5)

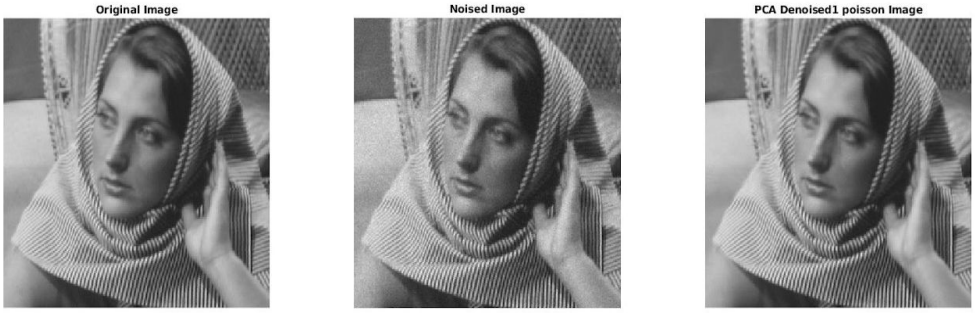
A) RMSE value=9.8144

B) RMSE value=7.7705

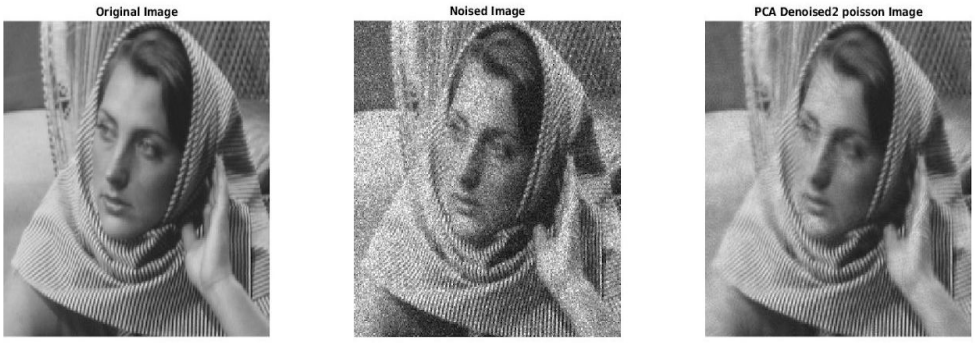
C)RMSE value=18.5562

We can see that PCA based techniques perform much better than that of Bilateral Filtering. As compared to the Bilateral Filtering, the PCA based techniques are more global and general and they use image restoration (using that the noise added is a Gaussian with known sigma, zero mean). The Bilateral Filter, on the other hand, is a technique for image enhancement only
.
Further, constructing the eigenspace using KNN ensures that the mean alpha (squared) is closer to the true value as we use similar patches only. This leads to better restoration which is evident through their corresponding rmse values.

D)
Case1: RMSE value=3.2359



Case 2: RMSE value=8.9681



As we can see that the first case is much better than the second case. The second case introduces a greater amount of noise than the first and hence the bad restoration as compared to first one.