 0.646835
-2.389842
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm) \
                    -0.127706
                                           5.1
             1.4
-2.264703
            1.4 -0.234609
                                           4.9
1
-2.080961
                         0.044201
             1.3
                                                4.7
    -2.364229
3
            1.5
                                                4.6
                         0.091290
    -2.299384
4
            1.4
                         0.015738
                                                5.0
   -2.389842
  sepal width (cm) sepal width (cm)
0
             3.5 0.480027
             3.0
                     -0.674134
1
2
             3.2
                     -0.341908
3
             3.1
                    -0.597395
             3.6
                    0.646835
shape (150, 10)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
             1.4 -0.127706
                                           0.2
-0.024168
             1.4 -0.234609
                                           0.2
1
-0.103007
2
             1.3
                                           0.2
                         0.044201
-0.028377
             1.5
                                           0.2
                         0.091290
0.065956
             1.4
                                           0.2
                         0.015738
0.035923
```

<pre>petal width width (cm)</pre>	(cm) pet	al width (c	m) sepal width (cm)	sepal
0	0.2	-0.024168	3.5	
0.480027	0.2	-0.103007	3.0	
-0.674134 2	0.2	-0.028377	3.2	
-0.341908 3	0.2	0.065956	3.1	
-0.597395 4 0.646835 shape (150, 8)	0.2	0.035923	3.6	
*****	****			
Accuracy= 0.92	2			
Confusion Matr				
[[50 0 0]				
[0 49 1]				
[0 11 39]]				
Status: Improve	d			
Features sepai	l length (cm) sepal	length (cm) sepal wid	th
(cm) sepal wid	dth (cm)	\		
0	5.1	-2.264703	3.5	
0.480027				
1	4.9	-2.080961	3.0	
-0.674134				
2	4.7	-2.364229	3.2	
-0.341908				
3	4.6	-2.299384	3.1	
-0.597395				
4	5.0	-2.389842	3.6	
0.646835				
sepal lengtl	h (cm) se	pal length	(cm) petal length (cm)
petal length (cm) \			
0	5.1	-2.264703	1.4	
-0.127706				
1	4.9	-2.080961	1.4	
-0.234609				
2	4.7	-2.364229	1.3	
0.044201				
3	4.6	-2.299384	1.5	
0.091290				

```
5.0 -2.389842
                                             1.4
4
    0.015738
  petal length (cm) petal length (cm)
0
             1.4
                      -0.127706
             1.4
                      -0.234609
1
2
             1.3
                          0.044201
3
             1.5
                          0.091290
             1.4
                          0.015738
shape (150, 10)
*****
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.9621949409856263
Status: Accepted
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
                    -0.127706
                                             0.2
0
             1.4
-0.024168
1
             1.4 -0.234609
                                             0.2
-0.103007
             1.3
                          0.044201
                                             0.2
-0.028377
             1.5
                          0.091290
                                             0.2
0.065956
             1.4
                          0.015738
                                             0.2
0.035923
  sepal width (cm) sepal width (cm) sepal width (cm) sepal
width (cm) \
             3.5 0.480027
                                        3.5
0.480027
             3.0 -0.674134
                                             3.0
-0.674134
                                             3.2
             3.2 -0.341908
-0.341908
             3.1 -0.597395
                                             3.1
```

```
3.6 0.646835
                                       3.6
4
0.646835
  petal length (cm) petal length (cm)
0
             1.4
                     -0.127706
             1.4
                     -0.234609
1
2
             1.3
                          0.044201
3
             1.5
                          0.091290
             1.4
                          0.015738
final shape (150, 10)
****
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 9 41]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
             3.5
                    0.480027
                                            5.1
-2.264703
             3.0 -0.674134
                                            4.9
-2.080961
2
             3.2 -0.341908
                                            4.7
-2.364229
             3.1
                   -0.597395
                                            4.6
3
-2.299384
                                            5.0
             3.6 0.646835
-2.389842
  petal length (cm) petal length (cm) petal length (cm)
petal length (cm)
             1.4
                    -0.127706
                                            1.4
-0.127706
             1.4 -0.234609
                                            1.4
1
-0.234609
2
             1.3
                          0.044201
                                                1.3
    0.044201
3
             1.5
                          0.091290
                                                1.5
    0.091290
             1.4
                         0.015738
                                                1.4
    0.015738
shape (150, 8)
```

```
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 9 41]]
Status: Improved
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
0
             1.4 -0.127706
                                            3.5
0.480027
1
             1.4 -0.234609
                                            3.0
-0.674134
             1.3
                                            3.2
                          0.044201
-0.341908
             1.5
                          0.091290
                                            3.1
-0.597395
             1.4
                         0.015738
                                            3.6
0.646835
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
             5.1 -2.264703
                                             0.2
-0.024168
             4.9 -2.080961
                                             0.2
-0.103007
             4.7 -2.364229
                                            0.2
2
-0.028377
             4.6 -2.299384
                                            0.2
0.065956
             5.0 -2.389842
                                            0.2
0.035923
  sepal width (cm) sepal width (cm)
             3.5
                  0.480027
0
1
             3.0
                      -0.674134
2
             3.2
                      -0.341908
3
             3.1
                      -0.597395
             3.6 0.646835
shape (150, 10)
```

Accuracy= 0.9

```
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.48306553509788397
Status: Accepted
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
                                            3.5
             0.2
                -0.024168
0.480027
             0.2 -0.103007
                                            3.0
-0.674134
             0.2 -0.028377
                                            3.2
-0.341908
             0.2
                    0.065956
                                       3.1
-0.597395
4
             0.2 0.035923
                                       3.6
0.646835
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm)
             1.4 -0.127706
                                            5.1
-2.264703
1
             1.4 -0.234609
                                            4.9
-2.080961
                                                4.7
             1.3
                         0.044201
2
    -2.364229
                                                4.6
             1.5
3
                         0.091290
    -2.299384
4
            1.4
                    0.015738
                                                5.0
    -2.389842
final shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
```

0	1.4	-0.127706	5.1
-2.264703 1	1.4	-0.234609	4.9
-2.080961			
2 -2.36422	1.3	0.044201	4.7
-2.36422 3	1.5	0.091290	4.6
-2.29938 4	1.4	0.015738	5.0
-2.38984		0.013738	5.0
2	1 /)		
sepal widt sepal length		epal width (cm) se	pal length (cm)
0	3.5	0.480027	5.1
-2.264703			
1	3.0	-0.674134	4.9
-2.080961			
2	3.2	-0.341908	4.7
-2.364229 3	3.1	-0.597395	4.6
-2.299384	3.1	-0.397393	4.0
4	3.6	0.646835	5.0
-2.389842			
shape (150, 8)		
	als also also also also also also also		
*****		000000	
Accuracy= 0. Confusion Mat		000000	
[[50 0 0]			
[0 48 2]			
[0 11 39]]			
Status: Improv	ed		
Features sep	al width ((cm) sepal width (cm) sepal length
(cm) sepal l			
0	3.5	0.480027	5.1
-2.264703	2 0	0 674104	4 0
1 -2.080961	3.0	-0.674134	4.9
-2.080961 2	3.2	-0.341908	4.7
-2.364229	~ · ·	0.01100	- · ·
3	3.1	-0.597395	4.6
-2.299384			
4	3.6	0.646835	5.0
-2.389842			

petal width sepal length (=	al width (cm) sepal leng	gth (cm)
0 -2.264703	0.2	-0.024168	5.1
1 -2.080961	0.2	-0.103007	4.9
2 -2.364229	0.2	-0.028377	4.7
3 -2.299384	0.2	0.065956	4.6
4 -2.389842 shape (150, 8)	0.2	0.035923	5.0
********** Accuracy= 0.9 Confusion Matr [[50 0 0] [0 47 3] [0 11 39]] Status:Improve	0666666666 ix	66666	
Features peta (cm) petal le		m) petal width (cm) pet	tal length
0 -0.127706	_	-0.024168	1.4
1 -0.234609	0.2	-0.103007	1.4
2 0.044201	0.2	-0.028377	1.3
3 0.091290	0.2	0.065956	1.5
0.015738	0.2	0.035923	1.4
sepal lengt		pal length (cm) petal wi	ldth (cm)
0 -0.024168	5.1	-2.264703	0.2
1	4 0	-2.080961	0 2
-0.103007	4.9	-2.000901	0.2

3	4.6	-2.299384	0.2
0.065956			
4	5.0	-2.389842	0.2
0.035923			
shape (150, 8)			
******	*****		
Accuracy= 0.9	2666666666	66666	
Confusion Matr	ix		
[[50 0 0]			
[0 47 3]			
[0 8 42]]			
Status: Improve	d		
=		cm) petal length (cm) s	epal length
(cm) sepal le	_		cpar rengen
(cm) separ re	-	-0.127706	5.1
-2.264703	T • 4	0.127700	J•1
1	1 /	-0.234609	4.9
-2.080961	1.1	0.234003	1.9
2.000301	1.3	0.044201	4.7
	1.5	0.044201	4./
-2.364229	1 -	0.001200	4 6
3	1.5	0.091290	4.6
-2.299384		0.01500	- 0
4	1.4	0.015738	5.0
-2.389842			
gonal long+	h (am) ao:	pal length (cm) sepal wi	d+b (cm)
		par rength (cm) separ wr	ath (cm)
sepal width (c		2 264702) F
0	5.1	-2.264/03	3.5
0.480027	4 0	2 000061	2 0
1	4.9	-2.080961	3.0
-0.674134	4 👨	0.064000	2 2
2	4.7	-2.364229	3.2
-0.341908			
3	4.6	-2.299384	3.1
-0.597395			
4	5.0	-2.389842	3.6
0.646835			
shape (150, 8)			
******	*****		
Accuracy= 0.9			

Accuracy= 0.9 Confusion Matrix [[50 0 0]

```
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.15028471557145595
Status: Accepted
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
0
             1.4
                     -0.127706
                                              0.2
-0.024168
             1.4 -0.234609
                                              0.2
-0.103007
             1.3
2
                           0.044201
                                              0.2
-0.028377
             1.5
                           0.091290
                                              0.2
0.065956
             1.4
                           0.015738
                                              0.2
0.035923
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm)
             5.1
                  -2.264703
                                              0.2
-0.024168
             4.9 -2.080961
                                              0.2
-0.103007
2
             4.7 -2.364229
                                              0.2
-0.028377
             4.6 -2.299384
                                              0.2
3
0.065956
             5.0
                     -2.389842
                                              0.2
0.035923
final shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 8 42]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
                     -2.264703
                                              0.2
             5.1
```

1	4.9	-2.080961	0.2
-0.103007 2 -0.028377	4.7	-2.364229	0.2
3 0.065956	4.6	-2.299384	0.2
4 0.035923	5.0	-2.389842	0.2
0.033923			
sepal widtl petal length	_	pal width (cm) petal len	gth (cm)
0 -0.127706	3.5	0.480027	1.4
1 -0.234609	3.0	-0.674134	1.4
2	3.2	-0.341908	1.3
0.044201	3.1	-0.597395	1.5
0.091290	3.6	0.646835	1.4
0.015738 shape (150, 8))		
********** Accuracy= 0.9 Confusion Mat: [[50 0 0] [0 47 3] [0 10 40]] Status:Improve	91333333333 rix	333333	
-		(cm) sepal length (cm)	senal width
(cm) sepal w	=		sopar wracii
0 0.480027		-2.264703	3.5
1 -0.674134	4.9	-2.080961	3.0
2 -0.341908	4.7	-2.364229	3.2
3	4.6	-2.299384	3.1
-0.597395 4 0.646835	5.0	-2.389842	3.6

sepal width		epal width (cm)	sepal length (cm)
0		0.480027	5.1
-2.264703			
1	3.0	-0.674134	4.9
-2.080961 2	3.2	-0.341908	4.7
-2.364229	J•2	0.341300	4. /
3	3.1	-0.597395	4.6
-2.299384			
4	3.6	0.646835	5.0
-2.389842 shape (150, 8)	1		
511apc (130, 0)	'		
*****	*****		
Accuracy= 0.9			
Confusion Mat	rix		
[[50 0 0] [0 46 4]			
[0 8 42]]			
Status: Improve	ed		
=		(cm) petal widt	h (cm) sepal width (cm)
sepal width (d	cm) \		
0	0.2	-0.024168	3.5
0.480027			
1	0.2	-0.103007	3.0
-0.674134 2	0.2	-0.028377	3.2
-0.341908	0.2	-0.020377	3.2
3	0.2	0.065956	3.1
-0.597395			
4	0.2	0.035923	3.6
0.646835			
gonal longt	- h (am)	gonal longth (gm	aonal longth (gm)
sepai rengt sepal length		separ rength (Chi	n) sepal length (cm)
0		-2.264703	5.1
-2.264703			
1	4.9	-2.080961	4.9
-2.080961			
2	4.7	-2.364229	4.7
-2.364229	4 6	0.000004	4.6
3 -2.299384	4.6	-2.299384	4.6
-4.499304			

```
5.0 -2.389842
                                         5.0
-2.389842
  petal length (cm) petal length (cm)
0
            1.4
                   -0.127706
            1.4
                   -0.234609
1
2
            1.3
                        0.044201
3
            1.5
                        0.091290
            1.4
                        0.015738
shape (150, 10)
****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
\cap
            1.4 -0.127706
                                         5.1
-2.264703
            1.4 -0.234609
                                         4.9
-2.080961
2
            1.3
                                             4.7
                        0.044201
    -2.364229
3
            1.5
                       0.091290
                                             4.6
    -2.299384
                                             5.0
            1.4
                       0.015738
4
    -2.389842
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
            0.2 -0.024168
                                         3.5
0.480027
            0.2 -0.103007
1
                                         3.0
-0.674134
2
            0.2 -0.028377
                                         3.2
-0.341908
            0.2 0.065956 3.1
3
-0.597395
            0.2 0.035923
                                     3.6
0.646835
```

shape (150, 8)

```
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 9 41]]
Status: Improved
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
0
            1.4 -0.127706
                                         3.5
0.480027
1
            1.4 -0.234609
                                         3.0
-0.674134
            1.3
                                         3.2
                       0.044201
-0.341908
            1.5
                       0.091290
                                        3.1
-0.597395
            1.4
                       0.015738
                                         3.6
0.646835
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
                                    0.2
            3.5 0.480027
-0.024168
            3.0 -0.674134
                                         0.2
-0.103007
            3.2 -0.341908
                                         0.2
2
-0.028377
            3.1 -0.597395
                                         0.2
0.065956
            3.6 0.646835
                                    0.2
0.035923
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 8 42]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal width
```

(cm) sepal width (cm) \

```
5.1 -2.264703
                                          3.5
0
0.480027
            4.9 -2.080961
                                          3.0
-0.674134
            4.7 -2.364229
                                          3.2
2
-0.341908
            4.6 -2.299384
                                          3.1
3
-0.597395
            5.0 -2.389842
                                          3.6
0.646835
  petal length (cm) petal length (cm) petal length (cm)
petal length (cm) \
            1.4 -0.127706
                                          1.4
-0.127706
            1.4 -0.234609
                                          1.4
1
-0.234609
2
            1.3
                        0.044201
                                               1.3
    0.044201
3
            1.5
                  0.091290
                                               1.5
   0.091290
            1.4
                   0.015738
                                               1.4
4
   0.015738
  sepal width (cm) sepal width (cm)
0
            3.5 0.480027
            3.0
1
                     -0.674134
2
            3.2
                     -0.341908
3
            3.1
                     -0.597395
            3.6 0.646835
shape (150, 10)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
                  -0.127706
            1.4
                                          3.5
0.480027
```

1	1.4	-0.234609	3.0	
-0.674134 2	1.3	0.044201	3.2	
-0.341908 3	1.5	0.091290	3.1	
-0.597395 4 0.646835	1.4	0.015738	3.6	
petal width	n (cm) pe	tal width (cm) s	epal width (cm) sepal	
0 0.480027	0.2	-0.024168	3.5	
1 -0.674134	0.2	-0.103007	3.0	
2 -0.341908	0.2	-0.028377	3.2	
3	0.2	0.065956	3.1	
-0.597395 4 0.646835 shape (150, 8)		0.035923	3.6	
************ Accuracy= 0.9 Confusion Matr	92			
[[50 0 0] [0 47 3] [0 9 41]]	LIX			
Status: Improve	ed			
Features peta (cm) sepal le			h (cm) sepal length	
0 -2.264703		-0.127706	5.1	
1 -2.080961	1.4	-0.234609	4.9	
2.000901	1.3	0.044201	4.7	
-2.364229		0.044201	4./	
3	1.5	0.091290	4.6	
-2.299384				
4 -2.389842	1.4	0.015738	5.0	
2.000012	=			

petal width width (cm)	(cm) pet	al width (cm)	sepal width (cm) sepal
0 0.480027	0.2	-0.024168	3.5
1 -0.674134	0.2	-0.103007	3.0
2 -0.341908	0.2	-0.028377	3.2
3 -0.597395	0.2	0.065956	3.1
4 0.646835 shape (150, 8)	0.2	0.035923	3.6

Accuracy= 0.9 Confusion Matr		33333	
[[50 0 0] [0 46 4] [0 9 41]]			
Status: Improve			
Features sepa (cm) petal wi	-	=	ngth (cm) petal width
0 -0.024168		-2.264703	0.2
1 -0.103007	4.9	-2.080961	0.2
2 -0.028377	4.7	-2.364229	0.2
3	4.6	-2.299384	0.2
4 0.035923	5.0	-2.389842	0.2
petal lengt	-	etal length (cm	n) petal width (cm)
0	1.4	-0.127706	0.2
-0.024168 1	1.4	-0.234609	0.2
-0.103007 2 -0.028377	1.3	0.044201	0.2
3 0.065956	1.5	0.091290	0.2

```
1.4
                                        0.2
                       0.015738
0.035923
shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2
                 -0.024168
                                         3.5
0.480027
            0.2
                   -0.103007
                                         3.0
-0.674134
2
            0.2
                  -0.028377
                                         3.2
-0.341908
3
            0.2 0.065956 3.1
-0.597395
            0.2 0.035923
                                     3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
                 -2.264703
                                         1.4
            5.1
-0.127706
            4.9
                   -2.080961
                                         1.4
-0.234609
2
            4.7
                  -2.364229
                                         1.3
    0.044201
                                         1.5
3
            4.6
                  -2.299384
    0.091290
            5.0 -2.389842
                                         1.4
4
    0.015738
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
```

