ISYE 8803 HDDA

Exam 2
June 27th, 2021

1.

Provided is the output of the summary statistics for the Z_random (first row) and Z_nonrandom, second row:

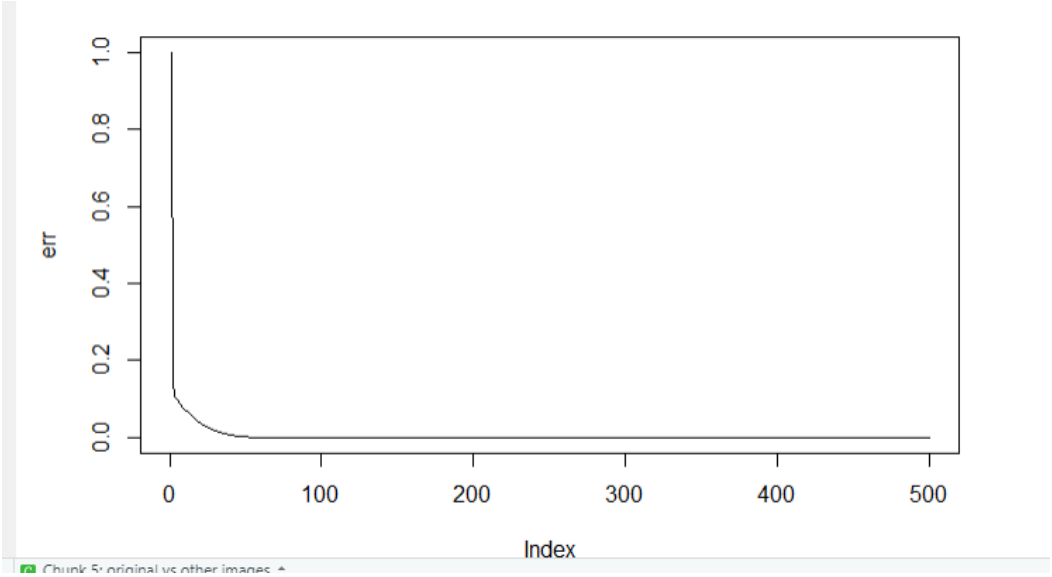
```
      Min.    1st Qu.     Median       Mean    3rd Qu.       Max.
-104.1684    -3.6555     0.4055     4.4108    11.1759  141.6940
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
      0       0       0       0       0       0
```

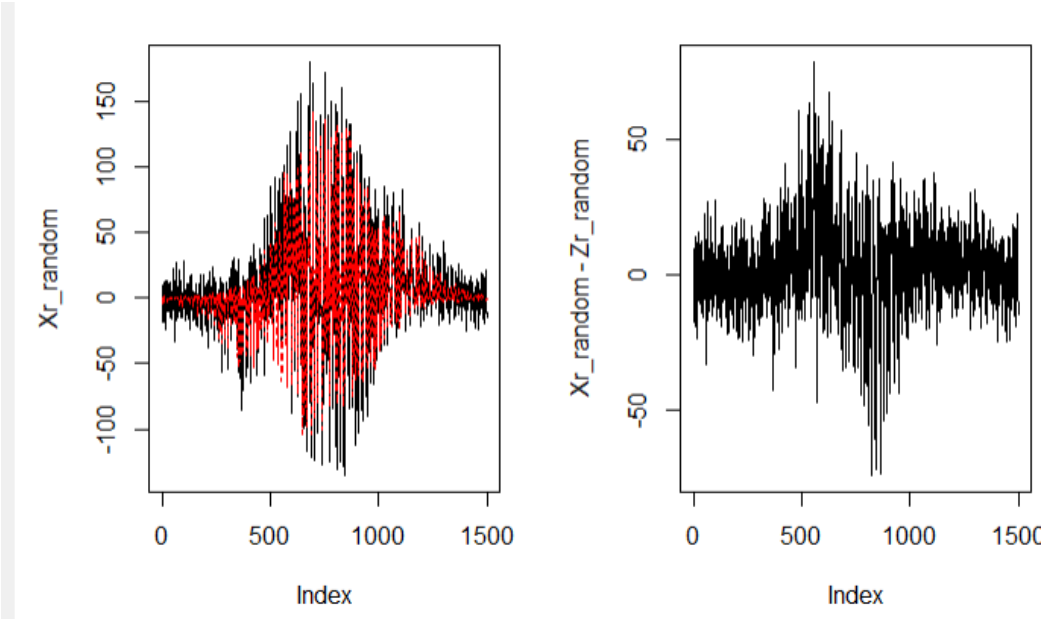
**Figure 1:** Summary Stats

We can see that the SVD Decomposition for the Nonrandom data is too close to singularity and therefore not able to represent the feature related to the variable adequately.

