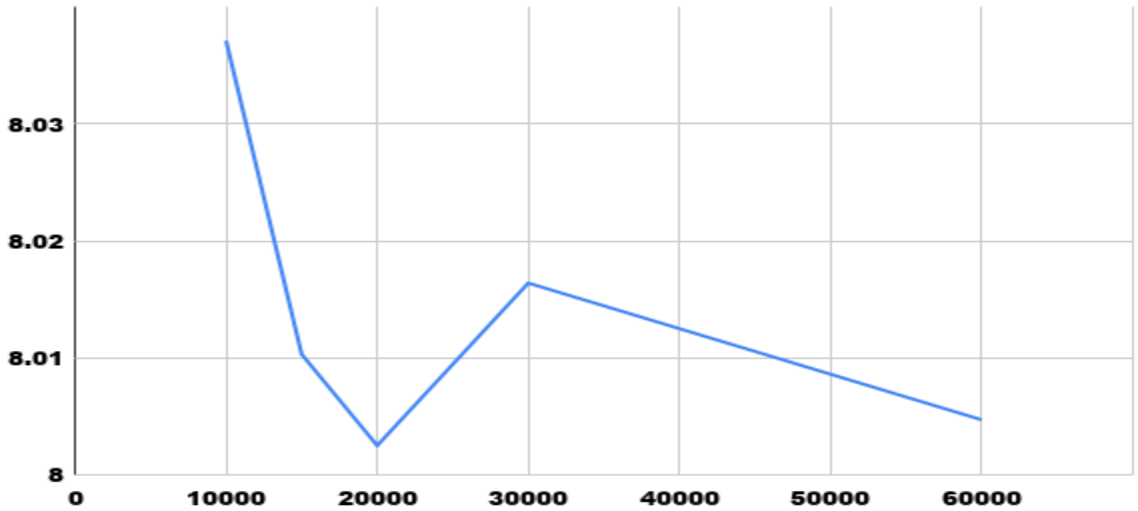
ASSIGNMENT – 1 (CS419M)

Name : Bele Prathmesh Pravinrao
Roll No.: 180110020

- RMSE on dev.csv with **gradient_descent(phi, y)** – **8.00470963805984**
- Absolute difference between RMSE from gradient_descent and closed_soln – **2.2782842279411852e-10**
- Stopping Criterion – **L2_norm_of_gradient <= eps** ; where eps is a number close to zero
- Difference between errors of gradient_descent and sgd – **0.691013137628044**
- RMSE for pnorm(phi , y, p):
  p = 2 - **8.004702405264807**
  p = 4 - **8.004881722808008**
- Choice of basis functions, and respective RMSE:
  Basis 1 = $\mathbf{x_0 \sin(x_0), x_1 \sin(x_1)}$, …….
  RMSE with basis 1 – **9.041047371474969**

  Basis 2 = $\mathbf{x_0 + x_1, x_1 + x_2}$,……..
  RMSE with basis 2 – **8.070515013871189**
- Plot of number of data points in training set vs RMSE with development set:



- One of the least useful features can be the **number of passengers** as taxis generally do not charge for individuals

- Error can be reduced by reducing the number of features, hence I have removed the number of passengers feature from my model