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A)

Deciding alpha: As the dataset was large, very small alpha would take too much time. Varied the alpha values multiplying by 10 each time, and observed the effect in some iterations.

B) Results:

Regularization Parameter Value comparisons

Lambda	Error after 90 iterations
2	0.4019315537
5	0.3987769015
10	0.3963991855
25	0.3941284325
35	0.3947738694
50	0.4077619971
100	0.4011556675
200	0.3937565718

RMSE Errors on test set

BGD- 0.9631131 (SGD not feasible, takes too much time!)

With Reg-0.93846214

With bias+reg-0.93794073

SVD:-0.89248 (RMSE error)

NMF-0.94680129

The advantage of NMF can be obtained when we are able to see aspects, users affinity towards them and analyse their composition. As the dataset is large and the chosen k value is 346, it becomes hard to interpret any such semantic sense out of the data.