MLFA LAB
MidSemester Test

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Experiment 1

Effect of K on Accuracy of KNN Model:

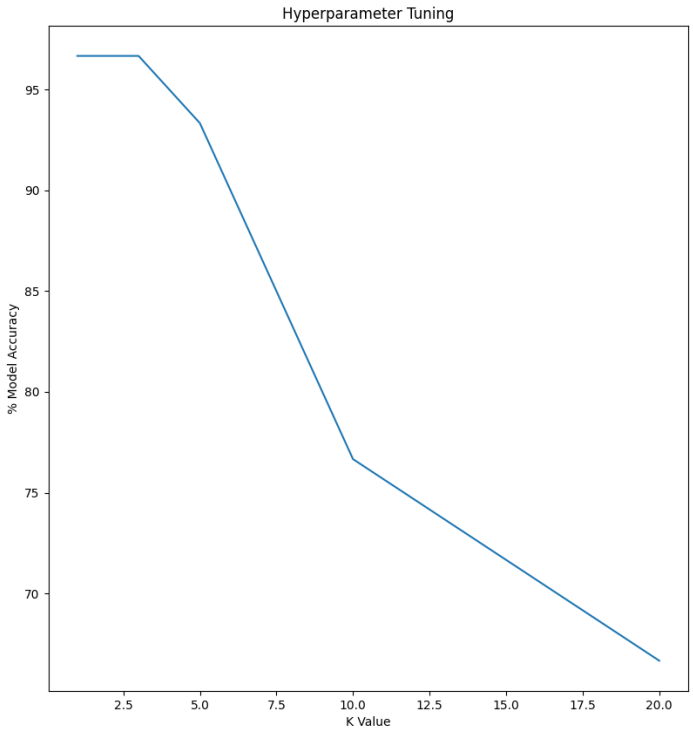

Figure 1: Effect of K

Remarks:

1. At **high values of K**, the Decision Boundary is over smoothened. This results in a **steady decline** of accuracy. This is a sign of **Underfitting**.
2. At **lower values of K** the **accuracy is good**.
3. Optimal value of K is **3** (**I chose the higher K in case the accuracies are equal**).

Experiment 2

Effect of Noise on KNN model's performance

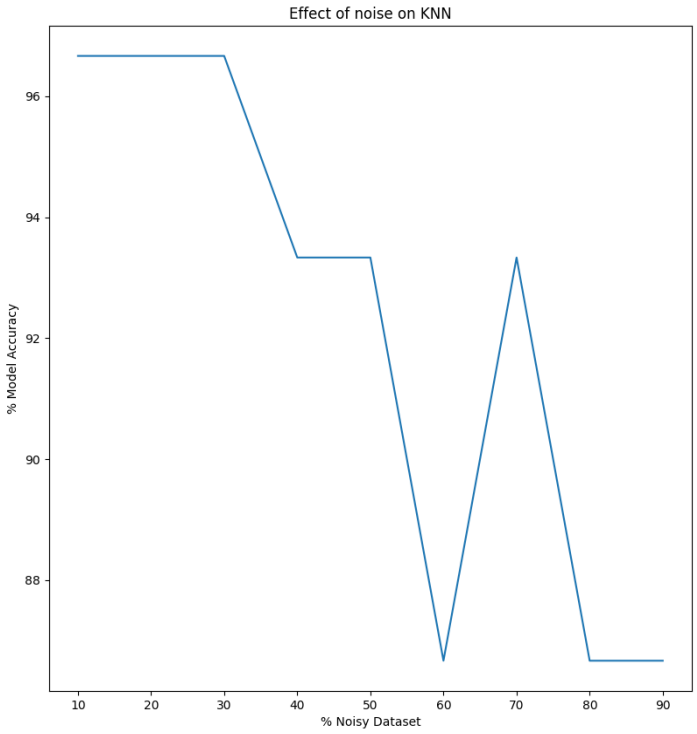

Figure 2: Percentage Accuracy v/s Noise

Percentage Accuracy for the noise values:

Noise %	Accuracy %
10	96.67
20	96.67
30	96.67
40	93.33
50	93.33
60	86.7
70	93.33
80	86.7
90	86.67

Table 1: Percent Accuracy

Remarks:

1. We notice a consistent pattern of high accuracy when a small percentage of the Train Set is noisy.
2. However, there is an unexpected increase in the accuracy when 70% of the Train Set is noisy. This is purely random and by changing the seed, one can notice that this effect is no longer visible.
3. We can notice that **KNN is very robust to noise**, as we see a **model accuracy of 96.67 %** for **up-to 30%** of noisy Train Set(Almost one-thirds of the set is noisy). Note that **96.67 % is** the Percentage Accuracy obtained in the **noiseless case** too.