

**Name: Muhammad Yasir Abbas**

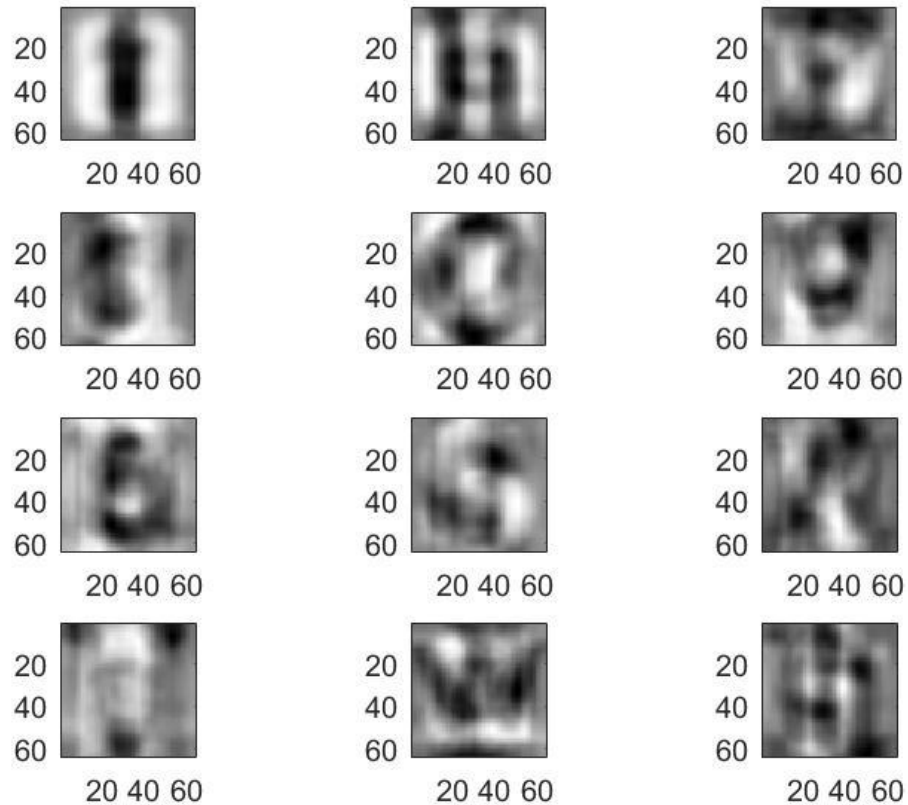
**Roll No: L16-4154**

## 1: First 12 Eigen images

The eigenvectors (also called eigen images) are calculated using  $[U \ S \ V] = \text{svd}(Z, 0)$  function where  $Z = X / \sqrt{n-1}$ .