```
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
             5.1 -2.264703
                                           0.2
-0.024168
             4.9
                                           0.2
                   -2.080961
-0.103007
            4.7
                   -2.364229
                                           0.2
2
-0.028377
            4.6 -2.299384
                                           0.2
0.065956
            5.0 -2.389842
                                           0.2
0.035923
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm) \
            1.4 -0.127706
                                           5.1
-2.264703
                                           4.9
            1.4 -0.234609
-2.080961
            1.3
                         0.044201
                                               4.7
2
    -2.364229
                        0.091290
                                               4.6
3
            1.5
    -2.299384
            1.4
                   0.015738
                                               5.0
4
    -2.389842
  petal length (cm) petal length (cm)
0
            1.4
                     -0.127706
1
            1.4 -0.234609
2
            1.3
                         0.044201
3
            1.5
                         0.091290
             1.4
                         0.015738
shape (150, 10)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
```

0	0.000	0.2	-0.024168	3.5
0.48	0027	0.2	-0.103007	3.0
-0.6°	74134	0.2	-0.028377	3.2
-0.3	41908	0.2	0.065956	3.1
	97395	0.2	0.000000	J.1
4	6025	0.2	0.035923	3.6
0.64	6833			
=		-	al width (cm) sepal	length (cm)
sepa 0	l length (o.2	-0.024168	5.1
-	64703	0.2	-0.024100	J • 1
1		0.2	-0.103007	4.9
	80961			
2	C 4 2 2 0	0.2	-0.028377	4.7
-2.3 3	64229	0.2	0.065956	4.6
_	99384	· · ·		
4		0.2	0.035923	5.0
	89842			
snap	e (150, 8)			
***	*****	*****		
Accu	racy= 0.9	2		
	usion Matr	ix		
[[50				
=	46 4] 8 42]]			
=	us:Improve	d		
	_		m) petal width (cm)	petal length
(cm)	petal le	ngth (cm)	\	
0		0.2	-0.024168	1.4
	27706	0 0	0 102007	1 4
1 -0 2	34609	0.2	-0.103007	1.4
2	J 7 0 0 <i>3</i>	0.2	-0.028377	1.3
	0.044201			
3		0.2	0.065956	1.5
	0.091290			
4	0 015720	0.2	0.035923	1.4
	0.015738			

sepal width	(cm) sep	al width (cm) sepal	width (cm) sepal
width (cm)			
0	3.5	0.480027	3.5
0.480027			
1	3.0	-0.674134	3.0
-0.674134			
2	3.2	-0.341908	3.2
-0.341908			
3	3.1	-0.597395	3.1
-0.597395	2 6	0 646005	2 6
4	3.6	0.646835	3.6
0.646835			
shape (150, 8)			
*****	*****		
Accuracy= 0.9	0666666666	66666	
Confusion Matr			
[[50 0 0]			
[0 47 3]			
[0 11 39]]			
~ –			
Status: Improve	d		
-		m) petal width (cm)	sepal width (cm)
-	l width (c	m) petal width (cm)	sepal width (cm)
Features peta	l width (c m) \	m) petal width (cm) -0.024168	sepal width (cm)
Features peta sepal width (c	l width (c m) \	-	_
Features peta sepal width (contract)	l width (cm) \	-	_
Features peta sepal width (control of the control o	l width (cm) \	-0.024168	3.5
Features peta sepal width (c: 0 0.480027 1 -0.674134	l width (cm) \ 0.2 0.2	-0.024168	3.5
Features peta sepal width (c. 0 0.480027 1 -0.674134 2 -0.341908	l width (cm) \ 0.2 0.2 0.2	-0.024168 -0.103007 -0.028377	3.5 3.0 3.2
Features peta sepal width (c: 0 0.480027 1 -0.674134 2 -0.341908 3	l width (cm) \ 0.2 0.2 0.2	-0.024168 -0.103007	3.5
Features peta sepal width (c. 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395	l width (cm) \ 0.2 0.2 0.2 0.2	-0.024168 -0.103007 -0.028377 0.065956	3.5 3.0 3.2 3.1
Features peta sepal width (c: 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4	l width (cm) \ 0.2 0.2 0.2 0.2	-0.024168 -0.103007 -0.028377	3.5 3.0 3.2
Features peta sepal width (c. 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395	l width (cm) \ 0.2 0.2 0.2 0.2	-0.024168 -0.103007 -0.028377 0.065956	3.5 3.0 3.2 3.1
Features peta sepal width (c: 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923	3.5 3.0 3.2 3.1 3.6
Features peta sepal width (c: 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2 h (cm) se</pre>	-0.024168 -0.103007 -0.028377 0.065956	3.5 3.0 3.2 3.1 3.6
Features peta sepal width (con 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal lengt petal width (con	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 h (cm) se m)</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923 pal length (cm) pet	3.5 3.0 3.2 3.1 3.6
Features peta sepal width (c: 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal lengt petal width (c: 0	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2 h (cm) se</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923	3.5 3.0 3.2 3.1 3.6
Features peta sepal width (control 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal lengt petal width (control 0 -0.024168	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2 h (cm) se m) 5.1</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923 pal length (cm) pet	3.5 3.0 3.2 3.1 3.6 tal width (cm) 0.2
Features peta sepal width (contribute) 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal lengt petal width (contribute) 0 -0.024168 1	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2 h (cm) se m) 5.1</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923 pal length (cm) pet	3.5 3.0 3.2 3.1 3.6
Features peta sepal width (control 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal lengt petal width (control 0 -0.024168 1 -0.103007	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2 h (cm) se m) 5.1 4.9</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923 pal length (cm) pet -2.264703 -2.080961	3.5 3.0 3.2 3.1 3.6 2al width (cm) 0.2 0.2
Features peta sepal width (contribute) 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal lengt petal width (contribute) 0 -0.024168 1	<pre>l width (c m) \ 0.2 0.2 0.2 0.2 0.2 0.2 h (cm) se m) 5.1 4.9</pre>	-0.024168 -0.103007 -0.028377 0.065956 0.035923 pal length (cm) pet	3.5 3.0 3.2 3.1 3.6 tal width (cm) 0.2

3	4.6	-2.299384	0.2	
0.065956 4 0.035923 shape (150, 8)		-2.389842	0.2	
*****	****			
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 48 2] [0 10 40]] Status:Improve	rix			
-		(cm) sepal	length (cm) sepal width	
(cm) sepal wi				
0	5.1	-2.264703	3.5	
0.480027	4 9	-2.080961	3.0	
-0.674134	1.5	2.000901	3.3	
2	4.7	-2.364229	3.2	
-0.341908				
3	4.6	-2.299384	3.1	
-0.597395	E 0	2 200042	3.6	
4 0.646835	5.0	-2.389842	3.6	
senal lengt	h (cm)	senal length	(cm) sepal width (cm)	
sepal width (c			(om) Sopar Wideli (om)	
0		-2.264703	3.5	
0.480027				
1	4.9	-2.080961	3.0	
-0.674134	4 7	2 264220	2 2	
2 -0.341908	4.7	-2.364229	3.2	
3	4.6	-2.299384	3.1	
-0.597395				
4	5.0	-2.389842	3.6	
0.646835 shape (150, 8)				
******	*****			
Accuracy= 0.9	2			

Accuracy= 0.92
Confusion Matrix
[[50 0 0]

```
[ 0 47 3]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
             0.2
                    -0.024168
                                            3.5
0.480027
                    -0.103007
             0.2
                                            3.0
-0.674134
                                            3.2
             0.2
                   -0.028377
-0.341908
             0.2 0.065956
3
                                        3.1
-0.597395
             0.2 0.035923
                                        3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
                     -2.264703
                                             1.4
             5.1
-0.127706
             4.9
                    -2.080961
                                            1.4
-0.234609
             4.7
                   -2.364229
                                            1.3
2
    0.044201
             4.6 -2.299384
                                            1.5
3
    0.091290
             5.0 -2.389842
                                            1.4
4
    0.015738
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 8 42]]
Status: Improved
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
             1.4 -0.127706
                                             0.2
-0.024168
             1.4 -0.234609
                                            0.2
```

2	1.3	0.044201	0.2
-0.028377 3	1.5	0.091290	0.2
0.065956 4 0.035923	1.4	0.015738	0.2
=	(cm) sep	al width (cm) sepal	width (cm) sepal
width (cm) 0	3.5	0.480027	3.5
0.480027	3.0	-0.674134	3.0
-0.674134 2	3.2	-0.341908	3.2
-0.341908 3 -0.597395	3.1	-0.597395	3.1
4 0.646835 shape (150, 8)	3.6	0.646835	3.6
********** Accuracy= 0.9 Confusion Matr [[50 0 0] [0 48 2] [0 9 41]] Status:Improve	2666666666 ix	66666	
=	l width (c	m) petal width (cm)	sepal width (cm)
0 0.480027	0.2	-0.024168	3.5
1 -0.674134	0.2	-0.103007	3.0
2 -0.341908	0.2	-0.028377	3.2
3 -0.597395	0.2	0.065956	3.1
4 0.646835	0.2	0.035923	3.6
sepal lengt	h (cm) se	pal length (cm) sep	al length (cm)

sepal length (cm)

0	5.1	-2.264703		5.1			
-2.264703							
1	4.9	-2.080961		4.9			
-2.080961							
2	4.7	-2.364229		4.7			
-2.364229							
3	4.6	-2.299384		4.6			
-2.299384							
4	5.0	-2.389842		5.0			
-2.389842							
shape (150, 8)							
******	*****						
Accuracy= 0.9	2						
Confusion Matr							
[[50 0 0]							
[0 48 2]							
[0 10 40]]							
Status: Improve	d						
-		cm) petal le	ength (cm)	petal	width		
Features petal length (cm) petal length (cm) petal width (cm) petal width (cm) \							
0		-0.127706		0.2			
-0.024168							
1	1.4	-0.234609		0.2			
-0.103007							
2	1.3	0.04420)1	0.2			
-0.028377							
3	1.5	0.09129	90	0.2			
0.065956							
4	1.4	0.01573	38	0.2			
0.035923							
petal lengt	h (cm) pe	tal length (c	cm) sepal	length	(cm)		
sepal length (cm)						
0	1.4	-0.127706		5.1			
-2.264703							
1	1.4	-0.234609		4.9			
-2.080961							
2	1.3	0.04420)1		4.7		
-2.364229							
3	1.5	0.09129	90		4.6		
-2.299384							
4	1.4	0.01573	38		5.0		
-2.389842							

shape (150, 8)

```
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
                    -0.127706
             1.4
                                            1.4
-0.127706
             1.4 -0.234609
                                            1.4
-0.234609
             1.3
                          0.044201
                                                1.3
2
    0.044201
             1.5
                          0.091290
                                                1.5
3
    0.091290
4
             1.4
                          0.015738
                                                1.4
    0.015738
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm) \
             0.2 -0.024168
                                            3.5
0
0.480027
             0.2
                    -0.103007
                                            3.0
-0.674134
             0.2
                     -0.028377
                                            3.2
-0.341908
3
             0.2
                    0.065956
                                       3.1
-0.597395
             0.2 0.035923
                                       3.6
0.646835
  sepal length (cm) sepal length (cm)
             5.1
0
                     -2.264703
1
             4.9
                     -2.080961
2
             4.7
                     -2.364229
3
             4.6
                     -2.299384
             5.0
                     -2.389842
shape (150, 10)
```

```
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
             1.4
                    -0.127706
                                           5.1
-2.264703
             1.4 -0.234609
                                           4.9
-2.080961
                                                4.7
2
             1.3
                         0.044201
    -2.364229
             1.5
3
                          0.091290
                                                4.6
    -2.299384
             1.4
                     0.015738
                                                5.0
    -2.389842
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm)
             0.2 -0.024168
                                           0.2
-0.024168
             0.2
                    -0.103007
                                           0.2
-0.103007
2
             0.2
                    -0.028377
                                           0.2
-0.028377
             0.2 0.065956
                                       0.2
3
0.065956
             0.2 0.035923
                                       0.2
0.035923
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
             0.2
                -0.024168
                                           5.1
-2.264703
```

1	0.2	-0.103007	4.9					
-2.080961 2	0.2	-0.028377	4.7					
-2.364229								
3	0.2	0.065956	4.6					
-2.299384 4	0.2	0.035923	5.0					
-2.389842	0.2	0.033323	J.0					
	petal length (cm) petal length (cm) sepal width (cm)							
sepal width 0		-0.127706	3.5					
0.480027	1.4	-0.127700	3.3					
1	1.4	-0.234609	3.0					
-0.674134								
2	1.3	0.044201	3.2					
-0.341908								
3	1.5	0.091290	3.1					
-0.597395								
4	1.4	0.015738	3.6					
0.646835	o v							
shape (150, 8	o)							
******	******	•						
Accuracy= 0.	. 92							
Confusion Mat								
[[50 0 0]								
[0 48 2]								
[0 10 40]]								
Status: Improv	ved							
Features sep	pal width	(cm) sepal width (c	cm) sepal length					
(cm) sepal 1								
0	3.5	0.480027	5.1					
-2.264703	2 0	0 684104	4 0					
1	3.0	-0.674134	4.9					
-2.080961 2	3.2	-0.341908	4.7					
-2.364229	J • Z	0.541500	1. /					
3	3.1	-0.597395	4.6					
-2.299384								
4	3.6	0.646835	5.0					
-2.389842								

```
petal width (cm) petal width (cm) petal width (cm) petal
width (cm) \
             0.2 -0.024168
                                             0.2
-0.024168
             0.2 -0.103007
                                             0.2
-0.103007
             0.2
                   -0.028377
                                            0.2
2
-0.028377
3
             0.2
                     0.065956
                                       0.2
0.065956
             0.2 0.035923
                                        0.2
0.035923
  sepal width (cm) sepal width (cm)
             3.5
0
                    0.480027
             3.0
                      -0.674134
1
2
             3.2
                      -0.341908
3
             3.1
                      -0.597395
             3.6
                     0.646835
shape (150, 10)
******
Accuracy= 0.91333333333333333
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
0
             0.2
                    -0.024168
                                            3.5
0.480027
             0.2
                   -0.103007
                                             3.0
-0.674134
             0.2
                   -0.028377
                                            3.2
2
-0.341908
                     0.065956
                                       3.1
3
             0.2
-0.597395
             0.2 0.035923
                                        3.6
0.646835
```

sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)

0 -0 12	27706	5.1	-2.264703	1.4
1		4.9	-2.080961	1.4
2	0.044201	4.7	-2.364229	1.3
3	0.044201	4.6	-2.299384	1.5
4	0.015738	5.0	-2.389842	1.4
shape	e (150, 8)			

Confu [[50 [0 [0 Statu	<pre>racy= 0.9 usion Matr 0 0] 47 3] 9 41]] us:Improve</pre>	ix d		
		l width (c ngth (cm)	m) sepal width (cm) pet \	al length
0	_	3.5		1.4
-0.12	27706	3.0	-0.674134	1.4
-0.23 2	34609	3.2	-0.341908	1.3
3	0.044201	3.1	-0.597395	1.5
4	0.091290	2 6	0.646005	1 4
4	0.015738	3.6	0.646835	1.4
	epal lengt L length (pal length (cm) petal le	ngth (cm)
0	27706		-2.264703	1.4
1		4.9	-2.080961	1.4
-0.23 2		4.7	-2.364229	1.3
3	0.044201	4.6	-2.299384	1.5
4	0.091290	5.0	-2.389842	1.4
	0.015738			

```
sepal width (cm) sepal width (cm)
0
            3.5
                  0.480027
1
            3.0
                     -0.674134
2.
            3.2
                     -0.341908
3
            3.1
                     -0.597395
            3.6
                    0.646835
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
            3.5
                 0.480027
                                           5.1
-2.264703
            3.0 -0.674134
                                           4.9
-2.080961
            3.2 -0.341908
                                           4.7
-2.364229
3
            3.1 -0.597395
                                           4.6
-2.299384
            3.6 0.646835
                                           5.0
-2.389842
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm) \
             0.2 -0.024168
                                           0.2
-0.024168
            0.2
                    -0.103007
                                           0.2
-0.103007
                   -0.028377
                                           0.2
2
            0.2
-0.028377
            0.2 0.065956
                                      0.2
0.065956
             0.2 0.035923
                                      0.2
0.035923
  sepal width (cm) sepal width (cm)
```

0

3.5

0.480027

```
3.0
1
                   -0.674134
2
            3.2
                    -0.341908
3
            3.1
                    -0.597395
            3.6
                   0.646835
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
            0.2
                   -0.024168
                                         5.1
-2.264703
1
            0.2 -0.103007
                                         4.9
-2.080961
            0.2 -0.028377
                                        4.7
-2.364229
            0.2 0.065956
                                         4.6
3
-2.299384
            0.2 0.035923
                                         5.0
-2.389842
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
            5.1
                   -2.264703
                                         1.4
-0.127706
1
            4.9
                  -2.080961
                                         1.4
-0.234609
                                         1.3
            4.7
                 -2.364229
    0.044201
            4.6 -2.299384
                                        1.5
3
    0.091290
            5.0 -2.389842
4
                                         1.4
    0.015738
shape (150, 8)
******
Confusion Matrix
```

[[50 0 0]

```
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
                    -2.264703
                                           0.2
             5.1
-0.024168
             4.9
                   -2.080961
                                           0.2
1
-0.103007
             4.7 -2.364229
                                           0.2
-0.028377
             4.6 -2.299384
                                           0.2
3
0.065956
             5.0 -2.389842
                                           0.2
0.035923
  petal length (cm) petal length (cm) petal width (cm)
petal width (cm) \
             1.4
                                           0.2
                    -0.127706
-0.024168
             1.4 -0.234609
                                           0.2
-0.103007
             1.3
                         0.044201
                                           0.2
-0.028377
3
             1.5
                                           0.2
                         0.091290
0.065956
             1.4
                         0.015738
                                           0.2
0.035923
  petal length (cm) petal length (cm)
0
             1.4
                   -0.127706
1
             1.4
                     -0.234609
2
             1.3
                          0.044201
3
             1.5
                         0.091290
             1.4
                         0.015738
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
```

Status: Improved

```
Features sepal width (cm) sepal width (cm) petal width (cm)
petal width (cm) \
             3.5
                0.480027
                                     0.2
-0.024168
                                           0.2
             3.0 -0.674134
-0.103007
             3.2 -0.341908
                                           0.2
2
-0.028377
             3.1
                    -0.597395
                                           0.2
0.065956
             3.6 0.646835
                                      0.2
0.035923
  petal width (cm) petal width (cm) petal length (cm)
petal length (cm) \
                    -0.024168
                                           1.4
             0.2
-0.127706
1
             0.2
                   -0.103007
                                           1.4
-0.234609
2
             0.2 -0.028377
                                           1.3
    0.044201
             0.2 0.065956
3
                                           1.5
    0.091290
            0.2 0.035923
                                           1.4
4
   0.015738
  sepal length (cm) sepal length (cm)
0
             5.1
                    -2.264703
1
             4.9
                     -2.080961
             4.7
2
                     -2.364229
3
             4.6
                     -2.299384
             5.0
                     -2.389842
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal length
(cm) sepal length (cm) \
```

0	6.4500	5.1	-2.264703	5.1
-2.2 1	64703	4.9	-2.080961	4.9
-2.0 2	80961	4.7	-2.364229	4.7
	64229	-		·
3 -2 2	99384	4.6	-2.299384	4.6
4	33301	5.0	-2.389842	5.0
-2.3	89842			
	epal width	(cm) sepa	al width (cm) petal	width (cm) petal
0	II (CIII)	3.5	0.480027	0.2
	24168	2 0	0 (74124	0.2
1 -0.1	03007	3.0	-0.674134	0.2
2	00000	3.2	-0.341908	0.2
-0.0 3	28377	3.1	-0.597395	0.2
0.06	5956			
4 0.03	5923	3.6	0.646835	0.2
	e (150, 8)			
***	*****	****		
Accu	racy= 0.90	0666666666	56666	
	usion Matri	ix		
[50]	0 0] 47 3]			
	11 39]]			
	us:Improved			
	ures sepa. petal ler		m) sepal width (cm)	petal length
0	pecar rei	3.5		1.4
-0.1	27706			
1		3.0	-0.674134	1.4
	34609		0.044.000	4.0
2	0.044201	3.2	-0.341908	1.3
3	U.U442UI	3.1	-0.597395	1.5
-	0.091290	-		
4		3.6	0.646835	1.4
	0.015738			

		sepal length (cm)	petal length (cm)
petal length 0		-2.264703	1.4
-0.127706	J • 1	2.201703	4. 1
1	4.9	-2.080961	1.4
-0.234609			
2	4.7	-2.364229	1.3
0.044201		0.000004	1 5
3 0.091290	4.6	-2.299384	1.5
4	5.0	-2.389842	1.4
0.015738		2,003012	
shape (150, 8)		

Accuracy= 0.		66666666	
Confusion Mat	rix		
[[50 0 0]			
[0 45 5] [0 9 41]]			
Status: Improv	ed		
=			
realures pel	aı lengt	h (cm) petal lend	rth (cm) petal width
(cm) petal w	_	=	gth (cm) petal width
-	idth (cm	=	th (cm) petal width 0.2
(cm) petal w	idth (cm	.) \	-
(cm) petal w	idth (cm	.) \	-
(cm) petal w 0 -0.024168 1 -0.103007	idth (cm 1.4 1.4	-0.127706 -0.234609	0.2
(cm) petal w 0 -0.024168 1 -0.103007 2	idth (cm 1.4	-0.127706	0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377	idth (cm 1.4 1.4	-0.127706 -0.234609 0.044201	0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3	idth (cm 1.4 1.4	-0.127706 -0.234609	0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956	idth (cm 1.4 1.4 1.3	-0.127706 -0.234609 0.044201 0.091290	0.2 0.2 0.2 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4	idth (cm 1.4 1.4	-0.127706 -0.234609 0.044201	0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956	idth (cm 1.4 1.4 1.3	-0.127706 -0.234609 0.044201 0.091290	0.2 0.2 0.2 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923	idth (cm 1.4 1.4 1.3 1.5	-0.127706 -0.234609 0.044201 0.091290 0.015738	0.2 0.2 0.2 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923	idth (cm 1.4 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738	0.2 0.2 0.2 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923 sepal leng	idth (cm 1.4 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738	0.2 0.2 0.2 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923 sepal leng petal width (0 -0.024168	idth (cm 1.4 1.4 1.3 1.5 1.4 th (cm) cm) 5.1	-0.127706 -0.234609 0.044201 0.091290 0.015738 sepal length (cm) -2.264703	0.2 0.2 0.2 0.2 0.2 petal width (cm) 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923 sepal leng petal width (0 -0.024168 1	idth (cm 1.4 1.4 1.3 1.5 1.4	-0.127706 -0.234609 0.044201 0.091290 0.015738 sepal length (cm)	0.2 0.2 0.2 0.2 0.2 petal width (cm)
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923 sepal leng petal width (0 -0.024168 1 -0.103007	idth (cm 1.4 1.4 1.3 1.5 1.4 th (cm) cm) 5.1	-0.127706 -0.234609 0.044201 0.091290 0.015738 sepal length (cm) -2.264703 -2.080961	0.2 0.2 0.2 0.2 0.2 petal width (cm) 0.2 0.2
(cm) petal w 0 -0.024168 1 -0.103007 2 -0.028377 3 0.065956 4 0.035923 sepal leng petal width (0 -0.024168 1	idth (cm 1.4 1.4 1.3 1.5 1.4 th (cm) cm) 5.1	-0.127706 -0.234609 0.044201 0.091290 0.015738 sepal length (cm) -2.264703	0.2 0.2 0.2 0.2 0.2 petal width (cm) 0.2

3 0.065956	4.6	-2.299384	0.2
	5 0	-2.389842	0.2
0.035923	J. 0	-2.309042	0.2
shape (150, 8)			
Shape (130, 6)			
*****	*****		
Accuracy= 0.9			
Confusion Matr	ix		
[[50 0 0]			
[0 45 5]			
[0 10 40]]			
Pr[accept] = 1.0)		
Random uniform	: 0.6841915	5595333996	
Status: Accepted	d		
Features petal	l length (d	cm) petal length (cm	n) sepal width
(cm) sepal wid	dth (cm) \	\	
0	1.4	-0.127706	3.5
0.480027			
1	1.4	-0.234609	3.0
-0.674134			
2	1.3	0.044201	3.2
-0.341908			
3	1.5	0.091290	3.1
-0.597395			
4	1.4	0.015738	3.6
0.646835			
<pre>petal width width (cm)</pre>	(cm) peta	al width (cm) sepal	width (cm) sepal
0	0.2	-0.024168	3.5
0.480027			
1	0.2	-0.103007	3.0
-0.674134			
2	0.2	-0.028377	3.2
-0.341908			
3	0.2	0.065956	3.1
-0.597395	· -		
4	0.2	0.035923	3.6
0.646835	· · ·	• • • • • • • • • • • • • • • • • • • •	· · ·
final shape (1)	50 8)		
TIME SMape (I.	JO, O)		

