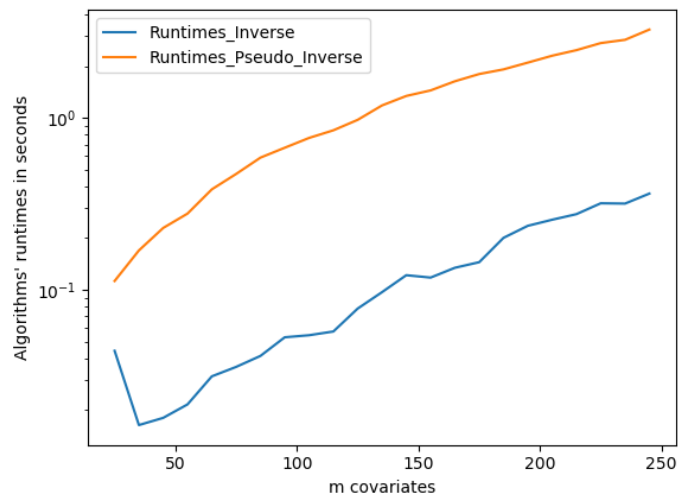
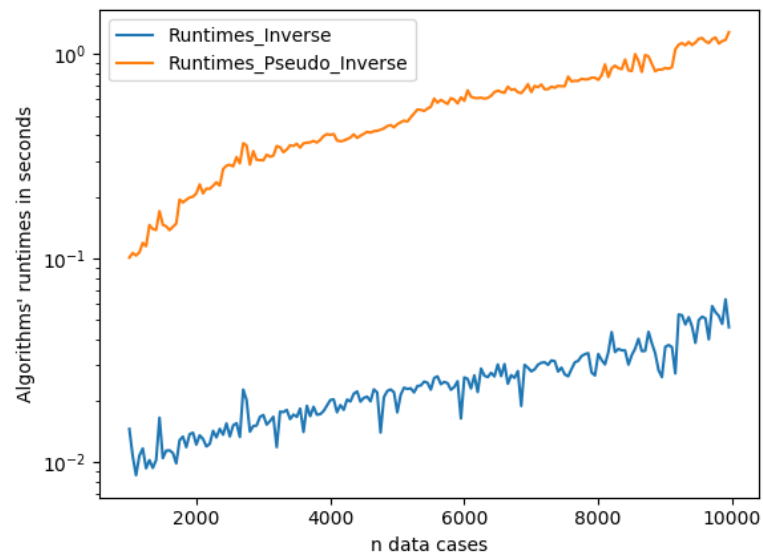


Problem 2: Ordinary Least Squares Linear Regression



1.



2.

3. Runtime _Inverse is faster than pseudo inverse as it has less run-time than pseudoinverse as it involves lot of dot product calculations and transpose which takes $O(n^2)$ times.

4. $(\mathbf{X}^T \mathbf{X})^{-1} \mathbf{X}^T \mathbf{y}$

Here X transpose is $m \times n$

X is $n \times m$

Xtranspose*X inverse is $m \times m$

Here lot of times m comes into picture and hence m has greater impact on the run time. It is also clear from graph. That small increase in m has comparatively large increase in run time.