There were a few omissions/clarifications/errors from the homework sheet:

1. Assume we know the v's and the σ's from the SVD.

2.

3. In writing the error in part (b), use the covariance matrix form of the error,

$$\frac{\phi^T C \phi}{\phi^T \phi}$$

The calculus gets messy, but becomes very simple to solve.

4. You might show that the data, orthogonally projected to one dimension, still has zero mean (so you do not need to redo the mean subtraction in computing the variance).

5.

6. Make the changes in boldface:

What would the following function **return** if `data` is `[1,2,3,4,5,6]`, `lags` is **1** and shift is 2?