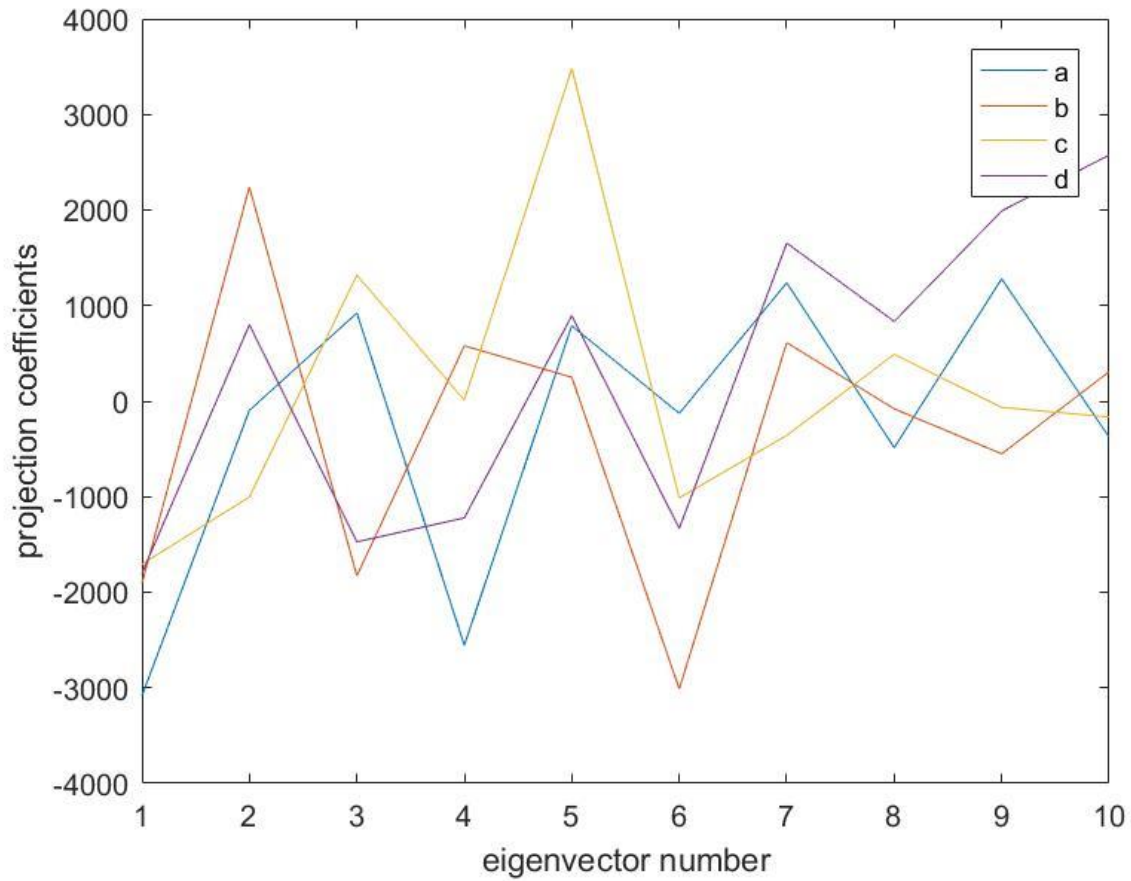
U=eigenvectors

S=eigenvalues



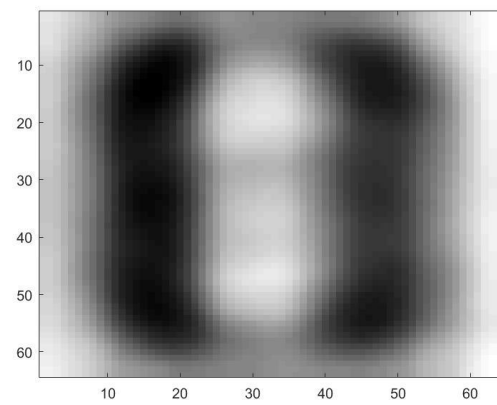
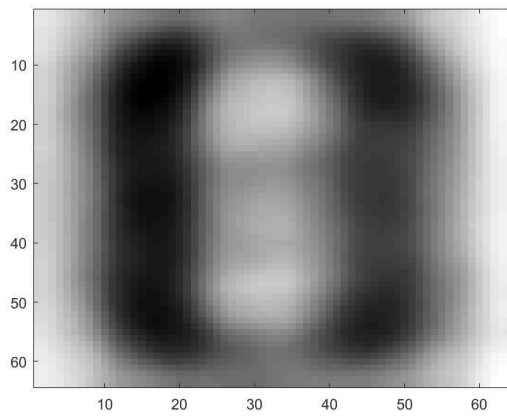
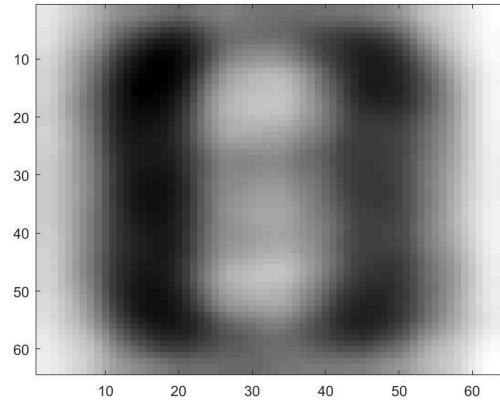
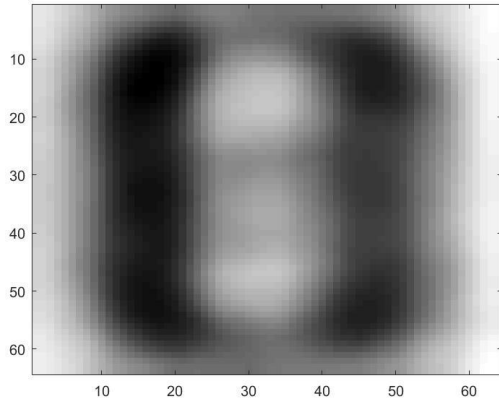
## 2: Projection Coefficient vs Eigenvector number