```
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
0
             5.1 -2.264703
                                            0.2
-0.024168
             4.9 -2.080961
                                            0.2
-0.103007
             4.7 -2.364229
                                            0.2
2
-0.028377
             4.6 -2.299384
                                            0.2
0.065956
             5.0 -2.389842
                                            0.2
0.035923
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
             3.5 0.480027
                                        0.2
\cap
-0.024168
             3.0 -0.674134
                                            0.2
1
-0.103007
2
             3.2 -0.341908
                                            0.2
-0.028377
             3.1 -0.597395
                                            0.2
3
0.065956
                                       0.2
             3.6 0.646835
0.035923
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
                                            5.1
             1.4
                     -0.127706
```

-2.264703

```
-2.080961
            1.3
                        0.044201
                                              4.7
2
    -2.364229
3
            1.5
                        0.091290
                                              4.6
    -2.299384
            1.4
                    0.015738
                                              5.0
4
    -2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm) \
            3.5 0.480027
                                     0.2
-0.024168
            3.0 -0.674134
                                         0.2
-0.103007
            3.2
                   -0.341908
                                         0.2
2
-0.028377
3
            3.1 -0.597395
                                         0.2
0.065956
            3.6 0.646835 0.2
0.035923
  sepal length (cm) sepal length (cm)
            5.1
                   -2.264703
0
1
            4.9
                    -2.080961
2
            4.7
                    -2.364229
3
            4.6
                    -2.299384
            5.0
                    -2.389842
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal width
(cm) sepal width (cm) \
            5.1 -2.264703
                                         3.5
0.480027
            4.9 -2.080961
                                         3.0
-0.674134
```

1.4 -0.234609

1

4.9

2	4.7	-2.364229	3.2
-0.341908 3	4.6	-2.299384	3.1
-0.597395 4	5.0	-2.389842	3.6
0.646835			
sepal width width (cm)	(cm) sep	al width (cm) petal	width (cm) petal
0 -0.024168	3.5	0.480027	0.2
1 -0.103007	3.0	-0.674134	0.2
2 -0.028377	3.2	-0.341908	0.2
3 0.065956	3.1	-0.597395	0.2
4 0.035923	3.6	0.646835	0.2
shape (150, 8)			
*****	*****		
Accuracy= 0.9		33333	
Confusion Matr [[50 0 0]	lX		
[0 48 2]			
[0 11 39]]			
Status: Improve	d		
		cm) sepal length (cm	n) sepal width
(cm) sepal wi			
0	5.1	-2.264703	3.5
0.480027			
1	4.9	-2.080961	3.0
-0.674134			
2	4.7	-2.364229	3.2
-0.341908	1 6	0.000004	2 1
3	4.6	-2.299384	3.1
-0.597395	5 0	2 200042	2 6
4	5.0	-2.389842	3.6
0.646835			

sepal width (cm) sepal width (cm) petal length (cm) petal length (cm) $\,$

0 -0.127706	3.5	0.480027	1.4
1 -0.234609	3.0	-0.674134	1.4
2 0.044201	3.2	-0.341908	1.3
3 0.091290	3.1	-0.597395	1.5
4 0.015738	3.6	0.646835	1.4
shape (150, 8)			
********** Accuracy= 0.9 Confusion Matr [[50 0 0] [0 48 2] [0 11 39]] Status:Improve	1333333333 ix	33333	
Features sepa	l width (c	m) sepal width (cm)	sepal width (cm)
sepal width (c 0 0.480027		0.480027	3.5
1 -0.674134	3.0	-0.674134	3.0
2 -0.341908	3.2	-0.341908	3.2
3 -0.597395	3.1	-0.597395	3.1
4 0.646835	3.6	0.646835	3.6
petal width sepal length (-	al width (cm) sepal	length (cm)
0 -2.264703	0.2	-0.024168	5.1
1 -2.080961	0.2	-0.103007	4.9
2 -2.364229	0.2	-0.028377	4.7
3 -2.299384	0.2	0.065956	4.6
4 -2.389842	0.2	0.035923	5.0

shape (150, 8)

*****	*****				
Accuracy= 0.9	2				
Confusion Matr	ix				
[[50 0 0]					
[0 48 2]					
[0 10 40]]					
Status: Improve	d				
Features peta	l length	(cm) petal ler	ngth (cm)	sepal	length
(cm) sepal le	ngth (cm) \			
0	1.4	-0.127706		5.1	
-2.264703					
1	1.4	-0.234609		4.9	
-2.080961					
2	1.3	0.044201	-		4.7
-2.364229					
3	1.5	0.091290)		4.6
-2.299384					
4	1.4	0.015738	}		5.0
-2.389842					
sepal lengt	h (cm)	sepal length (cm	n) petal	length	(cm)
petal length (cm)				
0	5.1	-2.264703		1.4	
-0.127706					
1	4.9	-2.080961		1.4	
-0.234609					
2	4.7	-2.364229		1.3	
0.044201					
3	4.6	-2.299384		1.5	
0.091290					
4	5.0	-2.389842		1.4	
0.015738					
shape (150, 8)					
*****	*****				
Accuracy= 0.9		6666666			
Confusion Matr	ix				
[[50 0 0]					
[0 45 5]					
[0 9 41]]					
Status: Improve	d				

Features peta (cm) sepal le		m) petal width (cm) sep	pal length
0 -2.264703	0.2	-0.024168	5.1
1 -2.080961	0.2	-0.103007	4.9
2 -2.364229	0.2	-0.028377	4.7
3 -2.299384	0.2	0.065956	4.6
4 -2.389842	0.2	0.035923	5.0
petal width petal length (al width (cm) petal lend	gth (cm)
0 -0.127706	0.2	-0.024168	1.4
1 -0.234609	0.2	-0.103007	1.4
2 0.044201	0.2	-0.028377	1.3
3 0.091290	0.2	0.065956	1.5
4 0.015738	0.2	0.035923	1.4
shape (150, 8)			
**************************************		66666	
Confusion Matr			
[0 47 3] [0 11 39]]			
Status: Improve			
Features peta (cm) sepal wi	=	cm) petal length (cm) s	sepal width
0 0.480027		-0.127706	3.5
1 -0.674134	1.4	-0.234609	3.0
2	1.3	0.044201	3.2
-0.341908 3 -0.597395	1.5	0.091290	3.1

```
0.015738
0.646835
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm)
            0.2
                    -0.024168
                                          0.2
-0.024168
                   -0.103007
            0.2
                                          0.2
-0.103007
                                          0.2
            0.2
                  -0.028377
-0.028377
            0.2 0.065956
                                     0.2
3
0.065956
                                      0.2
            0.2 0.035923
0.035923
shape (150, 8)
******
Confusion Matrix
[[50 0 0]]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2
                -0.024168
                                          3.5
0.480027
            0.2
                    -0.103007
                                          3.0
-0.674134
2
            0.2
                    -0.028377
                                          3.2
-0.341908
            0.2
                  0.065956
                                      3.1
-0.597395
            0.2 0.035923
                                      3.6
4
0.646835
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm)
            5.1 -2.264703
                                          5.1
-2.264703
                                          4.9
            4.9 -2.080961
-2.080961
```

3.6

1.4

4

```
2
            4.7 -2.364229
                                           4.7
-2.364229
                   -2.299384
                                           4.6
3
             4.6
-2.299384
             5.0 -2.389842
                                           5.0
-2.389842
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.1277541660137893
Status: Accepted
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
\cap
            0.2
                    -0.024168
                                           5.1
-2.264703
             0.2 -0.103007
                                           4.9
-2.080961
2
             0.2 -0.028377
                                           4.7
-2.364229
             0.2 0.065956
                                           4.6
3
-2.299384
             0.2 0.035923
                                           5.0
-2.389842
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm)
                                           5.1
             1.4
                    -0.127706
-2.264703
             1.4 -0.234609
                                           4.9
1
-2.080961
2
             1.3
                                                4.7
                          0.044201
    -2.364229
3
             1.5
                         0.091290
                                                4.6
   -2.299384
                                                5.0
             1.4
                         0.015738
    -2.389842
final shape (150, 8)
```

```
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 9 41]]
Pr[accept] = 1.0
Random uniform: 0.8359716064687146
Status: Accepted
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
                  -0.024168
                                             3.5
0
             0.2
0.480027
             0.2
                   -0.103007
                                             3.0
-0.674134
             0.2
                    -0.028377
                                             3.2
-0.341908
             0.2
                     0.065956
                                        3.1
-0.597395
             0.2
                   0.035923
                                        3.6
0.646835
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm) \
             0.2
                    -0.024168
                                             3.5
0.480027
             0.2
                    -0.103007
                                             3.0
1
-0.674134
             0.2
                    -0.028377
                                             3.2
2
-0.341908
3
             0.2
                     0.065956
                                        3.1
-0.597395
                                        3.6
             0.2
                     0.035923
0.646835
  sepal length (cm) sepal length (cm)
0
             5.1
                      -2.264703
1
             4.9
                      -2.080961
2
             4.7
                      -2.364229
             4.6
3
                      -2.299384
             5.0
                      -2.389842
```

final shape (150, 10)

```
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.7597559562512424
Status: Accepted
Features sepal width (cm) sepal width (cm) petal length
(cm) petal length (cm) \
             3.5
                    0.480027
                                            1.4
-0.127706
             3.0 -0.674134
                                            1.4
-0.234609
             3.2
                    -0.341908
                                            1.3
2
    0.044201
             3.1
                   -0.597395
                                            1.5
3
    0.091290
4
             3.6 0.646835
                                            1.4
    0.015738
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm)
             5.1 -2.264703
                                            5.1
0
-2.264703
             4.9
                   -2.080961
                                            4.9
-2.080961
                                            4.7
             4.7
                    -2.364229
-2.364229
3
             4.6
                    -2.299384
                                            4.6
-2.299384
             5.0 -2.389842
                                            5.0
-2.389842
final shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
```

Status: Improved

```
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
             3.5
                 0.480027
                                             5.1
-2.264703
             3.0 -0.674134
                                             4.9
-2.080961
             3.2 -0.341908
                                             4.7
2
-2.364229
             3.1
                     -0.597395
                                             4.6
-2.299384
             3.6 0.646835
                                             5.0
-2.389842
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm)
             0.2
                     -0.024168
                                             0.2
-0.024168
             0.2
                    -0.103007
                                             0.2
1
-0.103007
             0.2
                   -0.028377
                                             0.2
-0.028377
             0.2 0.065956
                                        0.2
3
0.065956
                                        0.2
             0.2 0.035923
0.035923
shape (150, 8)
******
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 0.9432780711167889
Random uniform: 0.5320194695574249
Status: Accepted
Features petal width (cm) petal width (cm) petal length
(cm) petal length (cm) \
             0.2
                     -0.024168
                                             1.4
-0.127706
             0.2
                   -0.103007
1
                                             1.4
-0.234609
2
             0.2 -0.028377
                                             1.3
   0.044201
```

3	0.2	0.065956	1.5
0.091290 4 0.015738	0.2	0.035923	1.4
sepal width		al width (cm) sepal leng	th (cm)
0 -2.264703	3.5	0.480027	5.1
1 -2.080961	3.0	-0.674134	4.9
2 -2.364229	3.2	-0.341908	4.7
3 -2.299384	3.1	-0.597395	4.6
4 -2.389842	3.6	0.646835	5.0
final shape (1	50, 8)		
*****	*****		
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 45 5] [0 10 40]]			
<pre>Pr[accept] = 1. Random uniform</pre>		1352745376	
Status: Accepte	d		
Features peta (cm) petal wi		cm) petal length (cm) p \	etal width
0 -0.024168	1.4	-0.127706	0.2
1 -0.103007	1.4	-0.234609	0.2
2 -0.028377	1.3	0.044201	0.2
3 0.065956	1.5	0.091290	0.2
4 0.035923	1.4	0.015738	0.2
sepal lengt	h (cm) se _l	pal length (cm) petal wi	dth (cm)

petal width (cm)

0	5.1	-2.264703	0.2
-0.024168		0.000061	0.0
1	4.9	-2.080961	0.2
-0.103007 2	4.7	-2.364229	0.2
-0.028377	4./	-2.304229	0.2
3	4.6	-2.299384	0.2
0.065956			
4	5.0	-2.389842	0.2
0.035923			
final shape (1	.50, 8)		

Accuracy= 0.9		33333	
Confusion Matr	Cix		
[[50 0 0]			
[0 48 2] [0 11 39]]			
Status: Improve	p.d		
=		m) petal width (cm)	sepal width (cm)
sepal width (c		, 1	1 , ,
0	0.2	-0.024168	3.5
0.480027			
1	0.2	-0.103007	3.0
-0.674134			
2	0.2	-0.028377	3.2
-0.341908		0.065056	
3	0.2	0.065956	3.1
-0.597395 4	0.2	0.035923	3.6
0.646835	0.2	0.033923	3.0
0.040033			
sepal width	ı (cm) sep	al width (cm) petal	length (cm)
petal length (-	, , <u>,</u>	
0	3.5	0.480027	1.4
-0.127706			
1	3.0	-0.674134	1.4
-0.234609			
2	3.2	-0.341908	1.3
0.044201	2 1	0 507005	1 5
3	3.1	-0.597395	1.5
0.091290	3.6	0.646835	1.4
0.015738	٥.٥	0.040033	1.4
0.013/30			

shape (150, 8)

Status: Improved

```
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 9 41]]
Status: Improved
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
                   -0.127706
                                         0.2
            1.4
-0.024168
            1.4 -0.234609
                                         0.2
-0.103007
            1.3
                        0.044201
                                         0.2
2
-0.028377
3
            1.5
                        0.091290
                                        0.2
0.065956
            1.4
                        0.015738
                                         0.2
0.035923
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
            0.2 -0.024168
                                         3.5
0
0.480027
            0.2 -0.103007
                                         3.0
-0.674134
            0.2
                                         3.2
                   -0.028377
-0.341908
3
            0.2
                  0.065956
                                    3.1
-0.597395
            0.2 0.035923
                                     3.6
0.646835
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 11 39]]
```

```
(cm) petal length (cm) \
            1.4
                 -0.127706
                                           1.4
-0.127706
            1.4 -0.234609
                                           1.4
-0.234609
            1.3
                         0.044201
                                               1.3
2
    0.044201
3
            1.5
                         0.091290
                                               1.5
    0.091290
4
            1.4
                        0.015738
                                               1.4
    0.015738
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
                 -2.264703
                                           0.2
            5.1
-0.024168
1
            4.9
                   -2.080961
                                           0.2
-0.103007
            4.7 -2.364229
                                           0.2
-0.028377
            4.6 -2.299384
                                           0.2
3
0.065956
            5.0 -2.389842
                                           0.2
0.035923
  sepal length (cm) sepal length (cm)
0
             5.1
                    -2.264703
1
            4.9
                     -2.080961
2
            4.7
                     -2.364229
3
            4.6
                     -2.299384
             5.0
                    -2.389842
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 8 42]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
```

Features petal length (cm) petal length (cm) petal length

```
0.2
           5.1 -2.264703
-0.024168
            4.9 -2.080961
                                         0.2
-0.103007
            4.7 -2.364229
                                         0.2
2
-0.028377
            4.6 -2.299384
                                         0.2
3
0.065956
            5.0 -2.389842
                                         0.2
0.035923
  sepal width (cm) sepal width (cm) petal length (cm)
petal length (cm) \
            3.5 0.480027
                                         1.4
-0.127706
            3.0 -0.674134
                                         1.4
1
-0.234609
2
            3.2 -0.341908
                                         1.3
    0.044201
3
            3.1 -0.597395
                                         1.5
   0.091290
            3.6 0.646835
                                         1.4
4
   0.015738
  petal length (cm) petal length (cm)
0
            1.4
                   -0.127706
            1.4 -0.234609
1
2
            1.3
                        0.044201
3
            1.5
                       0.091290
                        0.015738
            1.4
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
            5.1 -2.264703
                                         0.2
-0.024168
```

0

1	4.9	-2.080961	0.2
-0.103007 2 -0.028377	4.7	-2.364229	0.2
3 0.065956	4.6	-2.299384	0.2
4 0.035923	5.0	-2.389842	0.2
0.000320			
petal leng sepal width	-	petal length (cm) s	epal width (cm)
0 0.480027		-0.127706	3.5
1 -0.674134	1.4	-0.234609	3.0
2 -0.341908	1.3	0.044201	3.2
3 -0.597395	1.5	0.091290	3.1
4 0.646835	1.4	0.015738	3.6
shape (150, 8	3)		
*******		*	
Accuracy= 0. Confusion Mat			
[[50 0 0]			
[0 48 2]			
[0 10 40]]	1		
Status: Improv		h (cm) petal length	(cm) senal length
(cm) sepal I	_	-	(Cm) Separ rengen
0	-	-0.127706	5.1
-2.264703			
1	1.4	-0.234609	4.9
-2.080961	1 2	0 044001	4 7
2 -2.36422	1.3	0.044201	4.7
3	1.5	0.091290	4.6
-2.29938			
4 -2.38984	1.4 12	0.015738	5.0

=	(cm) sep	al width (cm)	petal width (cm) petal
width (cm) O	3.5	0.480027	0.2
-0.024168 1	3.0	-0.674134	0.2
-0.103007 2	2 2	0 241000	0.0
-0.028377	3.2	-0.341908	0.2
3 0.065956	3.1	-0.597395	0.2
4	3.6	0.646835	0.2
0.035923 shape (150, 8)			
*****	*****		
Accuracy= 0.9	0666666666	66666	
Confusion Matr	ix		
[[50 0 0]			
[0 47 3]			
[0 11 39]]			
Status: Improve	d		
			ngth (cm) petal length
(cm) petal le			
0	5.1	-2.264703	1.4
-0.127706 1	4 0	2 000061	1 /
-0.234609	4.9	-2.080961	1.4
2	1 7	-2.364229	1.3
0.044201	4./	-2.304229	1.3
3	4.6	-2.299384	1.5
0.091290	1.0	2.233301	1.0
4	5.0	-2.389842	1.4
0.015738			
sepal lengt	h (cm) se	pal length (c	m) petal width (cm)
petal width (c			-
0	5.1	-2.264703	0.2
-0.024168			
1	4.9	-2.080961	0.2
-0.103007			
2	4.7	-2.364229	0.2
-0.028377			
3	4.6	-2.299384	0.2
0.065956			

