

Assignment 1 – Solution

Introduction to Deep Learning

Section: H4 | Name: Muhammad Burhan | ID: L1F21BSCS1059 | Date: 08-April-2025

Q1: How many total samples are present in the Iris dataset, and how many belong to each class?

Total Samples in Dataset	150
Setosa	50
Versicolor	50
Virginica	50

NOTE: Got this information through Python using Pandas. The notebook file link is attached at the end.

Q2: What are the minimum, maximum, and average values of the petal length feature?

Petal Length	
Minimum	1.0
Average (Mean)	3.758667
Maximuim	6.9

NOTE: Got this information through Python using Pandas. The notebook file link is attached at the end.

Q3: Which feature appears to be the most useful for distinguishing between different species? Justify your answer with reasoning.

	Petal Length In Cm		Petal Width In Cm		Sepal Length In Cm		Sepal Width In Cm	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Iris-setosa	1.464	0.174	0.224	0.107	5.006	0.352	3.418	0.381
Iris-versicolor	4.26	0.47	1.326	0.198	5.936	0.516	2.77	0.314
Iris-virginica	5.552	0.552	2.026	0.275	6.588	0.636	2.974	0.322

NOTE: Got this information through Python using Pandas. The notebook file link is attached at the end.

As it show a clear sepration in mean values specially between Iris-setosa(1.464) and others virsicolor(4.26), virginica(5.552). also the standard deviations of setosa(0.174) is small as compare to versicolor(0.47) and virginica(0.552) show less verity in setosa type. Thus, Petal Length is most useful feature for distinguishing between different species.

Q4: What type of machine learning problem does the Iris dataset represent, and why?

A4: As we are distinguishing between different species of Iris flower so this is a classification problem. As the number of target classes is more than 2 this it become a multi-class classification problem.

Q5: If you were to use a deep learning model for classifying the Iris dataset, which type of neural network architecture would you choose, and why?

A5: For this multi-class classification problem I'll be using Feedforward Neural Network (FNN) or Multi-layer Perceptron (MLP) Model as our dataset is not very large and number in features are small (4 features) and MLP us very good at working with fixed sizes input vectors. MLP is designed for structures numerical features and for multi-class classification problems; this property of MLP matched to our dataset, as iris dataset is in tabular form consist of numerical values.