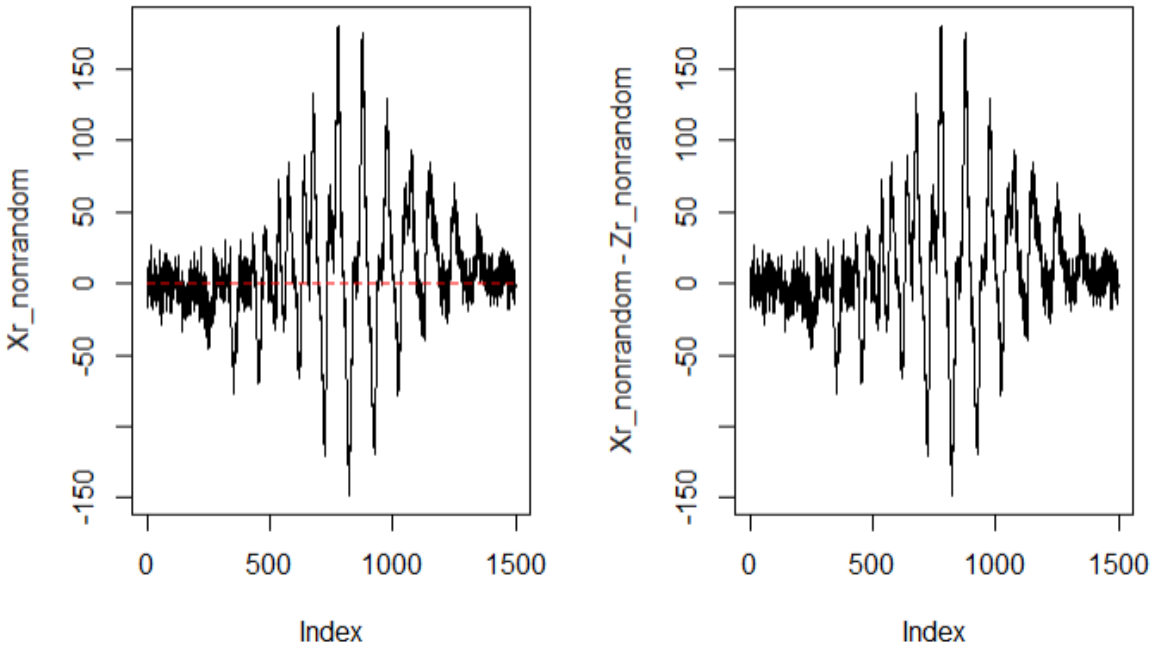
2.

We can see our recovery error is around 0.19 similar to our assignment before, and the error lines between the Z matrix and our low rank matrix X seem to have close resemblance for the RandonNoiseData matrix:



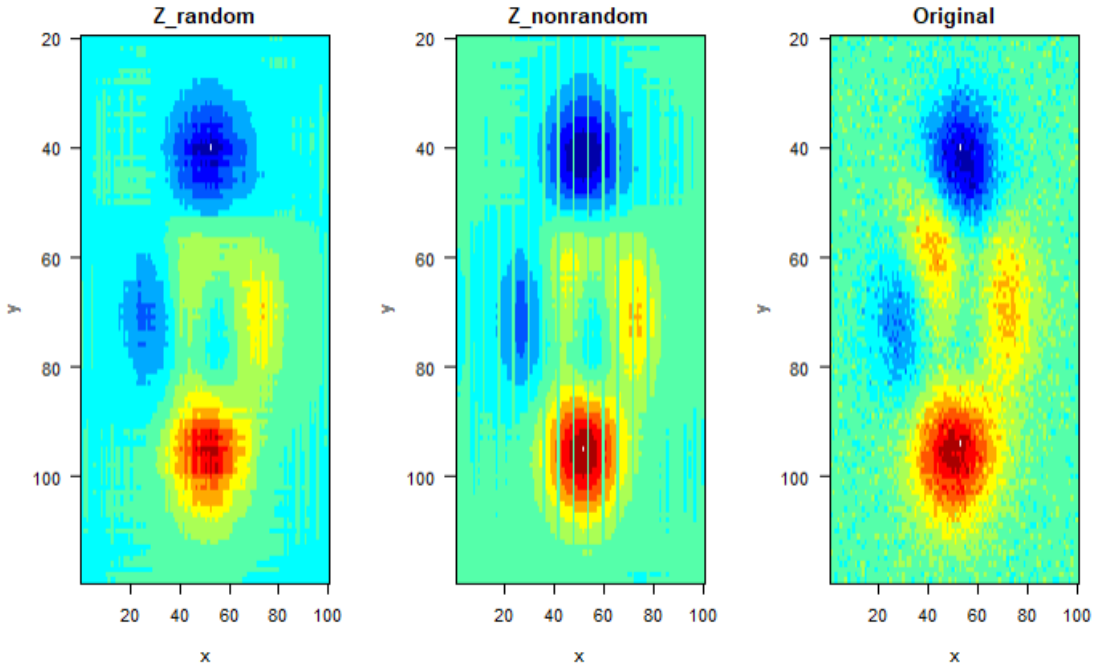

Same goes for the NonRandomMissingData matrix:




However the error rate will be 0 across the board and is not a proper representation of the original for the NonMissingData.

3.

When comparing our two images and the original, we can see that the RandomMissing data does a much better job measuring the original image when compared to the NonRandomMissing data:


Z_random
Z_nonrandom
Original
y
x
20
40
60
80
100