```
5.0 -2.389842
                                          0.2
0.035923
  sepal width (cm) sepal width (cm)
0
            3.5
                  0.480027
            3.0
                     -0.674134
1
2
            3.2
                     -0.341908
3
            3.1
                     -0.597395
            3.6
                    0.646835
shape (150, 10)
****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal length
(cm) petal length (cm) \
            5.1
                   -2.264703
                                          1.4
-0.127706
            4.9 -2.080961
                                          1.4
-0.234609
2
            4.7 -2.364229
                                          1.3
    0.044201
3
            4.6 -2.299384
                                          1.5
    0.091290
            5.0 -2.389842
                                          1.4
4
   0.015738
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm)
                                           0.2
            5.1
                 -2.264703
-0.024168
            4.9 -2.080961
                                           0.2
1
-0.103007
            4.7
                  -2.364229
                                          0.2
-0.028377
            4.6 -2.299384
3
                                          0.2
0.065956
            5.0 -2.389842
                                          0.2
0.035923
shape (150, 8)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) petal length
(cm) petal length (cm) \
0
           0.2
                -0.024168
                                          1.4
-0.127706
            0.2 -0.103007
                                          1.4
1
-0.234609
            0.2 -0.028377
                                          1.3
   0.044201
            0.2 0.065956
3
                                          1.5
   0.091290
            0.2 0.035923
4
                                          1.4
   0.015738
  sepal width (cm) sepal width (cm) sepal width (cm) sepal
width (cm) \
            3.5 0.480027
                                      3.5
0.480027
            3.0 -0.674134
                                          3.0
-0.674134
            3.2 -0.341908
                                          3.2
2
-0.341908
            3.1 -0.597395
                                          3.1
-0.597395
            3.6 0.646835
                                     3.6
0.646835
  petal width (cm) petal width (cm)
            0.2
0
                   -0.024168
1
            0.2
                     -0.103007
2
            0.2
                     -0.028377
3
            0.2
                    0.065956
            0.2
                   0.035923
shape (150, 10)
```

Accuracy= 0.92

```
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
0
            0.2
                -0.024168
                                           5.1
-2.264703
                                           4.9
            0.2 -0.103007
-2.080961
            0.2 -0.028377
                                           4.7
2
-2.364229
3
            0.2 0.065956
                                           4.6
-2.299384
            0.2 0.035923
                                           5.0
-2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm) \
\cap
            3.5 0.480027
                                      0.2
-0.024168
            3.0 -0.674134
                                           0.2
1
-0.103007
2
            3.2 -0.341908
                                           0.2
-0.028377
            3.1 -0.597395
                                           0.2
3
0.065956
                                      0.2
            3.6 0.646835
0.035923
  petal length (cm) petal length (cm)
                     -0.127706
0
            1.4
1
            1.4
                     -0.234609
2
            1.3
                         0.044201
3
            1.5
                         0.091290
            1.4
                         0.015738
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
```

[0 46 4]

```
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
                                          0.2
0
            5.1 -2.264703
-0.024168
            4.9 -2.080961
                                          0.2
1
-0.103007
            4.7 -2.364229
                                          0.2
-0.028377
            4.6 -2.299384
                                          0.2
0.065956
            5.0 -2.389842
                                          0.2
0.035923
  sepal width (cm) sepal width (cm) petal length (cm)
petal length (cm) \
                0.480027
            3.5
0
                                          1.4
-0.127706
            3.0 -0.674134
                                          1.4
-0.234609
            3.2 -0.341908
                                          1.3
2
   0.044201
            3.1 -0.597395
                                          1.5
    0.091290
4
            3.6 0.646835
                                          1.4
   0.015738
 petal width (cm) petal width (cm)
            0.2
                    -0.024168
0
1
            0.2
                    -0.103007
2
            0.2
                     -0.028377
3
            0.2
                    0.065956
            0.2
                    0.035923
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
```

Status: Improved

```
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
             0.2
                  -0.024168
                                            5.1
-2.264703
             0.2 -0.103007
                                            4.9
-2.080961
             0.2 -0.028377
                                            4.7
2
-2.364229
             0.2 0.065956
                                            4.6
-2.299384
             0.2 0.035923
                                            5.0
-2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
             3.5 0.480027
                                        0.2
-0.024168
1
             3.0 -0.674134
                                            0.2
-0.103007
             3.2 -0.341908
                                            0.2
-0.028377
                                            0.2
3
             3.1 -0.597395
0.065956
                                       0.2
             3.6 0.646835
0.035923
shape (150, 8)
******
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.5286211996330776
Status: Accepted
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
             0.2
                     -0.024168
                                            5.1
-2.264703
             0.2
                   -0.103007
                                            4.9
1
-2.080961
             0.2 -0.028377
                                            4.7
-2.364229
```

3 -2.299384	0.2	0.065956	4.6	
4 -2.389842	0.2	0.035923	5.0	
petal lengt	h (cm) pe	tal length (cr	m) sepal length ((cm)
sepal length (
0 -2.264703	1.4	-0.127706	5.1	
1 -2.080961	1.4	-0.234609	4.9	
2	1.3	0.04420	1	4.7
-2.364229				
3 -2.299384	1.5	0.09129	0	4.6
4	1.4	0.01573	8	5.0
-2.389842				
final shape (1	50, 8)			
*****	****			
Accuracy= 0.9		66666		
Confusion Matr	ix			
[[50 0 0]				
[0 48 2] [0 9 41]]				
Status: Improve	d			
_		cm) sepal le	ngth (cm) petal w	idt.h
(cm) petal wi			y e (e,	0. 0.1
0			0.2	
-0.024168				
1	4.9	-2.080961	0.2	
-0.103007				
2	4.7	-2.364229	0.2	
-0.028377				
3	4.6	-2.299384	0.2	
0.065956	F 0	0 200040	0.0	
4	5.0	-2.389842	0.2	
0.035923				
petal width	(cm) pet	al width (cm)	sepal length (cm	ı)
sepal length (cm)			
0	0.2	-0.024168	5.1	
-2.264703				

1 -2.080961	0.2	-0.103007	4.9			
2 -2.364229	0.2	-0.028377	4.7			
3 -2.299384	0.2	0.065956	4.6			
4 -2.389842	0.2	0.035923	5.0			
shape (150, 8)						

Accuracy= 0.9 Confusion Matr						
[[50 0 0]	TV					
[0 49 1]						
[0 11 39]]						
Status:Improve						
Features sepa (cm) petal le		m) sepal width (cm)	petal length			
(Cm) petar re	3.5		1.4			
-0.127706	3 . 3	0.100027	1.1			
1	3.0	-0.674134	1.4			
-0.234609						
2	3.2	-0.341908	1.3			
0.044201	3.1	-0.597395	1.5			
0.091290	3.1	-0.39/393	1.5			
4	3.6	0.646835	1.4			
0.015738						
sepal width (cm) sepal width (cm) petal width (cm) petal						
width (cm)	(CIII) Sep	ai width (cm) petai	width (cm) petai			
0	3.5	0.480027	0.2			
-0.024168						
1	3.0	-0.674134	0.2			
-0.103007	2 2	0.041000	0.0			
2 -0.028377	3.2	-0.341908	0.2			
3	3.1	-0.597395	0.2			
0.065956						
4	3.6	0.646835	0.2			
0.035923						
shape (150, 8)						

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal length
(cm) petal length (cm) \
             5.1
                  -2.264703
                                             1.4
-0.127706
             4.9 -2.080961
1
                                            1.4
-0.234609
             4.7
                     -2.364229
                                            1.3
    0.044201
                     -2.299384
                                            1.5
3
             4.6
   0.091290
4
             5.0 -2.389842
                                            1.4
    0.015738
  petal length (cm) petal length (cm) petal width (cm)
petal width (cm) \
             1.4 -0.127706
                                             0.2
-0.024168
             1.4 -0.234609
                                             0.2
1
-0.103007
             1.3
                          0.044201
                                            0.2
-0.028377
             1.5
                                            0.2
                          0.091290
0.065956
             1.4
                          0.015738
                                            0.2
0.035923
  petal width (cm) petal width (cm)
0
             0.2
                      -0.024168
             0.2
1
                      -0.103007
2
             0.2
                      -0.028377
3
             0.2
                      0.065956
             0.2
                     0.035923
shape (150, 10)
```

Confusion Matrix

```
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) petal length
(cm) petal length (cm) \
             0.2
                   -0.024168
                                            1.4
-0.127706
             0.2 -0.103007
                                            1.4
-0.234609
2
             0.2
                     -0.028377
                                            1.3
    0.044201
3
             0.2
                   0.065956
                                            1.5
    0.091290
             0.2 0.035923
4
                                            1.4
    0.015738
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm)
             5.1
                -2.264703
                                            0.2
-0.024168
             4.9
                    -2.080961
                                            0.2
1
-0.103007
             4.7
                    -2.364229
                                            0.2
-0.028377
3
             4.6
                    -2.299384
                                            0.2
0.065956
             5.0 -2.389842
                                            0.2
0.035923
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
0
             3.5
                     0.480027
                                            5.1
-2.264703
             3.0 -0.674134
                                            4.9
-2.080961
```

2	3.2	-0.341908	4.7				
-2.364229 3	3.1	-0.597395	4.6				
-2.299384 4 -2.389842	3.6	0.646835	5.0				
petal width (cm) petal width (cm) petal length (cm)							
petal length 0 -0.127706		-0.024168	1.4				
1 -0.234609	0.2	-0.103007	1.4				
2 0.044201	0.2	-0.028377	1.3				
3 0.091290	0.2	0.065956	1.5				
4 0.015738		0.035923	1.4				
shape (150, 8)							
********************************* Accuracy= 0.9066666666666666666666666666666666666							
Status: Improved Features sepal length (cm) sepal length (cm) petal length							
(cm) petal le	ength (cm) 5.1	\ -2.264703	1.4				
-0.127706 1 -0.234609	4.9	-2.080961	1.4				
2	4.7	-2.364229	1.3				
0.044201	4.6	-2.299384	1.5				
0.091290	5.0	-2.389842	1.4				
0.015738							

sepal width (cm) sepal width (cm) petal width (cm) petal width (cm)

0 -0.024168	3.5	0.480027	0.2					
1	3.0	-0.674134		0.2				
-0.103007	2 0	0 241000		0 0				
2 -0.028377	3.2	-0.341908		0.2				
3	3.1	-0.597395		0.2				
0.065956								
4	3.6	0.646835	0.2					
0.035923								
shape (150, 8)								

Accuracy= 0.9	1333333333	33333						
Confusion Matr	ix							
[[50 0 0]								
[0 47 3]								
[0 10 40]]								
Status: Improve								
Features petal width (cm) petal width (cm) petal width (cm)								
petal width (c		0 004160		0 0				
0 -0.024168	0.2	-0.024168		0.2				
1	0.2	-0.103007		0.2				
-0.103007	0.2	0.100007		• • •				
2	0.2	-0.028377		0.2				
-0.028377								
3	0.2	0.065956	0.2					
0.065956								
4	0.2	0.035923	0.2					
0.035923								
	1- ()		_ 1 1 _ 1 _ 1					
sepal length (_	tal length (cm) sep	al le	ngth (Cm)				
sepai length (1.4	-0.127706		5.1				
-2.264703	T • I	0.12//00		J.1				
1	1.4	-0.234609		4.9				
-2.080961		0.201000						
2	1.3	0.044201		4.7				
-2.364229								
3	1.5	0.091290		4.6				
-2.299384								
4	1.4	0.015738		5.0				
-2.389842								

```
sepal width (cm) sepal width (cm)
0
             3.5
                    0.480027
1
             3.0
                     -0.674134
2
             3.2
                     -0.341908
3
             3.1
                     -0.597395
             3.6
                    0.646835
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
                    -0.127706
             1.4
                                           5.1
-2.264703
             1.4 -0.234609
                                           4.9
-2.080961
                                                4.7
2
             1.3
                         0.044201
    -2.364229
             1.5
3
                         0.091290
                                                4.6
    -2.299384
             1.4
                         0.015738
                                                5.0
4
    -2.389842
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
0
             3.5 0.480027
                                       0.2
-0.024168
                                           0.2
             3.0
                    -0.674134
-0.103007
                                           0.2
2
             3.2
                   -0.341908
-0.028377
             3.1 -0.597395
                                           0.2
0.065956
             3.6 0.646835
                                0.2
0.035923
shape (150, 8)
```

```
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.04605375260645406
Status: Accepted
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
0
             1.4 -0.127706
                                            1.4
-0.127706
             1.4 -0.234609
                                            1.4
1
-0.234609
             1.3
                                                 1.3
                          0.044201
   0.044201
3
             1.5
                         0.091290
                                                 1.5
   0.091290
             1.4
4
                         0.015738
                                                 1.4
   0.015738
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm)
             0.2 -0.024168
                                            0.2
-0.024168
             0.2 -0.103007
                                            0.2
-0.103007
             0.2 -0.028377
                                            0.2
2
-0.028377
             0.2 0.065956 0.2
0.065956
             0.2 0.035923
                                       0.2
0.035923
final shape (150, 8)
******
Accuracy= 0.91333333333333333
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) petal width (cm)
petal width (cm) \
```

0	3.5	0.480027	0.2
-0.024168	3.0	-0.674134	0.2
1 -0.103007	3.0	-0.6/4134	0.2
2	3.2	-0.341908	0.2
-0.028377	2 1	0 507205	0. 0
3 0.065956	3.1	-0.597395	0.2
4	3.6	0.646835	0.2
0.035923			
petal width	(cm) pet	al width (cm) petal	length (cm)
petal length (=	(3,7,1,3,3,	- 5 - (- ,
0	0.2	-0.024168	1.4
-0.127706			
1	0.2	-0.103007	1.4
-0.234609			1 0
2 0.044201	0.2	-0.028377	1.3
3	0.2	0.065956	1.5
0.091290	0.2	0.000930	1.5
4	0.2	0.035923	1.4
0.015738			
shape (150, 8)			

		2222	
Accuracy= 0.9 Confusion Matr		33333	
[[50 0 0]	1 A		
[0 46 4]			
[0 9 41]]			
Status:Improve	d		
Features sepa	l length (cm) sepal length (cr	n) sepal width
(cm) sepal wi			
0	5.1	-2.264703	3.5
0.480027	4 0	2 000061	2 0
1 -0.674134	4.9	-2.080961	3.0
2	4.7	-2.364229	3.2
-0.341908	± • /	2.001229	J • 2
3	4.6	-2.299384	3.1
-0.597395			
4	5.0	-2.389842	3.6
0.646835			

```
petal width (cm) petal width (cm) sepal length (cm)
sepal length (cm)
            0.2
                 -0.024168
                                          5.1
-2.264703
            0.2
                                          4.9
                    -0.103007
-2.080961
            0.2
                   -0.028377
                                          4.7
-2.364229
            0.2 0.065956
                                          4.6
-2.299384
            0.2 0.035923
                                          5.0
-2.389842
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
0
            0.2 -0.024168
                                          3.5
0.480027
            0.2 -0.103007
                                          3.0
1
-0.674134
            0.2
                    -0.028377
                                          3.2
-0.341908
3
            0.2
                   0.065956
                                     3.1
-0.597395
            0.2 0.035923
                                      3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
            5.1 -2.264703
                                          1.4
0
-0.127706
            4.9 -2.080961
                                          1.4
-0.234609
            4.7 -2.364229
                                          1.3
    0.044201
```

3	4.6	-2.299384	1.5
0.091290	5.0	-2.389842	1.4
0.015738			
shape (150, 8)			
*****	****		
Accuracy= 0.9 Confusion Matr	iv		
[[50 0 0]	TV		
[0 45 5]			
[0 10 40]]			
Pr[accept] = 1.	0		
Random uniform		15639551151	
Status: Accepte			
-		cm) sepal length (cr	m) sepal length
(cm) sepal le			, sopar religeli
0	=	-2.264703	5.1
-2.264703			
1	4.9	-2.080961	4.9
-2.080961			
2	4.7	-2.364229	4.7
-2.364229			
3	4.6	-2.299384	4.6
-2.299384			
4	5.0	-2.389842	5.0
-2.389842			
notal width	(am) not	al width (cm) sepal	width (am) sonal
width (cm)			
0	0.2	-0.024168	3.5
0.480027		0.100005	2 2
1	0.2	-0.103007	3.0
-0.674134	0 0	0.000000	2 0
2	0.2	-0.028377	3.2
-0.341908	0 0	0.065056	2 1
3	0.2	0.065956	3.1
-0.597395	0 2	0 025022	3.6
0 646925	0.2	0.035923	٥.٥
0.646835	50 01		
final shape (1	JU, 0)		
	als also de also de also de		

```
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) petal width (cm)
petal width (cm) \
            3.5 0.480027
0
                                      0.2
-0.024168
                                          0.2
            3.0 -0.674134
-0.103007
            3.2 -0.341908
                                          0.2
2
-0.028377
            3.1 -0.597395
                                          0.2
0.065956
            3.6 0.646835
                                     0.2
0.035923
  sepal width (cm) sepal width (cm) petal width (cm) petal
width (cm)
            3.5 0.480027
                                      0.2
\cap
-0.024168
            3.0 -0.674134
                                          0.2
-0.103007
2
                                          0.2
            3.2 -0.341908
-0.028377
            3.1 -0.597395
                                          0.2
3
0.065956
                                     0.2
            3.6 0.646835
0.035923
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal length
(cm) sepal length (cm) \
                   -2.264703
                                          5.1
            5.1
```

-2.264703

1	4.9	-2.080961	4.9	
-2.080961 2 -2.364229	4.7	-2.364229	4.7	
-2.364229 3 -2.299384	4.6	-2.299384	4.6	
-2.299364 4 -2.389842	5.0	-2.389842	5.0	
petal widt width (cm)	h (cm) pe	tal width (cm) pe	tal width (cm) peta	1
0 -0.024168	0.2	-0.024168	0.2	
1 -0.103007	0.2	-0.103007	0.2	
2 -0.028377	0.2	-0.028377	0.2	
3 0.065956	0.2	0.065956	0.2	
4 0.035923 shape (150, 8		0.035923	0.2	
********** Accuracy= 0. Confusion Mat [[50 0 0] [0 48 2] [0 10 40]] Status:Improv	92 rix ed			
Features sep (cm) petal l		cm) sepal width (cm) petal length	
0 -0.127706		0.480027	1.4	
1 -0.234609	3.0	-0.674134	1.4	
2	3.2	-0.341908	1.3	
0.044201	3.1	-0.597395	1.5	
0.091290 4 0.015738	3.6	0.646835	1.4	

petal width		petal	width	(cm)	sepal	length	(cm)
0 -2.264703	0.2	-0	.02416	8		5.	1
1 -2.080961	0.2	-0	.10300	7		4.	9
2 -2.364229	0.2	-0	.02837	7		4.	7
3 -2.299384	0.2	0.	065956			4.	6
4 -2.389842 shape (150, 8)	0.2	0.	035923			5.	0
*****	****	* *					
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 48 2] [0 10 40]] Status:Improve	rix						
Features sepa	l leng		sepa	l len	gth (cr	m) peta	l width
(cm) petal wi		m) \ -2	.26470	3		0.2	2
-0.024168 1 -0.103007	4.9	-2	.08096	1		0.3	2
2 -0.028377	4.7	-2	.36422	9		0.3	2
3 0.065956	4.6	-2	.29938	4		0.3	2
4 0.035923	5.0	-2	.38984	2		0.3	2
petal lengt		petal	lengt	h (cm)) peta	al width	(cm)
0	1.4	-0	.12770	6		0.3	2
-0.024168 1 -0.103007	1.4	-0	.23460	9		0.3	2
2 -0.028377	1.3		0.0	44201		0.3	2
3 0.065956	1.5		0.0	91290		0.3	2

```
1.4
                                       0.2
                      0.015738
0.035923
shape (150, 8)
*****
Confusion Matrix
[[50 0 01]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
           1.4
                  -0.127706
                                       5.1
-2.264703
           1.4 -0.234609
                                       4.9
-2.080961
2
           1.3
                      0.044201
                                           4.7
   -2.364229
3
           1.5
                 0.091290
                                           4.6
   -2.299384
           1.4
                      0.015738
                                           5.0
4
   -2.389842
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
           0.2 -0.024168
                                       3.5
0.480027
           0.2
                  -0.103007
                                       3.0
-0.674134
2
           0.2
                  -0.028377
                                       3.2
-0.341908
            0.2 0.065956
                                   3.1
-0.597395
           0.2 0.035923
                                   3.6
4
0.646835
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
```

