HW2_ClassNote

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Claim: Average of 2 O.N. matrix may not be an O.N. matrix.

$$\begin{aligned} AA^T &= I \\ BB^T &= I \\ M &= \frac{(A+B)}{2} \\ MM^T &= (\frac{A+B}{2})(\frac{A^T+B^T}{2}) \\ &= \frac{1}{4}\ [\ AA^T + AB^T + BA^T + BB^T\ ] \\ &= I \end{aligned}$$

Use time. Collect data from Jan 2020 to Now.

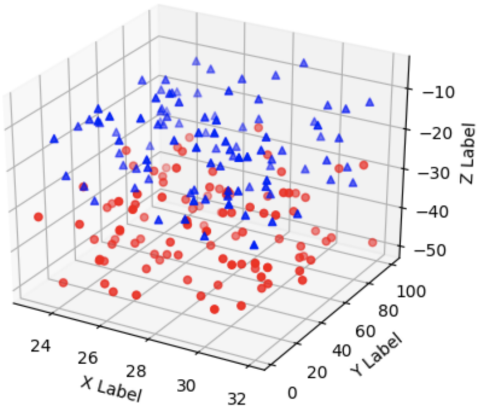
Use only stocks. Let's say pick 3 stocks out of 3000 stocks from different sectors such as Fiance, Tech, Real Estate, Health and so on. Each group takes 100 stocks.

$$\text{Make } \sigma = \begin{bmatrix} \sigma_1 \\ \sigma_2 \\ \sigma_3 \end{bmatrix}$$

Get$S_k, S_l, S_m$from the following matrix

$$M = \begin{bmatrix} \vdots & \vdots & \vdots \\ P_{sk}^2 & P_{sl}^2 & P_{sm}^2 \\ \vdots & \vdots & \vdots \end{bmatrix} = Z_{N\times 3}$$

Draw the picture as following



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