HW 5

Q1

2:

Statistic

Feature	μ0	σ0	μ1	σ1	μ all	σ all
Sepal Length	5.936	0.516	6.588	0.636	6.262	0.663
Sepal Width	2.77	0.314	2.974	0.322	2.872	0.333
Petal Length	4.26	0.470	5.552	0.552	4.906	0.826
Petal Width	1.326	0.198	2.026	0.275	1.676	0.425

3:

For Setosa

	sepal-length	sepal-width	petal-length	petal-width
sepal-length	1.000000	0.746780	0.263874	0.279092
sepal-width	0.746780	1.000000	0.176695	0.279973
petal-length	0.263874	0.176695	1.000000	0.306308
petal-width	0.279092	0.279973	0.306308	1.000000

Sepal-width and sepal-length highest correlations is :0.746780

Sepal-width and petal-width lowest correlations is :0.176695

For Versicolor

	sepal-length	sepal-width	petal-length	petal-width
sepal-length	1.000000	0.525911	0.754049	0.546461
sepal-width	0.525911	1.000000	0.560522	0.663999
petal-length	0.754049	0.560522	1.000000	0.786668
petal-width	0.546461	0.663999	0.786668	1.000000

Petal-width and petal-length highest correlations is :0.786668

Sepal-length and sepal-width lowest correlations is :0.525911

For Virginica

	sepal-length	sepal-width	petal-length	petal-width
sepal-length	1.000000	0.457228	0.864225	0.281108
sepal-width	0.457228	1.000000	0.401045	0.537728
petal-length	0.864225	0.401045	1.000000	0.322108
petal-width	0.281108	0.537728	0.322108	1.000000

Petal-length and sepal-length highest correlations is :0.864225

Petal-width and sepal-length lowest correlations is :0.281108

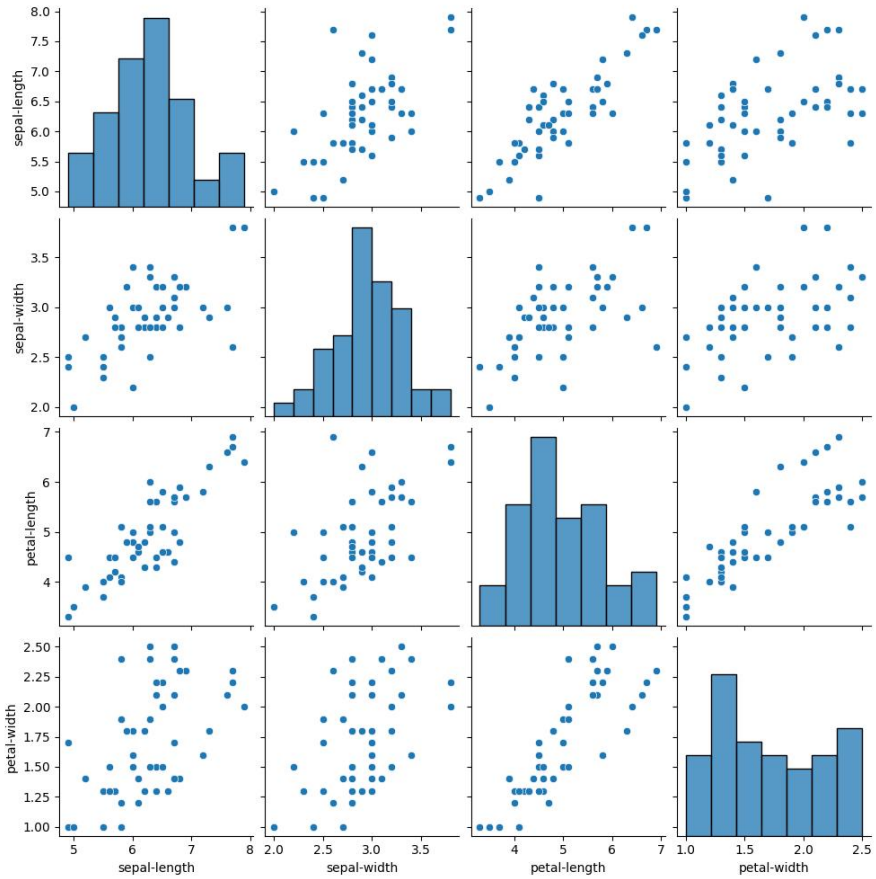
4:

Virginica has Petal-length and sepal-length highest correlations is :0.864225

Setosa Sepal-width and petal-width lowest correlations is :0.176695

Q2

1:



2:

Classifier for sepal-length:

If >6 ; label = 0, else = 1

Classifier for sepal-width:

If >2 ; label = 0, else = 1

Classifier for petal-length:

If >5 ; label = 0, else = 1

Classifier for petal-width:

If >1; label = 0, else = 1

Classifier	TP	TN	FP	FN	Accuracy
1:sepal-length	14	20	6	10	68%
2:sepal-width	1	26	0	23	54%
3:petal-length	24	21	5	0	90%
4:petal-width	4	26	0	20	60%

3: Sepal width has the most Confusion Matrix

Q3

1:

Ensembles of weak learners

Classifier	TP	TN	FP	FN	Accuracy
1,2,3 Sepal-length	14	20	6	10	68%
1,2,4 Sepal-width	24	0	26	0	48%
1,3,4 Petal-length	24	5	21	0	57%
2,3,4 petal-width	24	0	26	0	48%

2: Sepal-width and petal-width have the most Confusion Matrix

3: The ensemble results are easier than the weak learners which influenced by certain conditions which has certain values

Q4

1:

Sepal length: If p0 >= p1, 0, else 1

Sepal width:If p0 <= p1, 0, else 1

Petal length:If (p0- p1)>=0, 0, else 1

Petal width:If (p0-p1)<=1, 0, else 1

Density based weak learners

Classifier	TP	TN	FP	FN	Accuracy
1:sepal-length	7	7	19	17	28%
2:sepal-width	3	17	9	21	40%
3:petal-length	0	21	5	24	42%
4:petal-width	0	26	0	24	52%

2: Petal-width has the most Confusion Matrix

Q5:

1

Density-based Ensembles

Classifier	TP	TN	FP	FN	Accuracy
1,2,3 Sepal-length	24	0	26	0	48%
1,2,4 Sepal-width	24	0	26	0	48%
1,3,4 Petal-length	24	0	26	0	48%
2,3,4 petal-width	24	0	26	0	48%

2: They have the same Confusion Matrix

3:Compared with the weak learner, the ensemble result has some conflicting conditions that lead to an error in the confusion matrix

Q6

1:Compared with the weak learner, the ensemble result has some conflicting conditions that lead to an error in the confusion matrix