The projection coefficient is calculated by using formula  $Y = \text{trans}(U) * X$ . The first 10 projection coefficients of first 4 images are displayed using first four columns and first 10 rows of  $Y$ .

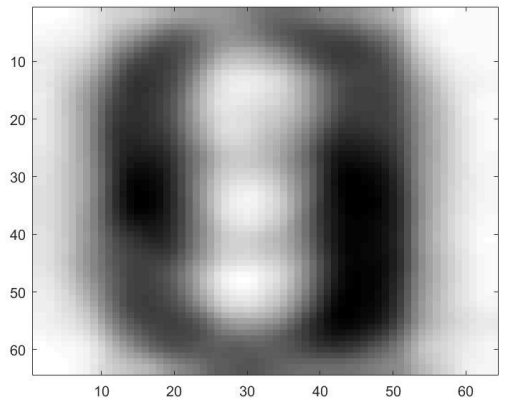
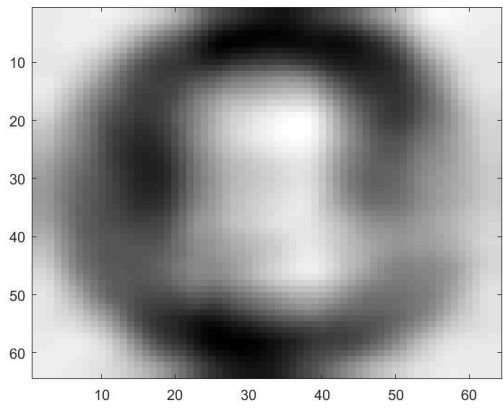
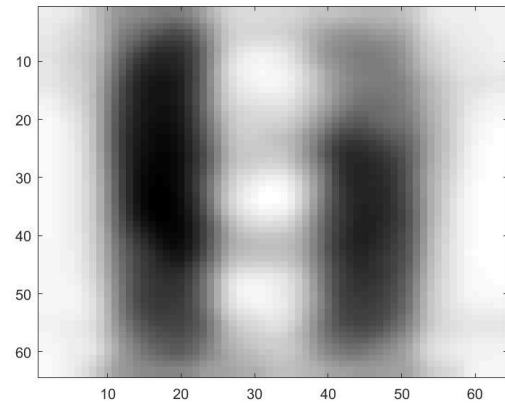
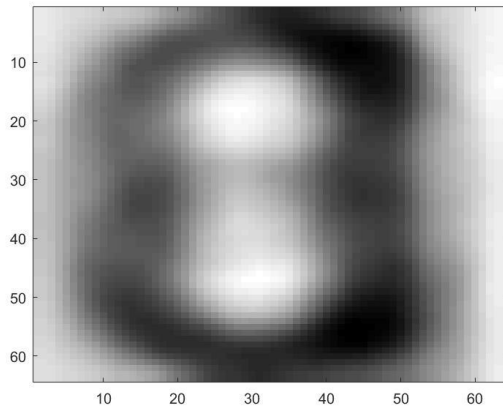