[0 8 42]]

```
Status: Improved
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
0
            1.4
                    -0.127706
                                           1.4
-0.127706
            1.4 -0.234609
                                           1.4
-0.234609
2
            1.3
                         0.044201
                                               1.3
    0.044201
            1.5
3
                         0.091290
                                               1.5
    0.091290
            1.4
                     0.015738
4
                                               1.4
   0.015738
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm)
            0.2 -0.024168
                                           0.2
-0.024168
             0.2
                    -0.103007
                                           0.2
-0.103007
            0.2
                    -0.028377
                                           0.2
2
-0.028377
            0.2 0.065956
                                      0.2
3
0.065956
            0.2 0.035923
                                      0.2
0.035923
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
0
            3.5
                0.480027
                                           5.1
-2.264703
                                           4.9
            3.0 -0.674134
-2.080961
            3.2 -0.341908
                                           4.7
-2.364229
```

```
3
             3.1 -0.597395
                                            4.6
-2.299384
             3.6 0.646835
                                            5.0
-2.389842
  petal length (cm) petal length (cm) sepal width (cm)
sepal width (cm) \
             1.4 -0.127706
0
                                             3.5
0.480027
             1.4 -0.234609
                                             3.0
-0.674134
             1.3
                                            3.2
2
                          0.044201
-0.341908
             1.5
                          0.091290
                                            3.1
-0.597395
             1.4
                          0.015738
                                            3.6
0.646835
  petal length (cm) petal length (cm)
0
             1.4
                      -0.127706
1
             1.4
                      -0.234609
2
             1.3
                          0.044201
             1.5
                          0.091290
3
             1.4
                          0.015738
shape (150, 10)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
             0.2 -0.024168
                                            3.5
0
0.480027
             0.2 -0.103007
                                             3.0
-0.674134
             0.2 -0.028377
                                            3.2
-0.341908
             0.2 0.065956
                                       3.1
3
-0.597395
```

```
0.646835
  sepal width (cm) sepal width (cm) sepal length (cm)
sepal length (cm)
            3.5 0.480027
                                          5.1
-2.264703
            3.0 -0.674134
                                          4.9
-2.080961
            3.2 -0.341908
                                          4.7
-2.364229
            3.1 -0.597395
                                          4.6
3
-2.299384
            3.6 0.646835
                                          5.0
-2.389842
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal width
(cm) sepal width (cm) \
            5.1 -2.264703
                                          3.5
0.480027
            4.9 -2.080961
                                          3.0
-0.674134
2
            4.7
                   -2.364229
                                          3.2
-0.341908
                                          3.1
            4.6 -2.299384
-0.597395
            5.0 -2.389842
                                          3.6
4
0.646835
  petal width (cm) petal width (cm) petal length (cm)
petal length (cm)
            0.2 -0.024168
                                          1.4
-0.127706
            0.2 -0.103007
                                          1.4
-0.234609
```

0.2 0.035923

3.6

2		0.2	-0.028377	1.3
	0.044201			
3	0.091290	0.2	0.065956	1.5
4	0.091290	0.2	0.035923	1.4
-	0.015738	0.1	0,000,000	_ • •
shap	e (150, 8)			
de de de de	*****	ale de de de de de de de		
	********* racy= 0.9			
	usion Matr			
	0 0]			
	46 4]			
[0	8 42]]			
Stat	us:Improve	d		
Feat	ures peta	l width (c	m) petal width (cm) pet	al length
(cm)	petal le	ngth (cm)		
0		0.2	-0.024168	1.4
	27706	0 0	0 100007	1 4
1	24600	0.2	-0.103007	1.4
-0.2 2	34609	0.2	-0.028377	1.3
۷	0.044201	0.2	-0.020377	1.3
3	0.011201	0.2	0.065956	1.5
-	0.091290			
4		0.2	0.035923	1.4
	0.015738			
	_	_	al width (cm) petal leng	th (cm)
peta. 0	l length (3.5	0.480027	1.4
	27706	3.3	0.400027	1.4
1	27700	3.0	-0.674134	1.4
	34609	3. 3	0.071101	- • •
2		3.2	-0.341908	1.3
	0.044201			
3		3.1	-0.597395	1.5
	0.091290			
4		3.6	0.646835	1.4
	0.015738			
shap	e (150, 8)			
****	*****	****		

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
0
             1.4 -0.127706
                                            1.4
-0.127706
             1.4 -0.234609
                                            1.4
-0.234609
             1.3
                                                1.3
2
                          0.044201
   0.044201
3
             1.5
                          0.091290
                                                 1.5
    0.091290
             1.4
                         0.015738
                                                 1.4
4
   0.015738
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
             5.1 -2.264703
                                            0.2
-0.024168
             4.9 -2.080961
                                            0.2
1
-0.103007
2
             4.7 -2.364229
                                            0.2
-0.028377
             4.6 -2.299384
                                            0.2
3
0.065956
                                            0.2
             5.0 -2.389842
0.035923
  petal width (cm) petal width (cm)
             0.2
0
                      -0.024168
1
             0.2
                      -0.103007
             0.2
2
                     -0.028377
3
             0.2
                     0.065956
             0.2
                     0.035923
shape (150, 10)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
```

[0 47 3]

```
[ 0 9 41]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
                                           5.1
\Omega
            3.5
                0.480027
-2.264703
            3.0 -0.674134
                                          4.9
1
-2.080961
            3.2 -0.341908
                                          4.7
-2.364229
            3.1
                    -0.597395
                                          4.6
-2.299384
            3.6 0.646835
                                          5.0
-2.389842
  petal width (cm) petal width (cm) sepal length (cm)
sepal length (cm)
0
            0.2 -0.024168
                                          5.1
-2.264703
            0.2 -0.103007
                                          4.9
-2.080961
            0.2 -0.028377
                                          4.7
2
-2.364229
            0.2 0.065956
                                          4.6
-2.299384
            0.2 0.035923
                                          5.0
-2.389842
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 8 42]]
Status: Improved
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
            1.4
                    -0.127706
                                          3.5
0.480027
            1.4 -0.234609
                                          3.0
1
-0.674134
                         0.044201
            1.3
                                          3.2
```

-0.341908

3	1.5	0.091290	3.1
-0.597395			
4	1.4	0.015738	3.6
0.646835			
=	=	sepal length (cm) sepa	l length (cm)
sepal length		2 264703	E 1
0 -2.264703	5.1	-2.264703	5.1
1	4.9	-2.080961	4.9
-2.080961	4.9	2.000901	4.9
2	4.7	-2.364229	4.7
-2.364229	1 • /	2.001229	1 • /
3	4.6	-2.299384	4.6
-2.299384	1.0	2.23301	1.0
4	5.0	-2.389842	5.0
-2.389842			
shape (150, 8	3)		
- <u>-</u> - (,	,		
******	*****		
Accuracy= 0.	. 92		
Confusion Mat			
[[50 0 0]			
[0 49 1]			
[0 11 39]]			
Status: Improv	zed		
=		n (cm) petal length (cm) petal width
(cm) petal v	=	_	, 1
0	1.4	-0.127706	0.2
-0.024168			
1	1.4	-0.234609	0.2
-0.103007			
2	1.3	0.044201	0.2
-0.028377			
3	1.5	0.091290	0.2
0.065956			
4	1.4	0.015738	0.2
0.035923			
sepal leng	gth (cm)	sepal length (cm) sepa	l length (cm)
sepal length	(cm) \		
0	5.1	-2.264703	5.1
-2.264703			

1	4.9	-2.080961	4.9
-2.080961	4 7	0.264000	4 7
2 -2.364229	4.7	-2.364229	4.7
-2.364229 3	4.6	-2.299384	4.6
-2.299384	4.0	2.299304	4.0
4	5.0	-2.389842	5.0
-2.389842		2.003012	
petal len	gth (cm)	petal length (cm)	
0	1.4	-0.127706	
1	1.4	-0.234609	
2	1.3	0.044201	
3	1.5	0.091290	
4	1.4	0.015738	
shape (150,	10)		
*****	*****	*	
Accuracy= 0	.913333333	33333333	
Confusion Ma	trix		
[[50 0 0]			
[0 48 2]			
[0 11 39]]			
Status: Impro	ved		
Features se	pal width	(cm) sepal width	(cm) sepal length
(cm) sepal	length (cr	m) \	
0	3.5	0.480027	5.1
-2.264703			
1	3.0	-0.674134	4.9
-2.080961			
2	3.2	-0.341908	4.7
-2.364229			
3	3.1	-0.597395	4.6
-2.299384			
4	3.6	0.646835	5.0
-2.389842	J • 0	0.010000	J. 0
2.000012			
petal len	ath (cm)	petal length (cm)	sepal length (cm)
sepal length	=	1- 3 COL	30par rongon (om)
0	1.4	-0.127706	5.1
-2.264703	±. • ±	0.12//00	J•1
1	1.4	-0.234609	4.9
Τ.	⊥ • ⊐	いって コサロリフ	→ ¬
-2.080961		0.201003	1.0

```
1.3
2
                                               4.7
                         0.044201
    -2.364229
                        0.091290
                                                4.6
3
            1.5
    -2.299384
                   0.015738
                                               5.0
4
             1.4
    -2.389842
  sepal width (cm) sepal width (cm)
0
             3.5
                     0.480027
            3.0
                     -0.674134
1
2
             3.2
                     -0.341908
3
                     -0.597395
             3.1
             3.6
                    0.646835
shape (150, 10)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
            1.4 -0.127706
                                           0.2
0
-0.024168
             1.4 -0.234609
                                           0.2
1
-0.103007
             1.3
                         0.044201
                                           0.2
-0.028377
3
             1.5
                         0.091290
                                           0.2
0.065956
             1.4
                  0.015738
                                           0.2
0.035923
 petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
\Omega
             0.2 -0.024168
                                           3.5
0.480027
             0.2 -0.103007
                                           3.0
-0.674134
             0.2 -0.028377
                                           3.2
-0.341908
```

```
3
            0.2 0.065956
                                       3.1
-0.597395
            0.2 0.035923
                                       3.6
0.646835
shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 49 1]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal width
(cm) sepal width (cm) \
                    -2.264703
                                           3.5
             5.1
0.480027
1
             4.9 -2.080961
                                           3.0
-0.674134
             4.7 -2.364229
                                           3.2
-0.341908
             4.6 -2.299384
                                           3.1
3
-0.597395
             5.0 -2.389842
                                            3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm) \
                                            1.4
             5.1
                    -2.264703
-0.127706
1
             4.9
                   -2.080961
                                            1.4
-0.234609
             4.7 -2.364229
                                            1.3
   0.044201
3
             4.6 -2.299384
                                           1.5
   0.091290
             5.0 -2.389842
4
                                           1.4
    0.015738
  petal length (cm) petal length (cm)
             1.4
                   -0.127706
0
             1.4
                     -0.234609
1
             1.3
2
                          0.044201
             1.5
3
                          0.091290
```

```
1.4
                        0.015738
shape (150, 10)
******
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.9621949409856263
Status: Accepted
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
            1.4 -0.127706
                                           0.2
0
-0.024168
            1.4 -0.234609
                                           0.2
-0.103007
             1.3
                                           0.2
                         0.044201
-0.028377
            1.5
                         0.091290
                                          0.2
3
0.065956
            1.4
                  0.015738
                                          0.2
0.035923
  sepal width (cm) sepal width (cm) sepal width (cm) sepal
width (cm) \
\cap
            3.5 0.480027
                                       3.5
0.480027
            3.0 -0.674134
                                           3.0
-0.674134
2
            3.2
                   -0.341908
                                           3.2
-0.341908
            3.1
                    -0.597395
                                           3.1
-0.597395
            3.6 0.646835
                                     3.6
4
0.646835
  petal length (cm) petal length (cm)
0
            1.4
                     -0.127706
            1.4
1
                     -0.234609
2.
            1.3
                         0.044201
            1.5
3
                         0.091290
4
            1.4
                         0.015738
```

final shape (150, 10)

Status:Improved

*****	*****		
Accuracy= 0.9	066666666	66666	
Confusion Matr	ix		
[[50 0 0]			
[0 45 5]			
[0 9 41]]			
Status:Improve	d		
		m) sepal width (cm) se	pal length
(cm) sepal le		-	Par rolly oll
0	3.5		5.1
-2.264703	.	3 . 10002 /	0.1
1	3.0	-0.674134	4.9
-2.080961	3 . 0	0.071131	1.5
2.000901	3.2	-0.341908	4.7
-2.364229	5.2	0.341900	1. /
3	3.1	-0.597395	4.6
-2.299384	J • I	-0.397393	4.0
4	3.6	0.646835	5.0
_	3.0	0.040033	5.0
-2.389842			
no+ol long+	h (am) na	tal langth (am) notal l	onath (am)
	_	tal length (cm) petal l	ength (Cm)
petal length (0 107706	1 4
0	1.4	-0.127706	1.4
-0.127706	1 4	0.024600	1 4
1	1.4	-0.234609	1.4
-0.234609	1 0	0 044001	1 2
2	1.3	0.044201	1.3
0.044201		0.001000	4 -
3	1.5	0.091290	1.5
0.091290		0.015500	
4	1.4	0.015738	1.4
0.015738			
shape (150, 8)			
*****	ale ale ale ale ale 1 - 1 - 1		
Accuracy= 0.9			
Confusion Matr	lX		
[[50 0 0]			
[0 47 3]			
[0 9 41]]	1		

```
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
             1.4
                     -0.127706
                                              3.5
0.480027
             1.4 -0.234609
                                              3.0
-0.674134
             1.3
                           0.044201
                                              3.2
2
-0.341908
3
             1.5
                           0.091290
                                              3.1
-0.597395
             1.4
                           0.015738
                                              3.6
0.646835
  sepal length (cm) sepal length (cm) petal width (cm)
petal width (cm) \
                     -2.264703
                                              0.2
             5.1
-0.024168
1
             4.9
                    -2.080961
                                              0.2
-0.103007
             4.7
                    -2.364229
                                              0.2
-0.028377
             4.6
                                              0.2
3
                    -2.299384
0.065956
             5.0 -2.389842
                                              0.2
0.035923
  sepal width (cm) sepal width (cm)
0
             3.5
                    0.480027
1
             3.0
                      -0.674134
2
             3.2
                      -0.341908
3
             3.1
                      -0.597395
             3.6
                     0.646835
shape (150, 10)
*****
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.48306553509788397
```

Status: Accepted

```
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
                -0.024168
            0.2
                                           3.5
0.480027
            0.2 -0.103007
                                           3.0
-0.674134
            0.2 -0.028377
                                           3.2
-0.341908
            0.2 0.065956
                                      3.1
-0.597395
            0.2 0.035923
                                      3.6
0.646835
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm)
                    -0.127706
                                           5.1
            1.4
-2.264703
            1.4 -0.234609
1
                                           4.9
-2.080961
2
            1.3
                         0.044201
                                               4.7
    -2.364229
            1.5
                                               4.6
3
                        0.091290
    -2.299384
                                               5.0
            1.4
                        0.015738
    -2.389842
final shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
            1.4
                    -0.127706
                                           5.1
-2.264703
            1.4 -0.234609
                                           4.9
-2.080961
                                               4.7
            1.3
                         0.044201
2
    -2.364229
3
            1.5
                   0.091290
                                               4.6
   -2.299384
```

4 1.4 -2.389842 5.0 0.015738

sepal width	(cm) sepa	al width (cm) sepal lengt	ch (cm)
sepal length (cm)		
0	3.5	0.480027	5.1
-2.264703			
1	3.0	-0.674134	4.9
-2.080961			
2	3.2	-0.341908	4.7
-2.364229			
3	3.1	-0.597395	4.6
-2.299384			
4	3.6	0.646835	5.0
-2.389842			
shape (150, 8)			

Confusion Matrix

[[50 0 0]

[0 48 2]

[0 11 39]]

Status: Improved

Features s	epal width (cm) sepal width ((cm) sepal length
(cm) sepal	length (cm)	\	
0	3.5	0.480027	5.1
-2.264703			
1	3.0	-0.674134	4.9
-2.080961			
2	3.2	-0.341908	4.7
-2.364229			
3	3.1	-0.597395	4.6
-2.299384			
4	3.6	0.646835	5.0
-2.389842			

petal width	n (cm)	petal width (cm)	sepal length (cm)
sepal length	(cm)		
0	0.2	-0.024168	5.1
-2.264703			
1	0.2	-0.103007	4.9
-2.080961			

2 -2.364229	0.2	-0.028377	4.7
3 -2.299384	0.2	0.065956	4.6
4 -2.389842 shape (150, 8)	0.2	0.035923	5.0
*****	****		
Accuracy= 0.9 Confusion Matr [[50 0 0] [0 47 3] [0 11 39]] Status:Improve	ix d		al langth
(cm) petal le		m) petal width (cm) peta	al length
0 -0.127706		-0.024168	1.4
1 -0.234609	0.2	-0.103007	1.4
2 0.044201	0.2	-0.028377	1.3
3 0.091290	0.2	0.065956	1.5
0.015738	0.2	0.035923	1.4
sepal lengt:	_	pal length (cm) petal wid	dth (cm)
0 -0.024168	5.1	-2.264703	0.2
1 -0.103007	4.9	-2.080961	0.2
2 -0.028377	4.7	-2.364229	0.2
3 0.065956	4.6	-2.299384	0.2
4 0.035923 shape (150, 8)	5.0	-2.389842	0.2

