1. Second Task

For testing purposes, we chose to perform prediction and calculation without dimensionality reduction. As expected, the mean instant error (MIE) was significantly higher, being twice the minimum value obtained using other methods. As we know when dimensionality reduction is not performed, the algorithm has to work with a larger number of features, which can increase the complexity of the calculation and result in a higher MIE. This is because the algorithm may have to deal with a lot of irrelevant or redundant information, leading to a greater likelihood of overfitting and reduced accuracy of the prediction.

Methods	MIE	Learning Rate	Predictors
EigenDecomposition	0.0352	0.01	5
SVD	0.0362	0.01	5
PCA	0.0362	0.01	5
X	0.107	0.01	X

The first column indicates the technique used, the second column is the error score, the third column is the Learning Rate value that minimize the MIE, and the fourth column indicate the number of predictors that minimize the MIE.
The error score is a measure of how well the regression technique fits the data. A lower error score indicates a better fit. From the table, we can see that EigenDecomposition, SVD, and PCA Sklearn all have similar error scores, which are lower than the error score of Linear Regression. This suggests that these three techniques provide a better fit for the data than Linear Regression. It's worth noting that the number of predictors used in the analysis is the same for EigenDecomposition, SVD, and PCA Sklearn, indicating that these techniques have a similar level of complexity. Additionally, the significance level of 0.01 suggests that the results are statistically significant.
Probably due to the approximations made, the MIE result turns out to be slightly different between all the methods used.
The minimum error value was obtained using a stepsize of "1e-2" (0.01) and his value was about “0.0352”.

1.1. Final results

The suggestion obtained from the analysis of these data turns out to be: "**WntrComing**"
We can interpetate it as: "**WinterComing**"
The suggestion of the first part was: "**GoT**"

2. Conclusion:

So the final senteces was:
“Winter is coming, we know what’s coming with it. We can learn to live with the wildlings, or we can add them to the army of the dead."
-Jon Snow in Game of Thrones