### 3: Resynthesized versions of the original image with different m

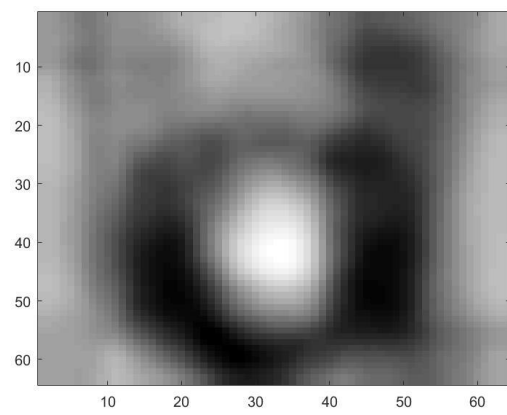
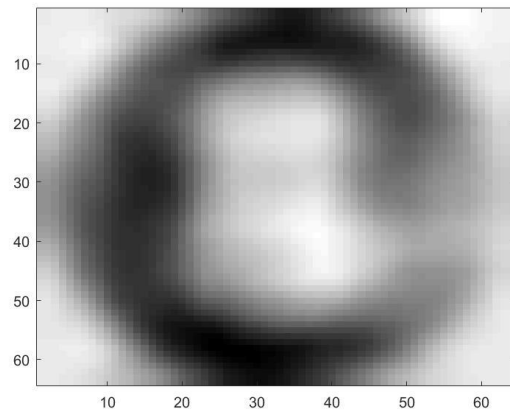
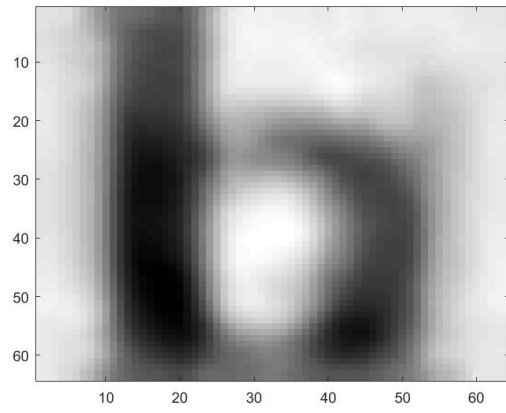
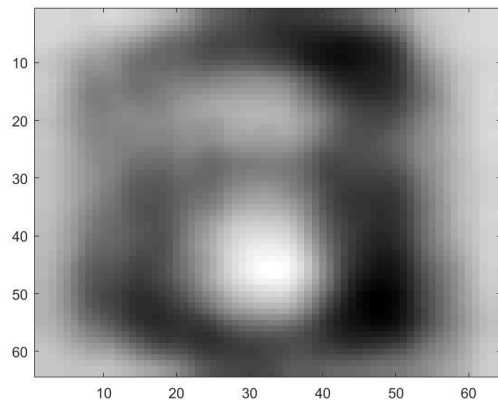
M=1:



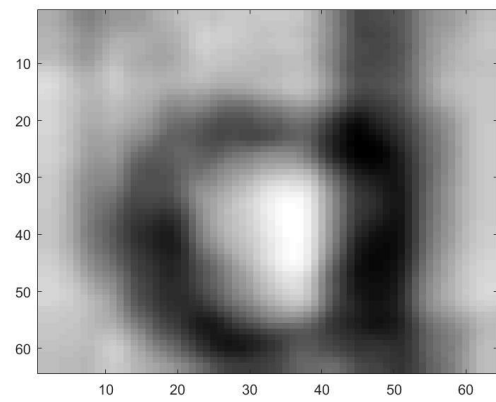
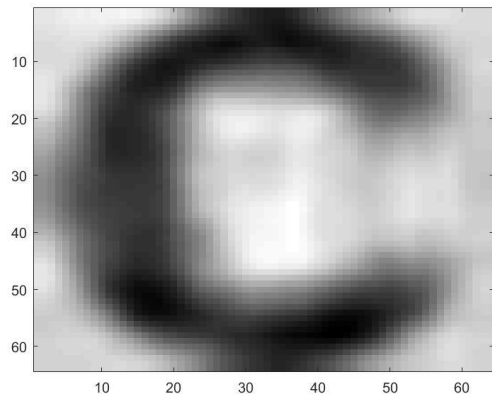
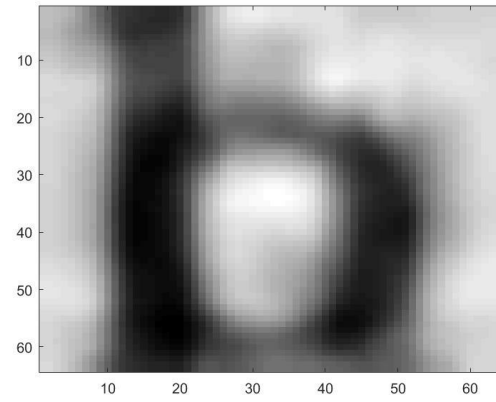
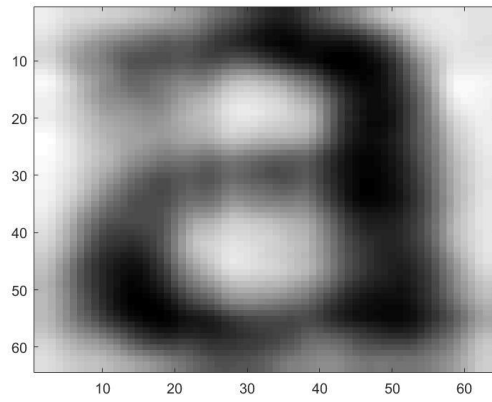
**M=5:**