```
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 8 42]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
0
             1.4 -0.127706
                                              5.1
-2.264703
             1.4 -0.234609
                                              4.9
-2.080961
             1.3
                                                  4.7
2
                           0.044201
    -2.364229
3
             1.5
                          0.091290
                                                  4.6
    -2.299384
                                                  5.0
4
             1.4
                          0.015738
    -2.389842
  sepal length (cm) sepal length (cm) sepal width (cm)
sepal width (cm)
             5.1
                  -2.264703
                                              3.5
0.480027
1
             4.9 -2.080961
                                              3.0
-0.674134
2
             4.7 -2.364229
                                              3.2
-0.341908
             4.6 -2.299384
3
                                              3.1
-0.597395
             5.0 -2.389842
                                              3.6
0.646835
shape (150, 8)
******
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.15028471557145595
Status: Accepted
Features petal length (cm) petal length (cm) petal width
```

(cm) petal width (cm) \

0	1.4	-0.	127706			0.2	
-0.024168 1	1.4	-0.	234609			0.2	
-0.103007 2	1.3		0.044	201		0.2	
-0.028377 3	1.5		0.091	.290		0.2	
0.065956 4 0.035923	1.4		0.015	738		0.2	
sepal length	=	pal	length	(cm)	petal	width	(cm)
petal width (cr		•	064500			0 0	
0 -0.024168	5.1	-2.	264/03			0.2	
1	4.9	-2	080961			0.2	
-0.103007	1.0	٠.	000301			0.2	
2	4.7	-2.	364229			0.2	
-0.028377							
3	4.6	-2.	299384			0.2	
0.065956							
4	5.0	-2.	389842			0.2	
0.035923							
final shape (15	50, 8)						

Accuracy= 0.92							
Confusion Matr	LX						
[[50 0 0]							
[0 46 4] [0 8 42]]							
	٦						
Status: Improved Features sepai		am)	conal	longth	(am)	notal	1.71 d+h
(cm) petal wid			sepai	Tengti	i (Cili)	petar	WIGCII
0	5.1		264703			0.2	
-0.024168	J • 1	۷.	204705			0.2	
1	4.9	- 2.	080961			0.2	
-0.103007	1.9	٠ •	000301			0.2	
2	4.7	-2.	364229			0.2	
-0.028377	- • /	_ •	001223			0.2	
3	4.6	-2.	299384			0.2	
0.065956		_ •				,	
4	5.0	-2.	389842			0.2	
0.035923							

petal length	_	oal width (cm) petal lend	gth (cm)		
0	3.5	0.480027	1.4		
-0.127706 1	3.0	-0.674134	1.4		
-0.234609					
2 0.044201	3.2	-0.341908	1.3		
3	3.1	-0.597395	1.5		
0.091290	3.6	0.646835	1.4		
0.015738 shape (150, 8)					
*****	*****				
Accuracy= 0.9		333333			
Confusion Matr	îix				
[0 47 3]					
[0 10 40]]	1				
Status: Improved Features sepal length (cm) sepal length (cm) sepal width					
		Citi, SCPUL LCIIGCII (Citi)	Separ Wideli		
(cm) sepal wi	-		sepai widen		
=	dth (cm)		3.5		
(cm) sepal wi 0 0.480027	dth (cm)	\	_		
(cm) sepal wi 0 0.480027 1 -0.674134	1.dth (cm) 5.1 4.9	-2.264703 -2.080961	3.5		
(cm) sepal wi 0 0.480027	dth (cm) 5.1	-2.264703	3.5		
(cm) sepal wi 0 0.480027 1 -0.674134 2 -0.341908 3	1.dth (cm) 5.1 4.9	-2.264703 -2.080961	3.5		
(cm) sepal wi 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395	1.dth (cm) 5.1 4.9 4.7	-2.264703 -2.080961 -2.364229 -2.299384	3.5 3.0 3.2 3.1		
(cm) sepal wi 0 0.480027 1 -0.674134 2 -0.341908 3	1.dth (cm) 5.1 4.9 4.7	-2.264703 -2.080961 -2.364229	3.5 3.0 3.2		
(cm) sepal width 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal width	1.dth (cm) 5.1 4.9 4.7 4.6 5.0 1 (cm) sep	-2.264703 -2.080961 -2.364229 -2.299384	3.5 3.0 3.2 3.1 3.6		
(cm) sepal wi 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal width sepal length	1.dth (cm) 5.1 4.9 4.7 4.6 5.0 1 (cm) sep	-2.264703 -2.080961 -2.364229 -2.299384 -2.389842 Pal width (cm) sepal length	3.5 3.0 3.2 3.1 3.6 gth (cm)		
(cm) sepal width 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal width	1.dth (cm) 5.1 4.9 4.7 4.6 5.0 1 (cm) sep	-2.264703 -2.080961 -2.364229 -2.299384 -2.389842	3.5 3.0 3.2 3.1 3.6		
(cm) sepal wi 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal width sepal length 0 -2.264703 1	1.dth (cm) 5.1 4.9 4.7 4.6 5.0 1 (cm) sep	-2.264703 -2.080961 -2.364229 -2.299384 -2.389842 Pal width (cm) sepal length	3.5 3.0 3.2 3.1 3.6 gth (cm)		
(cm) sepal wi 0 0.480027 1 -0.674134 2 -0.341908 3 -0.597395 4 0.646835 sepal width sepal length o 0 -2.264703	1.dth (cm) 5.1 4.9 4.7 4.6 5.0 1 (cm) sep (cm) 3.5	-2.264703 -2.080961 -2.364229 -2.299384 -2.389842 Pal width (cm) sepal lend 0.480027	3.5 3.0 3.2 3.1 3.6 gth (cm) 5.1		

```
3
            3.1 -0.597395
                                            4.6
-2.299384
             3.6 0.646835
                                            5.0
-2.389842
shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 8 42]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2 -0.024168
                                            3.5
0.480027
1
             0.2 -0.103007
                                            3.0
-0.674134
             0.2 -0.028377
                                            3.2
-0.341908
             0.2 0.065956
3
                                       3.1
-0.597395
             0.2 0.035923
                                       3.6
0.646835
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm) \
                                            5.1
             5.1
                    -2.264703
-2.264703
1
             4.9
                    -2.080961
                                            4.9
-2.080961
             4.7 -2.364229
                                            4.7
-2.364229
             4.6 -2.299384
                                            4.6
3
-2.299384
             5.0 -2.389842
                                            5.0
-2.389842
  petal length (cm) petal length (cm)
             1.4
                    -0.127706
0
             1.4
                     -0.234609
1
             1.3
2
                          0.044201
             1.5
3
                          0.091290
```

```
0.015738
           1.4
shape (150, 10)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
               -0.127706
                                        5.1
0
           1.4
-2.264703
            1.4 -0.234609
                                        4.9
-2.080961
                      0.044201
           1.3
                                           4.7
    -2.364229
            1.5
                                            4.6
                       0.091290
    -2.299384
                      0.015738
                                           5.0
4
           1.4
    -2.389842
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
            0.2 -0.024168
                                        3.5
0.480027
            0.2 -0.103007
                                        3.0
-0.674134
           0.2 -0.028377
                                        3.2
-0.341908
3
            0.2 0.065956
                                   3.1
-0.597395
           0.2 0.035923
                                    3.6
0.646835
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 9 41]]
Status: Improved
```

Features peta (cm) sepal wi	-	cm) petal length (c	m) sepal width	
0 0.480027		-0.127706	3.5	
1 -0.674134	1.4	-0.234609	3.0	
2 -0.341908	1.3	0.044201	3.2	
3 -0.597395	1.5	0.091290	3.1	
4 0.646835	1.4	0.015738	3.6	
sepal width width (cm)	(cm) sep	al width (cm) petal	width (cm) petal	
0 -0.024168	3.5	0.480027	0.2	
1 -0.103007	3.0	-0.674134	0.2	
2 -0.028377	3.2	-0.341908	0.2	
3 0.065956	3.1	-0.597395	0.2	
4 0.035923 shape (150, 8)	3.6	0.646835	0.2	

Accuracy= 0.9 Confusion Matr				
[[50 0 0] [0 46 4] [0 8 42]]				
Status: Improve				
(cm) sepal with	-	cm) sepal length (c \	m) sepal width	
0 0.480027	5.1	-2.264703	3.5	
1 -0.674134	4.9	-2.080961	3.0	
2 -0.341908	4.7	-2.364229	3.2	
3 -0.597395	4.6	-2.299384	3.1	

```
5.0 -2.389842
                                           3.6
0.646835
  petal length (cm) petal length (cm) petal length (cm)
petal length (cm) \
             1.4
                    -0.127706
                                            1.4
-0.127706
             1.4 -0.234609
                                            1.4
1
-0.234609
             1.3
                          0.044201
                                                1.3
   0.044201
3
             1.5
                          0.091290
                                                1.5
   0.091290
4
             1.4
                         0.015738
                                                1.4
   0.015738
  sepal width (cm) sepal width (cm)
0
             3.5 0.480027
             3.0
                     -0.674134
1
2
             3.2
                     -0.341908
3
             3.1
                     -0.597395
             3.6
                    0.646835
shape (150, 10)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
                    -0.127706
             1.4
                                            3.5
0.480027
             1.4 -0.234609
                                            3.0
-0.674134
2
             1.3
                                            3.2
                          0.044201
-0.341908
             1.5
                          0.091290
                                            3.1
-0.597395
             1.4
                                            3.6
                         0.015738
0.646835
```

petal width	(cm) pet	al width (cm) sepal	width (cm)	sepal	
0 0.480027	0.2	-0.024168	3.5		
1 -0.674134	0.2	-0.103007	3.0		
2 -0.341908	0.2	-0.028377	3.2		
3	0.2	0.065956	3.1		
-0.597395 4 0.646835 shape (150, 8)	0.2	0.035923	3.6		
*************** Accuracy= 0.92 Confusion Matrix					
[[50 0 0] [0 47 3] [0 9 41]]	,				
Status:Improved Features petal length (cm) petal length (cm) sepal length					
(cm) sepal le	_	-0.127706	5.1		
-2.264703 1 -2.080961	1.4	-0.234609	4.9		
-2.000961 2 -2.364229	1.3	0.044201	4.	7	
-2.304223 3 -2.299384	1.5	0.091290	4.	6	
4 -2.389842	1.4	0.015738	5.	0	
		al width (cm) sepal	width (cm)	sepal	
0 0.480027	0.2	-0.024168	3.5		
1 -0.674134	0.2	-0.103007	3.0		
2 -0.341908	0.2	-0.028377	3.2		
3 -0.597395	0.2	0.065956	3.1		

```
0.2 0.035923
                                    3.6
0.646835
shape (150, 8)
*****
Confusion Matrix
[[50 0 01]
[ 0 46 4]
[ 0 9 41]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
            5.1 -2.264703
                                         0.2
-0.024168
            4.9
                   -2.080961
                                         0.2
-0.103007
2
            4.7 -2.364229
                                         0.2
-0.028377
3
            4.6 -2.299384
                                         0.2
0.065956
            5.0 -2.389842
                                         0.2
0.035923
  petal length (cm) petal length (cm) petal width (cm)
petal width (cm)
            1.4 -0.127706
                                         0.2
-0.024168
            1.4 -0.234609
                                         0.2
-0.103007
2
            1.3
                        0.044201
                                         0.2
-0.028377
            1.5
                                         0.2
                        0.091290
0.065956
            1.4
                  0.015738
                                         0.2
0.035923
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 47 3]
```

[0 9 41]]

```
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
                 -0.024168
            0.2
                                          3.5
0.480027
            0.2
                                          3.0
                    -0.103007
-0.674134
            0.2
                   -0.028377
                                          3.2
2
-0.341908
            0.2 0.065956
                                      3.1
-0.597395
            0.2 0.035923
                                      3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
            5.1 -2.264703
                                          1.4
-0.127706
            4.9
                   -2.080961
                                          1.4
-0.234609
            4.7
                   -2.364229
                                          1.3
2
    0.044201
            4.6 -2.299384
                                          1.5
3
    0.091290
            5.0 -2.389842
                                          1.4
4
    0.015738
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
0
            5.1 -2.264703
                                          0.2
-0.024168
                                          0.2
            4.9 -2.080961
-0.103007
            4.7 -2.364229
                                          0.2
-0.028377
```

```
0.2
3
            4.6 -2.299384
0.065956
            5.0 -2.389842
                                           0.2
0.035923
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm) \
0
            1.4
                -0.127706
                                           5.1
-2.264703
            1.4 -0.234609
                                           4.9
-2.080961
            1.3
                                               4.7
2
                         0.044201
    -2.364229
3
            1.5
                         0.091290
                                               4.6
    -2.299384
                        0.015738
                                               5.0
4
            1.4
    -2.389842
  petal length (cm) petal length (cm)
0
            1.4
                     -0.127706
1
            1.4
                    -0.234609
            1.3
2
                         0.044201
3
            1.5
                         0.091290
             1.4
                         0.015738
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2 -0.024168
                                           3.5
0
0.480027
            0.2 -0.103007
                                           3.0
-0.674134
            0.2 -0.028377
                                          3.2
-0.341908
            0.2 0.065956
                                     3.1
3
-0.597395
```

```
0.646835
  petal width (cm) petal width (cm) sepal length (cm)
sepal length (cm)
                     -0.024168
                                            5.1
             0.2
-2.264703
             0.2
                   -0.103007
                                            4.9
-2.080961
             0.2
                   -0.028377
                                            4.7
-2.364229
             0.2 0.065956
                                            4.6
3
-2.299384
             0.2 0.035923
                                            5.0
-2.389842
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 46 4]
[ 0 8 42]]
Status: Improved
Features petal width (cm) petal width (cm) petal length
(cm) petal length (cm) \
             0.2
                    -0.024168
                                            1.4
-0.127706
             0.2
                    -0.103007
                                            1.4
-0.234609
             0.2
                    -0.028377
                                            1.3
    0.044201
             0.2 0.065956
                                            1.5
3
    0.091290
             0.2 0.035923
                                            1.4
4
   0.015738
  sepal width (cm) sepal width (cm) sepal width (cm) sepal
width (cm)
             3.5 0.480027
                                        3.5
0.480027
             3.0 -0.674134
                                            3.0
-0.674134
```

0.2 0.035923

3.6

2 -0.341908	3.2	-0.341908	3.2		
3 -0.597395	3.1	-0.597395	3.1		
4 0.646835 shape (150, 8)	3.6	0.646835	3.6		
****	*****				
Accuracy= 0.9066666666666666666666666666666666666					
-		m) petal width (cm)	sepal width (cm)		
sepal width (cr	m) \				
0	0.2	-0.024168	3.5		
0.480027					
1	0.2	-0.103007	3.0		
-0.674134					
2	0.2	-0.028377	3.2		
-0.341908					
3	0.2	0.065956	3.1		
-0.597395					
4	0.2	0.035923	3.6		
0.646835					
sepal lengtl		pal length (cm) peta	al width (cm)		
0 -0.024168	5.1	-2.264703	0.2		
1 -0.103007	4.9	-2.080961	0.2		
2 -0.028377	4.7	-2.364229	0.2		
3 0.065956	4.6	-2.299384	0.2		
4 0.035923 shape (150, 8)	5.0	-2.389842	0.2		
*****	****				

Accuracy= 0.92

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal width
(cm) sepal width (cm) \
0
             5.1 -2.264703
                                            3.5
0.480027
             4.9 -2.080961
                                            3.0
-0.674134
             4.7 -2.364229
2
                                            3.2
-0.341908
3
             4.6 -2.299384
                                            3.1
-0.597395
             5.0 -2.389842
                                            3.6
0.646835
  sepal length (cm) sepal length (cm) sepal width (cm)
sepal width (cm)
             5.1 -2.264703
                                            3.5
0.480027
             4.9 -2.080961
                                            3.0
1
-0.674134
2
             4.7 -2.364229
                                            3.2
-0.341908
             4.6 -2.299384
3
                                            3.1
-0.597395
             5.0 -2.389842
                                            3.6
0.646835
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2 -0.024168
                                            3.5
0.480027
```

1	0.2	-0.103007		3.0	
-0.674134 2 -0.341908	0.2	-0.028377		3.2	
3 -0.597395	0.2	0.065956	3.	1	
4 0.646835	0.2	0.035923	3.	6	
sepal length (control of the control	cm)	pal length (cm) -2.264703	petal :	length	(cm)
1 -0.234609	4.9	-2.080961		1.4	
2 0.044201	4.7	-2.364229		1.3	
3	4.6	-2.299384		1.5	
0.091290 4 0.015738 shape (150, 8)	5.0	-2.389842		1.4	
************ Accuracy= 0.92 Confusion Matri [[50 0 0] [0 46 4] [0 8 42]] Status:Improved	2 i.x				
=	l length (d	cm) petal length	n (cm)	petal	width
0		-0.127706		0.2	
-0.024168 1 -0.103007	1.4	-0.234609		0.2	
2	1.3	0.044201		0.2	
-0.028377 3	1.5	0.091290		0.2	
0.065956 4 0.035923	1.4	0.015738		0.2	

width (cm) 0
0.480027 1 3.0 -0.674134 3.0 -0.674134 3.2 3.2 -0.341908 3.2 3.2 -0.597395 3.1 -0.597395 3.1 4 3.6 0.646835 3.6 0.646835 3.6 0.646835 3.6
1 3.0 -0.674134 3.0 -0.674134 3.2 3.2 2 3.2 -0.341908 3.2 -0.341908 3.1 -0.597395 3.1 -0.597395 3.6 0.646835 3.6 0.646835 3.6 0.646835 3.6
-0.674134 2
2 3.2 -0.341908 3.2 -0.341908 3 3.1 -0.597395 3.1 -0.597395 4 3.6 0.646835 3.6 0.646835
-0.341908 3
3 3.1 -0.597395 3.1 -0.597395 4 3.6 0.646835 3.6 0.646835
4 3.6 0.646835 3.6 0.646835
0.646835
shape (150, 8)

Accuracy= 0.92666666666666666666666666666666666666
Confusion Matrix
[[50 0 0]
[0 48 2]
[0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
0 0.2 -0.024168 3.5
0.480027
1 0.2 -0.103007 3.0
-0.674134 2 0.2 -0.028377 3.2
-0.341908 3 0.2 0.065956 3.1
-0.597395
4 0.2 0.035923 3.6
0.646835
0.010033
sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm)
0 5.1 -2.264703 5.1
-2.264703
1 4.9 -2.080961 4.9
-2.080961
2 4.7 -2.364229 4.7
-2.364229
3 4.6 -2.299384 4.6
-2.299384

```
5.0 -2.389842
                                         5.0
-2.389842
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) petal width
(cm) petal width (cm) \
            1.4 -0.127706
                                         0.2
-0.024168
            1.4 -0.234609
                                         0.2
-0.103007
2
            1.3
                       0.044201
                                        0.2
-0.028377
3
            1.5
                        0.091290
                                         0.2
0.065956
            1.4
                       0.015738
                                         0.2
0.035923
  petal length (cm) petal length (cm) sepal length (cm)
sepal length (cm)
            1.4 -0.127706
                                         5.1
-2.264703
            1.4 -0.234609
                                         4.9
-2.080961
            1.3
                       0.044201
                                             4.7
    -2.364229
            1.5
3
                       0.091290
                                             4.6
   -2.299384
            1.4
                   0.015738
                                             5.0
4
    -2.389842
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
```

```
Status: Improved
Features petal length (cm) petal length (cm) petal length
(cm) petal length (cm) \
0
             1.4
                      -0.127706
                                              1.4
-0.127706
             1.4 -0.234609
                                              1.4
-0.234609
             1.3
                           0.044201
                                                   1.3
2
    0.044201
             1.5
3
                           0.091290
                                                   1.5
    0.091290
             1.4
4
                          0.015738
                                                   1.4
    0.015738
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm) \
             0.2 - 0.024168
                                              3.5
0.480027
              0.2
                                              3.0
                      -0.103007
-0.674134
             0.2
                      -0.028377
                                              3.2
2
-0.341908
                    0.065956
                                         3.1
             0.2
-0.597395
4
             0.2 0.035923
                                         3.6
0.646835
  sepal length (cm) sepal length (cm)
0
             5.1
                      -2.264703
             4.9
1
                       -2.080961
2
             4.7
                       -2.364229
             4.6
3
                       -2.299384
              5.0
                       -2.389842
shape (150, 10)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features petal length (cm) petal length (cm) sepal length
```

