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Question 1 [MNIST Dataset]

1. **Hyperparameters of SVC classifiers (kernel = "Linear") after tuning:**
        Regularization, C = 1.0
2. **The number of updates k required before the SVM classifier converges**
        Using parameter "verbose = True" in SVC( )
        K = 8130644
3. **Weights learnt by the linear classifier :** all the weights are in file ''weights.txt''
4. **The margin :** all the margins are in file ''margins.txt''
5. **Performance**
    ▪ Metrics Used : Classification rate, Confusion Matrix
    ▪ Test accuracy = 96.57 % (Classification rate)

Question 2 [Iris Dataset]

Polynomial kernel

Degree	4	5	8
Accuracy	95 %	94 %	94 %

Cross Validation (K= 10 Fold) Mean Accuracy = 97 %

Gaussian kernel

Gamma	0.01	0.02	0.05
Accuracy	95%	95%	96%

After Hyperparameter tuning best parameters
        Gamma (γ) = 0.05
Best Accuracy Score =   96%

Sigmoidal kernel

Gamma	0.01			0.02			0.03		
Beta	-1	-2	-4	-1	-2	-3	-1	-2	-3
Accuracy	91 %	82 %	78%	65%	88%	65%	45%	68%	66%

After Hyperparameter tuning best parameters
        Beta (β) = -1
        Gamma (γ) = 0.01
        C = 0.8   Best Accuracy Score =   96.6 %