

Q5. This uses the GISETTE dataset which is a handwritten digit recognition problem. This problem is to separate the highly confusable digits '4' and '9'.

Part a: When all the 6000 samples are used to train and testing is done using the validation set with soft margin SVM with kernel as **linear** . The **training error** is obtained as **0** and **testing error** is obtained as **2.4** with the **total number of support vectors** as **1084**.

Part b: Here 2 more kernels **rbf** with gamma value as 0.001 and **poly** as degree =2 and coef0 = 1 which gives the value of training and testing error as follows

Kernel Type	Training error	Testing error
RBF	0	50
Poly	0	2.099