(cm) sepal length (cm) \

0	1.4	-0.127706	5.1
-2.264703 1	1.4	-0.234609	4.9
-2.080961 2	1.3	0.044201	4.7
-2.364229			
3 -2.299384	1.5	0.091290	4.6
4	1.4	0.015738	5.0
-2.389842	2		
petal width width width	n (cm) pet	tal width (cm) petal	width (cm) petal
0	0.2	-0.024168	0.2
-0.024168			
1 -0.103007	0.2	-0.103007	0.2
2	0.2	-0.028377	0.2
-0.028377		0.065056	
3 0.065956	0.2	0.065956	0.2
4	0.2	0.035923	0.2
0.035923 shape (150, 8)			
*****	****		
Accuracy= 0.9		566666	
Confusion Matr	Cix		
[[50 0 0] [0 48 2]			
[0 9 41]]			
Status: Improve	ed		
		cm) petal width (cm)	sepal length
(cm) sepal le	-		- 4
0 -2.264703	0.2	-0.024168	5.1
-2.264703 1	0.2	-0.103007	4.9
-2.080961			
2	0.2	-0.028377	4.7
-2.364229 3	0.2	0.065956	4.6
-2.299384	0.2	0.00000	 ∪
4	0.2	0.035923	5.0
-2.389842			

```
petal length (cm) petal length (cm) sepal width (cm)
sepal width (cm)
             1.4
                  -0.127706
                                             3.5
0.480027
             1.4 -0.234609
                                             3.0
-0.674134
             1.3
                          0.044201
                                            3.2
2
-0.341908
             1.5
                          0.091290
                                            3.1
-0.597395
             1.4
                          0.015738
                                            3.6
0.646835
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
0
             3.5
                 0.480027
                                             5.1
-2.264703
             3.0 -0.674134
                                             4.9
1
-2.080961
                                            4.7
             3.2
                     -0.341908
-2.364229
3
             3.1
                    -0.597395
                                             4.6
-2.299384
             3.6 0.646835
                                             5.0
-2.389842
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm) \
             0.2 -0.024168
                                             0.2
-0.024168
             0.2 -0.103007
                                             0.2
-0.103007
             0.2 -0.028377
                                             0.2
-0.028377
```

```
0.2
3
            0.2 0.065956
0.065956
            0.2
                  0.035923
                                      0.2
0.035923
  sepal width (cm) sepal width (cm)
0
            3.5
                     0.480027
1
            3.0
                     -0.674134
2
            3.2
                     -0.341908
3
            3.1
                     -0.597395
             3.6
                    0.646835
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2 -0.024168
                                           3.5
0
0.480027
1
            0.2 -0.103007
                                           3.0
-0.674134
                   -0.028377
            0.2
                                           3.2
-0.341908
            0.2
                    0.065956
                                      3.1
-0.597395
            0.2
                   0.035923
                                      3.6
0.646835
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
                  -2.264703
                                           1.4
            5.1
-0.127706
            4.9
                  -2.080961
                                           1.4
-0.234609
            4.7
                  -2.364229
2
                                           1.3
    0.044201
            4.6
                  -2.299384
                                           1.5
3
    0.091290
```

```
5.0 -2.389842
                                            1.4
4
    0.015738
shape (150, 8)
*****
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 9 41]]
Status: Improved
Features sepal width (cm) sepal width (cm) petal length
(cm) petal length (cm) \
             3.5
                    0.480027
                                            1.4
-0.127706
             3.0 -0.674134
                                            1.4
1
-0.234609
2
             3.2
                   -0.341908
                                            1.3
    0.044201
3
             3.1 -0.597395
                                            1.5
   0.091290
             3.6 0.646835
4
                                            1.4
   0.015738
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm) \
             5.1 -2.264703
                                            1.4
-0.127706
             4.9
                    -2.080961
                                            1.4
-0.234609
2
             4.7
                    -2.364229
                                            1.3
    0.044201
3
                                            1.5
             4.6
                   -2.299384
    0.091290
4
             5.0 -2.389842
                                            1.4
   0.015738
  sepal width (cm) sepal width (cm)
0
             3.5
                      0.480027
1
             3.0
                      -0.674134
2
             3.2
                      -0.341908
3
             3.1
                      -0.597395
             3.6
                    0.646835
shape (150, 10)
```

```
Confusion Matrix
[[50 0 0]]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal length
(cm) sepal length (cm) \
0
            3.5
                    0.480027
                                           5.1
-2.264703
             3.0 -0.674134
                                           4.9
1
-2.080961
             3.2 -0.341908
                                           4.7
-2.364229
             3.1 -0.597395
                                           4.6
-2.299384
             3.6 0.646835
                                           5.0
-2.389842
  petal width (cm) petal width (cm) petal width (cm) petal
width (cm) \
             0.2 -0.024168
                                           0.2
-0.024168
             0.2
                   -0.103007
                                           0.2
-0.103007
             0.2 -0.028377
                                           0.2
2
-0.028377
             0.2 0.065956 0.2
0.065956
             0.2 0.035923
                                      0.2
0.035923
  sepal width (cm) sepal width (cm)
             3.5
                    0.480027
0
1
             3.0
                     -0.674134
2
             3.2
                     -0.341908
3
             3.1
                     -0.597395
                    0.646835
             3.6
shape (150, 10)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
0
            0.2
                -0.024168
                                           5.1
-2.264703
            0.2 -0.103007
                                           4.9
-2.080961
            0.2 -0.028377
                                          4.7
2
-2.364229
            0.2 0.065956
                                          4.6
-2.299384
            0.2 0.035923
                                           5.0
-2.389842
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
                 -2.264703
                                           1.4
            5.1
-0.127706
            4.9 -2.080961
1
                                           1.4
-0.234609
2
            4.7 -2.364229
                                          1.3
    0.044201
            4.6 -2.299384
                                          1.5
3
    0.091290
            5.0 -2.389842
                                          1.4
    0.015738
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal length (cm) sepal length (cm) petal width
(cm) petal width (cm) \
            5.1 -2.264703
                                           0.2
```

-0.024168

```
0.2
            4.9 -2.080961
1
-0.103007
            4.7
                  -2.364229
                                          0.2
-0.028377
                                          0.2
3
            4.6 -2.299384
0.065956
            5.0 -2.389842
                                          0.2
0.035923
  petal length (cm) petal length (cm) petal width (cm)
petal width (cm) \
            1.4 -0.127706
                                          0.2
-0.024168
            1.4 -0.234609
                                          0.2
-0.103007
            1.3
                         0.044201
                                          0.2
2
-0.028377
3
            1.5
                         0.091290
                                          0.2
0.065956
            1.4
                         0.015738
                                          0.2
0.035923
  petal length (cm) petal length (cm)
            1.4
                    -0.127706
0
1
            1.4
                    -0.234609
2
            1.3
                        0.044201
3
            1.5
                         0.091290
            1.4
                         0.015738
shape (150, 10)
*****
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 10 40]]
Status: Improved
Features sepal width (cm) sepal width (cm) petal width (cm)
petal width (cm) \
            3.5 0.480027
                                      0.2
-0.024168
                                          0.2
            3.0 -0.674134
-0.103007
```

```
0.2
2
            3.2 -0.341908
-0.028377
             3.1
                    -0.597395
                                           0.2
0.065956
             3.6 0.646835
                                       0.2
0.035923
  petal width (cm) petal width (cm) petal length (cm)
petal length (cm) \
             0.2
                 -0.024168
                                           1.4
-0.127706
             0.2
                   -0.103007
1
                                           1.4
-0.234609
             0.2
                    -0.028377
                                           1.3
    0.044201
             0.2
                    0.065956
                                           1.5
3
    0.091290
4
            0.2 0.035923
                                           1.4
    0.015738
  sepal length (cm) sepal length (cm)
             5.1
                     -2.264703
0
1
             4.9
                     -2.080961
2
             4.7
                     -2.364229
3
             4.6
                     -2.299384
             5.0
                     -2.389842
shape (150, 10)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal length (cm) sepal length (cm) sepal length
(cm) sepal length (cm) \
0
             5.1
                -2.264703
                                           5.1
-2.264703
             4.9 -2.080961
                                           4.9
-2.080961
             4.7 -2.364229
                                           4.7
-2.364229
```

3	4.6	-2.299384	4.6
-2.299384 4	F O	-2.389842	5.0
-2.389842	5.0	-2.309042	3.0
sepal width width (cm)	h (cm)	sepal width (cm)	petal width (cm)
0 -0.024168	3.5	0.480027	0.2
1 -0.103007	3.0	-0.674134	0.2
2 -0.028377	3.2	-0.341908	0.2
3 0.065956	3.1		0.2
4 0.035923 shape (150, 8	3.6	0.646835	0.2
********** Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3]	90666666		
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve	90666666 rix ed		(cm) petal lengt
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve	90666666 rix ed al width ength (c	66666666666666666666666666666666666666	-
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve Features sep	90666666 rix ed al width ength (c 3.5	(cm) sepal width cm) \ 0.480027	(cm) petal lengt
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve Features sepe (cm) petal 10 0 -0.127706 1 -0.234609	90666666 rix ed al width ength (c 3.5	(cm) sepal width cm) \ 0.480027 -0.674134	1.4
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve Features sepe (cm) petal 10 0 -0.127706 1 -0.234609 2 0.044201	90666666 rix ed al width ength (c 3.5 3.0	(cm) sepal width cm) \ 0.480027 -0.674134 -0.341908	1.4 1.4 1.3
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve Features sep (cm) petal 10 0 -0.127706 1 -0.234609 2	90666666 rix ed al width ength (c 3.5 3.0 3.2 3.1	(cm) sepal width cm) \ 0.480027 -0.674134 -0.341908 -0.597395	1.4 1.4 1.3
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve Features sepe (cm) petal 10 0 -0.127706 1 -0.234609 2 0.044201 3	90666666 rix ed al width ength (c 3.5 3.0	(cm) sepal width cm) \ 0.480027 -0.674134 -0.341908	1.4 1.4 1.3
Accuracy= 0. Confusion Mat [[50 0 0] [0 47 3] [0 11 39]] Status:Improve Features sepe (cm) petal 10 0 -0.127706 1 -0.234609 2 0.044201 3 0.091290 4 0.015738	90666666 rix ed al width ength (c 3.5 3.0 3.2 3.1 3.6	(cm) sepal width cm) \ 0.480027 -0.674134 -0.341908 -0.597395	1.4 1.4 1.3 1.5

1	4.9	-2.080961	1.4
-0.234609 2	4.7	-2.364229	1.3
0.044201	4./	-2.304229	1.5
3	4.6	-2.299384	1.5
0.091290			
4	5.0	-2.389842	1.4
0.015738			
shape (150, 8)			
*****	****		
Accuracy= 0.9	066666666	66666	
Confusion Matr			
[[50 0 0]			
[0 45 5]			
[0 9 41]]			
Status: Improve			
-	-	cm) petal length (cm) p	etal width
(cm) petal wi			0 0
0 024169	1.4	-0.127706	0.2
-0.024168 1	1 Δ	-0.234609	0.2
-0.103007	T • 4	0.234009	0.2
2	1.3	0.044201	0.2
-0.028377			
3	1.5	0.091290	0.2
0.065956			
4	1.4	0.015738	0.2
0.035923			
	la (am) aa		al + la
sepal lengt petal width (c		pal length (cm) petal wi	ath (cm)
petar wrath (c	5.1	-2.264703	0.2
-0.024168	J • 1	2.201703	0.2
1	4.9	-2.080961	0.2
-0.103007			
2	4.7	-2.364229	0.2
-0.028377			
3	4.6	-2.299384	0.2
0.065956			
4	5.0	-2.389842	0.2
0.035923			
shape (150, 8)			

```
Accuracy= 0.9
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 10 40]]
Pr[accept] = 1.0
Random uniform: 0.6841915595333996
Status: Accepted
Features petal length (cm) petal length (cm) sepal width
(cm) sepal width (cm) \
                    -0.127706
             1.4
                                            3.5
0.480027
             1.4 -0.234609
                                            3.0
-0.674134
             1.3
                          0.044201
                                            3.2
2
-0.341908
             1.5
                          0.091290
                                            3.1
3
-0.597395
             1.4
                          0.015738
                                            3.6
0.646835
  petal width (cm) petal width (cm) sepal width (cm) sepal
width (cm)
             0.2 -0.024168
                                            3.5
0
0.480027
             0.2
                    -0.103007
                                            3.0
-0.674134
             0.2
                                            3.2
                     -0.028377
-0.341908
3
             0.2
                    0.065956
                                       3.1
-0.597395
             0.2 0.035923
                                       3.6
0.646835
final shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 47 3]
[ 0 11 39]]
```

Status: Improved

Features sepa	=	=	ngth (cm) pet	al width
0		-2.264703	0	.2
-0.024168				
1	4.9	-2.080961	0	.2
-0.103007 2	4.7	-2.364229	0	.2
-0.028377	1. /	2.504225	O	• 2
3	4.6	-2.299384	0	.2
0.065956				
4	5.0	-2.389842	0	.2
0.035923				
sepal width	n (cm) sej	pal width (cm)	petal width	(cm) petal
width (cm)				
0 -0.024168	3.5	0.480027	0.2	
1	3.0	-0.674134	0	.2
-0.103007				
2	3.2	-0.341908	0	.2
-0.028377 3	3.1	-0.597395	0	.2
0.065956	J.1	0.397393	O	• 4
4	3.6	0.646835	0.2	
0.035923				
shape (150, 8)				
*****	. + + + + + + +			
Accuracy= 0.9				
Confusion Mata				
[[50 0 0]				
[0 49 1]				
[0 11 39]]				
Status: Improve				
=	=	=	ngth (cm) sep	al length
(cm) sepal $1e$	=	-0.127706	5	5.1
-2.264703	1.4	-0.127700	J	7 • ⊥
1	1.4	-0.234609	4	. 9
-2.080961				
2	1.3	0.04420	1	4.7
-2.364229				
3	1.5	0.09129	0	4.6
-2.299384	ł			

```
4 1.4 0.015738 5.0 -2.389842
```

sepal width (c	m) sepal width (cm)	petal width	(cm) petal
width (cm) \			
0 3.	5 0.480027	0.2	
-0.024168			
1 3.	0 -0.674134	0	.2
-0.103007			
2 3.	2 -0.341908	0	. 2
-0.028377			
3 3.	1 -0.597395	0	. 2
0.065956			
4 3.	6 0.646835	0.2	
0.035923	0.01000	V • =	
0.000720			
sepal length (cm) sepal length (c:	m)	

	sepal le	ngth (cm)	sepal length	(cm)
0		5.1	-2.264703	
1		4.9	-2.080961	
2		4.7	-2.364229	
3		4.6	-2.299384	
4		5.0	-2.389842	
sh	ape (150,	10)		

Confusion Matrix

[[50 0 0] [0 46 4] [0 9 41]]

Status: Improved

Features	sepal length	(cm) sepal	length (cm)	sepal width
(cm) sepa	al width (cm)	\		
0	5.1	-2.264703		3.5
0.480027				
1	4.9	-2.080961		3.0
-0.674134				
2	4.7	-2.364229		3.2
-0.341908				
3	4.6	-2.299384		3.1
-0.597395				
4	5.0	-2.389842		3.6
0.646835				

sepal width width (cm)	(cm) sep	al width (cm) petal	width (cm) petal
0 -0.024168	3.5	0.480027	0.2
1 -0.103007	3.0	-0.674134	0.2
2	3.2	-0.341908	0.2
-0.028377 3	3.1	-0.597395	0.2
0.065956 4 0.035923	3.6	0.646835	0.2
shape (150, 8)			
********** Accuracy= 0.9 Confusion Matr [[50 0 0] [0 48 2] [0 11 39]] Status:Improve	1333333333 ix	33333	
Features sepa	l length (cm) sepal length (c	m) sepal width
(cm) sepal wi		-2.264703	3.5
0.480027			
1 -0.674134	4.9	-2.080961	3.0
2 -0.341908	4.7	-2.364229	3.2
3 -0.597395	4.6	-2.299384	3.1
4 0.646835	5.0	-2.389842	3.6
sepal width	-	al width (cm) petal	length (cm)
0 -0.127706	3.5	0.480027	1.4
1 -0.234609	3.0	-0.674134	1.4
2 0.044201	3.2	-0.341908	1.3
3 0.091290	3.1	-0.597395	1.5

```
3.6 0.646835
                                         1.4
4
    0.015738
shape (150, 8)
*****
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 11 39]]
Status: Improved
Features sepal width (cm) sepal width (cm) sepal width (cm)
sepal width (cm) \
            3.5
                0.480027
                                     3.5
0.480027
            3.0 -0.674134
                                         3.0
-0.674134
2
            3.2
                  -0.341908
                                         3.2
-0.341908
3
            3.1 -0.597395
                                         3.1
-0.597395
            3.6 0.646835
                                    3.6
0.646835
  petal width (cm) petal width (cm) sepal length (cm)
sepal length (cm)
            0.2
                 -0.024168
                                         5.1
-2.264703
                                         4.9
            0.2
                   -0.103007
-2.080961
2
            0.2
                   -0.028377
                                         4.7
-2.364229
            0.2 0.065956
                                          4.6
-2.299384
            0.2 0.035923
                                         5.0
4
-2.389842
shape (150, 8)
******
Accuracy= 0.92
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 10 40]]
```

```
Status: Improved
Features petal length (cm) petal length (cm) sepal length
(cm) sepal length (cm) \
0
             1.4
                    -0.127706
                                           5.1
-2.264703
             1.4 -0.234609
                                           4.9
-2.080961
             1.3
                         0.044201
                                                4.7
2
    -2.364229
3
             1.5
                         0.091290
                                                4.6
    -2.299384
            1.4
                                                5.0
4
                     0.015738
    -2.389842
  sepal length (cm) sepal length (cm) petal length (cm)
petal length (cm)
             5.1 -2.264703
                                            1.4
-0.127706
             4.9
                    -2.080961
                                            1.4
-0.234609
             4.7
                    -2.364229
                                           1.3
2
    0.044201
             4.6 -2.299384
                                           1.5
3
    0.091290
             5.0 -2.389842
                                           1.4
4
    0.015738
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 45 5]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal length
(cm) sepal length (cm) \
0
             0.2
                 -0.024168
                                           5.1
-2.264703
             0.2 -0.103007
                                           4.9
-2.080961
             0.2 -0.028377
                                           4.7
-2.364229
```