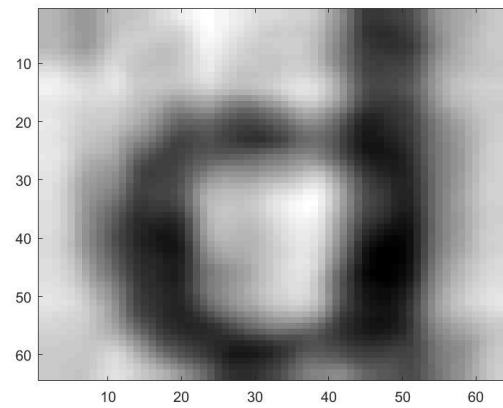
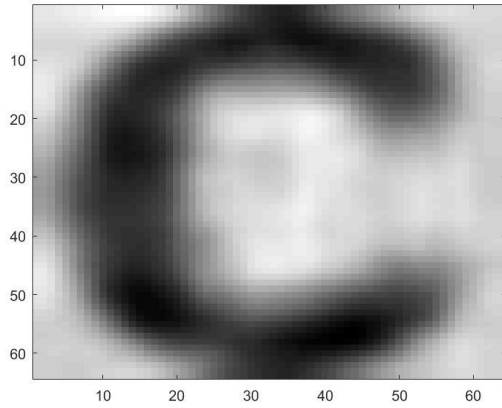
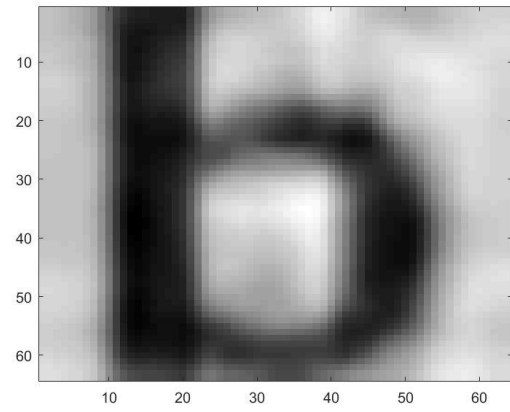
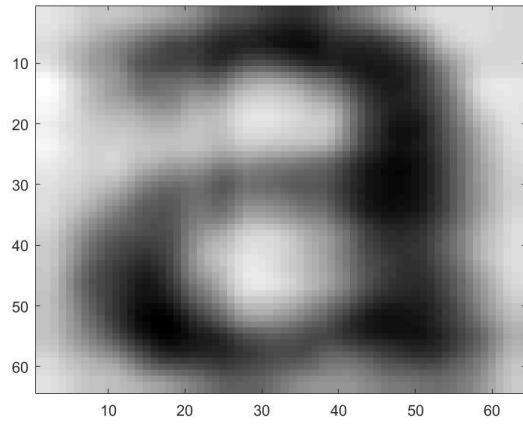
**M=10:**



**M=15:**



**M=20:**





**M=30:**