3 -2.299384	0.2	0.065956	4.6
4 -2.389842	0.2	0.035923	5.0
-	-	al width (cm) petal leng	(cm)
petal length (0 -0.127706	0.2	-0.024168	1.4
1 -0.234609	0.2	-0.103007	1.4
0.044201	0.2	-0.028377	1.3
3 0.091290	0.2	0.065956	1.5
4 0.015738	0.2	0.035923	1.4
shape (150, 8)			
**************************************		66666	
Confusion Matr			
[0 47 3] [0 11 39]]			
Status: Improve			
Features peta (cm) sepal wi	=	cm) petal length (cm) s \	sepal width
0			3.5
0.480027	1.4	-0.234609	3.0
-0.674134 2	1.3	0.044201	3.2
-0.341908 3	1.5	0.091290	3.1
-0.597395 4	1.4	0.015738	3.6
0.646835			
<pre>petal width width (cm)</pre>	(cm) pet	al width (cm) petal widt	ch (cm) petal
0 -0.024168	0.2	-0.024168	0.2

```
0.2
            0.2 -0.103007
1
-0.103007
            0.2
                    -0.028377
                                           0.2
-0.028377
            0.2 0.065956
3
                                      0.2
0.065956
                                      0.2
            0.2 0.035923
0.035923
shape (150, 8)
******
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Status: Improved
Features petal width (cm) petal width (cm) sepal width (cm)
sepal width (cm) \
            0.2 -0.024168
                                           3.5
0.480027
            0.2
                   -0.103007
1
                                           3.0
-0.674134
                                           3.2
            0.2
                    -0.028377
-0.341908
                    0.065956
3
            0.2
                                      3.1
-0.597395
4
            0.2 0.035923
                                      3.6
0.646835
  sepal length (cm) sepal length (cm) sepal length (cm)
sepal length (cm)
            5.1 -2.264703
                                           5.1
-2.264703
             4.9
                   -2.080961
                                           4.9
1
-2.080961
            4.7
                    -2.364229
                                           4.7
2
-2.364229
3
             4.6
                    -2.299384
                                           4.6
-2.299384
4
             5.0 -2.389842
                                           5.0
-2.389842
shape (150, 8)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
            lambda1 lambda2 lambda3 lambda4
sepal-width
36879 0.091361 -0.181192 0.128978 0.229960
                                                3.0
31609 -0.110196 -2.654073 -0.046790 -0.013761
                                                3.6
37957 1.440151 -0.046988 0.163630 0.235770
                                                3.4
29877 -2.203833 0.009216 -0.153029 -0.049372
                                                3.5
24356 -2.218451 -0.728676 -0.230911 -0.002425
                                                3.3
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 3)
            lambda1 lambda2 lambda3
Features
30 -2.140122 -0.504541 -0.075008
114 1.467645 -0.442272 1.003870
35 -2.207809 -0.206107 -0.225442
78 0.664800 -0.225928 0.085864
10 -2.166310 1.043691 -0.268681
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features
         lambda1 lambda2 lambda3
                                       lambda4
64 -0.033355 -0.439003 0.194933 -0.109048
43 -1.964448 0.472327 0.309601 -0.177093
59 0.011426 -1.034018 0.538899 0.028461
88 0.069588 -0.219503 0.291579 0.147145
14 -2.198741 1.860057 -0.472901 -0.194732
final shape (150, 4)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
            lambda1 lambda2 lambda3 lambda4
sepal-length
38264 2.751873 0.800409 -0.582309 0.101384
                                                5.8
39168 1.602679 -0.421700 0.023186 -0.058332
                                                5.7
                                                5.2
24932 -2.207588 1.483609 -0.005344 -0.188817
13001 1.048728 0.522052 -0.395786 -0.037209
                                                5.8
15925 0.367018 -1.561503 0.986893 0.133124
                                                5.0
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 3)
Features
         lambda1 lambda2 lambda3
137 1.346292 0.422431 0.180875
37 -2.527332 0.592293 0.019436
52 1.240979 0.616298 -0.554007
146 1.564580 -0.896687 -0.026371
21 -2.207013 0.924121 0.159865
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
             lambda1 x lambda2 lambda3 lambda4
Features
lambda1 y
27696 -2.109975 -0.460202 -0.170275 -0.029023 0.227717
15106 1.844569 0.870421 1.005401 0.049250 0.367018
      1.256509 -0.077256 -0.727155 -0.039689 1.061095
33983
38697 2.302439 0.420066 -0.651706 0.238041 1.521170
27693 -2.109975 -0.460202 -0.170275 -0.029023 -0.362183
final shape (150, 5)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
         lambda1 lambda2 lambda4 petal-width
Features
21557 2.040558 0.867521 -0.045187
                                      1.8
14009 -0.362183 -2.019238 -0.019571
                                      1.4
33495 0.632858 -0.416388 0.274220
                                       0.3
21902 1.564580 -0.896687 -0.220192
                                       0.2
43453 1.852045 0.676128 -0.195195
                                       1.8
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
         lambda1 lambda2 lambda3 lambda4
Features
petal-length
5584 -2.527332 0.592293 0.019436 0.136505
                                               1.5
7714
     0.731337 0.594615 -0.094122 -0.004904
                                               3.6
                                               5.1
17092 1.260115 -1.162260 0.580249 -0.099157
30267 0.731337 0.594615 -0.094122 -0.004904
                                               6.7
6594 -1.964448 0.472327 0.309601 -0.177093
                                               5.7
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features lambda1 lambda2 lambda3 lambda4
146 1.564580 -0.896687 -0.026371 -0.220192
90 0.279078 -1.120029 0.094488 0.270657
24 -2.227163 0.137254 0.117994 0.270140
110 1.364175 0.692756 0.284612 -0.107860
126 1.175104 -0.316394 0.129938 -0.125420
final shape (150, 4)
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
             lambda2 lambda3 lambda4 petal-length
Features
26000 0.085559 0.034489 -0.151141
                                       4.7
23604 0.223148 -0.088695 0.024612
                                       4.6
24851 2.686284 0.030527 -0.050534
                                       5.1
39467 -1.162260 0.580249 -0.099157
                                       1.4
14233 -0.855730 0.130890 0.107402
                                       5.1
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
             lambda1 lambda2 lambda3 lambda4
sepal-length
33828  0.874274  0.250793  -0.472579  -0.101716
                                                6.0
                                                6.7
32824 1.225094 -1.622244 -0.482304 -0.225900
9295  0.440693  -0.063295  0.205074  -0.040126
                                                6.7
13273 0.069588 -0.219503 0.291579 0.147145
                                                6.1
34397 -0.040259 -1.058719 -0.319573 -0.064788
                                                4.6
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
         lambda1 lambda2 x lambda3 lambda4
Features
lambda2 y
5683 -2.527332 0.592293 0.019436 0.136505 -0.292923
32616 0.158810 -0.792096 -0.302037 0.205298 -0.196312
11640 1.358405 0.331312 -0.260827 -0.066828 -1.120029
               1.013922 0.298451 0.061644 -0.292923
41233 1.700734
42870 2.798770 0.856803 -0.542906 -0.295881 0.910467
final shape (150, 5)
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
             lambda1 lambda2 lambda3
Features
                                       lambda4 x
lambda4 y
2541 -2.207588 1.483609 -0.005344 -0.188817 -0.469697
28317 -2.429633 -0.904180 0.193255 0.009738
                                           0.273807
22195 1.521170 0.269069 0.180178 -0.119171 -0.389257
1263 -2.334640 -1.115328 0.145077 0.026859 0.164807
15043 1.844569 0.870421 1.005401 0.049250 -0.177093
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
 [ 0 9 41]]
Dataset shape= (150, 5)
Features
            lambda1 lambda2 lambda3
                                       lambda4 x
lambda4 y
21102 2.014810 0.613886 0.428333 -0.247538 -0.059184
36262 0.624570 0.024923 -0.020481 0.147686 -0.146415
24650 -2.198741 1.860057 -0.472901 -0.194732 -0.034834
9731 -0.033355 -0.439003 0.194933 -0.109048 0.211676
41647 1.020951 0.064346 0.337716 0.008654 0.019861
final shape (150, 5)
Confusion Matrix
[[50 0 01]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
             lambda1 lambda2 lambda3 lambda4
petal-length
                                                 5.1
44092 2.040558 0.867521 0.338144 -0.045187
19572 2.435954 0.259284 -0.727816 0.017923
                                                 4.9
3476 -1.818670 0.085559 0.034489 -0.151141
                                                 1.6
10151 0.158810 -0.792096 -0.302037 0.205298
                                                 5.1
18235 0.977981 -0.571764 0.828127 -0.027756
                                                 4.5
final shape (150, 5)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features
            lambda1
                     lambda2 lambda3
                                       lambda4
   0.130795 -1.562272 -0.149983 0.009403
80
115 1.590077 0.676245 0.638429 -0.191863
12 -2.218451 -0.728676 -0.230911 -0.002425
131 2.304928 2.626323 -0.493474 0.211676
116 1.471431 0.255622 0.037431 0.155330
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features lambda1 lambda3 lambda4 petal-width
21266 1.901784 0.130075 -0.469697
                                      1.8
38935 2.259777 0.397552 -0.104839
                                       1.6
5237 -2.109975 -0.170275 -0.029023
                                       1.8
                                       0.2
21783 1.870503 0.256274 -0.389257
8635 -0.487323 0.249265 0.040520
                                       1.6
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
         lambda1 lambda2 lambda3 x lambda4
Features
lambda3 y
4061 -2.168577 0.527150 -0.206816 -0.010275 0.093759
8219 1.075475 -0.208421 -0.398256 -0.104737 -0.267537
38870 2.259777 1.921010 0.397552 -0.104839 -0.421293
26272 -1.951846 -0.625619 -0.305641 -0.043562
                                          0.332179
2985 -2.343369 1.127849 0.132630 0.037756 -0.542906
final shape (150, 5)
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
                                        lambda4
Features
             lambda1 lambda2 lambda3
49 -2.203833 0.009216 -0.153029 -0.049372
64 -0.033355 -0.439003 0.194933 -0.109048
53 0.407483 -1.754404 -0.023102 -0.065769
36 -2.045146 0.661558 -0.484537 -0.196359
48 -2.229447 0.997960 -0.181493 0.014928
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
             lambda1 x lambda2 lambda4
Features
lambda1 y
      1.333232 -0.481811 -0.005428 -0.139959 1.240979
41002
26076 -1.818670 0.085559 0.034489 -0.151141 1.175104
6219 -1.858122 -2.337415 -0.204234 -0.289864 0.164918
27955 -2.045146 0.661558 -0.484537 -0.196359 0.388687
43620 2.014810 0.613886 0.428333 -0.247538 2.037716
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
         lambda1 lambda2 lambda3 lambda4
Features
sepal-length
841 -2.075631 1.489178 0.026968 -0.006608
                                                 6.1
21501 2.040558 0.867521 0.338144 -0.045187
                                                 6.4
19403 1.863648 0.562291 -0.715634 0.208215
                                                 5.5
35072 1.061095 -0.633843 0.105311 0.183968
                                                7.7
30316 1.240979 0.616298 -0.554007 -0.009423
                                                 5.4
final shape (150, 5)
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
            lambda1 x lambda2 lambda4
Features
lambda1 y
3846 -1.951846 -0.625619 -0.305641 -0.043562 0.227717
     1.954327 1.007778 -0.419985 0.218338 0.283477
      1.564580 -0.896687 -0.026371 -0.220192 -1.818670
21923
31084 - 0.487323 - 1.852429 0.249265 0.040520 - 2.109975
228 -2.080961 -0.674134 -0.234609 -0.103007 0.664800
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
         lambda1 lambda2 lambda3 x lambda4
Features
lambda3 y
2234 -2.198741 1.860057 -0.472901 -0.194732 -0.164724
16354 2.259777 1.921010 0.397552 -0.104839 0.015738
44547 1.564580 -0.896687 -0.026371 -0.220192 0.180178
7531 1.101781 0.862972 -0.684586 -0.034834 -0.270467
9742 -0.033355 -0.439003 0.194933 -0.109048
                                         0.530160
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features lambda1 lambda2 lambda3
                                      lambda4
86 1.048728 0.522052 -0.395786 -0.037209
137 1.346292 0.422431 0.180875 0.215421
58 0.927902 0.032226 -0.596169 0.029880
127 1.020951 0.064346 0.337716 0.008654
136 1.576256 1.068581 0.945854 -0.035606
final shape (150, 4)
Confusion Matrix
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
             lambda1
                      lambda2 lambda3 lambda4
Features
petal-length
27275 -1.831595 0.423695 -0.270467 -0.239870
                                                 6.0
15335 2.205267 0.562010 -0.202914 -0.059184
                                                 1.2
43982 2.040558 0.867521 0.338144 -0.045187
                                                 1.5
14582 0.576388 -0.154874 -0.271650 0.019861
                                                 1.5
36473 -0.362183 -2.019238 0.105821 -0.019571
                                                 1.7
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
             lambda1 x lambda2 lambda4
Features
lambda1 y
17093
      1.260115 -1.162260 0.580249 -0.099157
                                            2.040558
29849 -2.229447 0.997960 -0.181493 0.014928 0.960656
28278 -2.429633 -0.904180 0.193255 0.009738 0.664800
28571 -2.286475 0.441715 0.034895 -0.106983 0.476287
13478 0.283477 -1.329325 0.089410 -0.008906 1.788350
final shape (150, 5)
Confusion Matrix
[[50 0 01]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
             lambda1 lambda2 lambda3 lambda4
petal-length
                                                 4.1
18688 1.700734 1.013922 0.298451 0.061644
                                                 4.9
10872 1.234178 -0.933326 -0.368412 0.009945
651 -2.389842 0.646835 0.015738 0.035923
                                                 4.5
31116 -0.487323 -1.852429 0.249265 0.040520
                                                 4.5
27108 -2.140122 -0.504541 -0.075008 0.048189
                                                 5.8
final shape (150, 5)
```

```
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 3)
Features
            lambda1
                     lambda3
                             lambda4
21 -2.207013 0.159865 -0.059597
17 -2.190350 -0.044215 -0.093090
132 1.862703 0.354149 -0.100010
   -2.334640 0.145077 0.026859
78 0.664800 0.085864 0.036440
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 3)
            lambda2
Features
                    lambda3 lambda4
145 0.386966 0.256274 -0.389257
79 -1.058719 -0.319573 -0.064788
141 0.689575 0.130075 -0.469697
96 -0.384920 0.156213 0.132606
   0.024923 -0.020481 0.147686
91
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
         lambda1 x lambda2 lambda3 lambda4
lambda1 y
40136 2.426329 2.556661 -0.127881 0.273807 1.048728
      1.564580 -0.896687 -0.026371 -0.220192 -2.264703
21900
13911 0.336530 -0.988404 -0.199390 -0.006531 1.602679
345 -2.364229 -0.341908 0.044201 -0.028377 -2.069744
31782 0.440693 -0.063295 0.205074 -0.040126 1.862703
final shape (150, 5)
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
            lambda1 lambda2 x lambda3 lambda4
Features
lambda2 y
11723 0.664800 -0.225928 0.085864 0.036440
                                        0.085559
23480 - 2.444029 \quad 0.047644 \quad 0.335470 \quad 0.036776 \quad -1.562272
31492 0.011426 -1.034018 0.538899 0.028461 -0.698870
16397 2.259777 1.921010 0.397552 -0.104839 -0.386247
11880 -0.040259 -1.058719 -0.319573 -0.064788 -0.504541
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features lambda2 lambda3 x lambda4 lambda3 y
28499 0.268879 -0.175884 -0.007047 0.528249
13599 -1.120029 0.094488 0.270657
                                0.091879
26104 0.137254 0.117994 0.270140 0.015738
38151 0.295045 0.395628 0.016298 -0.094122
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
           lambda1 lambda2 lambda3 lambda4
sepal-length
                                              7.7
28935 -2.553638 -0.479101 0.305766 0.066601
                                              5.1
41121 1.700734 1.013922 0.298451 0.061644
41467 1.175104 -0.316394 0.129938 -0.125420
                                              5.8
     1.101781 0.862972 -0.684586 -0.034834
                                              4.7
5197 -2.109975 -0.460202 -0.170275 -0.029023
                                              6.2
final shape (150, 5)
```

```
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
             lambda1 x lambda2 lambda3
Features
                                        lambda4
lambda1 y
16086 2.302439 0.420066 -0.651706 0.238041 -2.045146
27772 -2.207809 -0.206107 -0.225442 -0.168908 -2.774345
28526 -2.286475 0.441715 0.034895 -0.106983 -2.051151
32828 1.225094 -1.622244 -0.482304 -0.225900 1.788350
32345 0.875407 0.509064 -0.503511 -0.104944 0.091361
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
 [ 0 9 41]]
Dataset shape= (150, 3)
         lambda1 lambda3 lambda4
Features
106 0.367018 0.986893 0.133124
15 -2.262215 0.030527 -0.050534
5
   -2.075631 0.026968 -0.006608
  0.130795 -0.149983 0.009403
84 0.223979 0.665250 0.254828
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
           lambda1
Features
                     lambda2
                             lambda3
                                       lambda4
65 0.875407 0.509064 -0.503511 -0.104944
87 1.044531 -1.382989 -0.688296 -0.136836
91 0.624570 0.024923 -0.020481 0.147686
94 0.288586 -0.855730 0.130890 0.107402
83 1.061095 -0.633843 0.105311 0.183968
final shape (150, 4)
Confusion Matrix
[[50 0 0]
```

```
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
         lambda1 lambda2 x lambda3 lambda4
Features
lambda2 y
27123 -2.140122 -0.504541 -0.075008 0.048189 -0.481811
6193 -1.858122 -2.337415 -0.204234 -0.289864 0.472327
41816 1.788350 -0.187361 0.270658 -0.031088 0.255622
41780 1.788350 -0.187361 0.270658 -0.031088 -1.562272
31652 0.440693 -0.063295 0.205074 -0.040126 -0.341908
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
         lambda1
Features
                     lambda2
                             lambda3
                                       lambda4
127 1.020951 0.064346 0.337716 0.008654
86 1.048728 0.522052 -0.395786 -0.037209
30 -2.140122 -0.504541 -0.075008 0.048189
133 1.114148 -0.292923 -0.183488 0.186344
126 1.175104 -0.316394 0.129938 -0.125420
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 3)
         lambda2 lambda3
                             lambda4
Features
145 0.386966 0.256274 -0.389257
115 0.676245 0.638429 -0.191863
5
    1.489178 0.026968 -0.006608
10
    1.043691 -0.268681 -0.016731
42 -0.479101 0.305766 0.066601
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
```

```
[ 0 9 41]]
Dataset shape= (150, 5)
Features
             lambda1
                     lambda2
                              lambda3 lambda4
sepal-width
23102 -2.389842 0.646835 0.015738 0.035923
                                                3.2
27504 -2.446177 2.150728 -0.082668 0.048214
                                                2.8
                                                3.0
1455 -2.184328 -0.469014 -0.253766 0.039899
14906 0.256731 -0.598852 0.091879 0.058622
                                                3.3
33020 0.737683 0.396572 0.616526 0.083284
                                                3.4
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
         lambda1 lambda2 lambda3 lambda4
petal-length
25773 -2.207013 0.924121 0.159865 -0.059597
                                                4.9
                                                3.8
21080 2.014810 0.613886 0.428333 -0.247538
30763 0.388687 -0.593284 0.124192 0.240831
                                                1.1
10881 1.234178 -0.933326 -0.368412 0.009945
                                                3.7
43998 2.040558 0.867521 0.338144 -0.045187
                                                1.5
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 3)
                              lambda4
             lambda1
Features
                     lambda3
   1.048728 -0.395786 -0.037209
86
 -2.264703 -0.127706 -0.024168
111 1.602679 0.023186 -0.058332
70
   0.737683 0.616526 0.083284
128 1.788350 0.270658 -0.031088
final shape (150, 3)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
```

```
[ 0 9 41]]
Dataset shape= (150, 5)
        lambda1 lambda2 x lambda3 lambda4
Features
lambda2 y
34650 0.023453 -1.572476 -0.241552 0.032772 0.480027
3452 -1.818670 0.085559 0.034489 -0.151141 -0.341908
21191 1.901784 0.689575 0.130075 -0.469697 -2.337415
23959 -2.184328 -0.469014 -0.253766 0.039899 1.921010
17243 1.467645 -0.442272 1.003870 -0.275659 0.867521
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
        lambda1 lambda2 lambda3 lambda4
Features
sepal-width
19860 1.862703 -0.178549 0.354149 -0.100010
                                             2.0
21958 1.564580 -0.896687 -0.026371 -0.220192
                                             2.9
461 -2.299384 -0.597395 0.091290 0.065956
                                             3.4
39781 1.590077 0.676245 0.638429 -0.191863
                                             3.4
15452 1.440151 -0.046988 0.163630 0.235770
                                             3.2
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features
            lambda1 lambda2 x lambda4 lambda2 y
21444 1.157882 -0.698870 0.040521
                               1.049169
11504 1.256509 -0.077256 -0.039689 0.295045
36252 0.624570 0.024923 0.147686 0.562010
2300 -2.262215 2.686284 -0.050534 0.862972
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
```

```
[ 0 9 41]]
Dataset shape= (150, 4)
Features lambda1 lambda2 x lambda3 lambda2 y
33571 0.632858 -0.416388 -0.291896 -0.571764
26104 -2.227163  0.137254  0.117994  0.646835
21917 1.564580 -0.896687 -0.026371
                                 0.488838
23767 -2.334640 -1.115328 0.145077 -0.792096
28522 -2.286475 0.441715 0.034895
                                 0.458344
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 5)
Features
         lambda1 lambda2 x lambda3 lambda4
lambda2 y
27595 -2.446177 2.150728 -0.082668 0.048214 0.386966
42513 1.114148 -0.292923 -0.183488 0.186344 -0.186225
38135 1.867812 0.295045 0.395628 0.016298 -0.206107
28242 -2.429633 -0.904180 0.193255 0.009738 -0.479101
30839 0.388687 -0.593284 0.124192 0.240831 -1.329325
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
Dataset shape= (150, 4)
Features lambda1 lambda3 lambda4 x lambda4 y
13920 0.336530 -0.199390 -0.006531 -0.167951
                       0.254828
35184 0.223979 0.665250
                                 0.254828
20135 1.202473 -0.164724 0.489483 -0.168908
8479 0.746530 0.148969 0.077370 -0.064788
1533 -2.166310 -0.268681 -0.016731 0.048214
final shape (150, 4)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
[ 0 9 41]]
```

```
Dataset shape= (150, 5)
Features
             lambda1 lambda2 lambda3 lambda4
petal-width
13985 -0.362183 -2.019238 0.105821 -0.019571
                                                 0.2
27628 -2.109975 -0.460202 -0.170275 -0.029023
                                                  0.2
                                                 0.2
33164 0.476287 -0.417320 -0.264952 -0.113568
16027 0.367018 -1.561503 0.986893 0.133124
                                                 1.8
33170 0.476287 -0.417320 -0.264952 -0.113568
                                                 0.2
final shape (150, 5)
Confusion Matrix
[[50 0 0]
[ 0 48 2]
 [ 0 9 41]]
Dataset shape= (150, 5)
Features
            lambda1 x lambda2 lambda3 lambda4
lambda1 y
7517 1.101781 0.862972 -0.684586 -0.034834 -2.190350
5714 -2.429633 -0.904180 0.193255 0.009738 -2.198741
      1.114148 -0.292923 -0.183488 0.186344
20032
                                           0.241538
33707 0.702661 -0.063412 -0.446027 -0.043458 2.302439
27043 -2.140122 -0.504541 -0.075008 0.048189 -1.964448
```

final shape (150, 5)