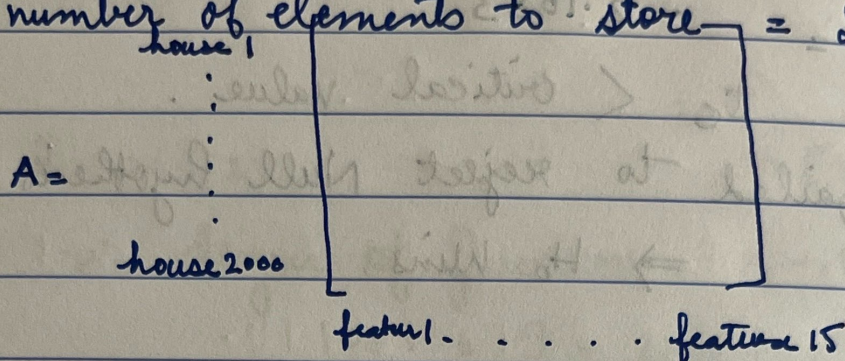


$A = (m \times n)$  matrix

$$m = 2000 \quad n = 15$$

A) Total number of elements to store =  $2000 \times 15 = 30000$

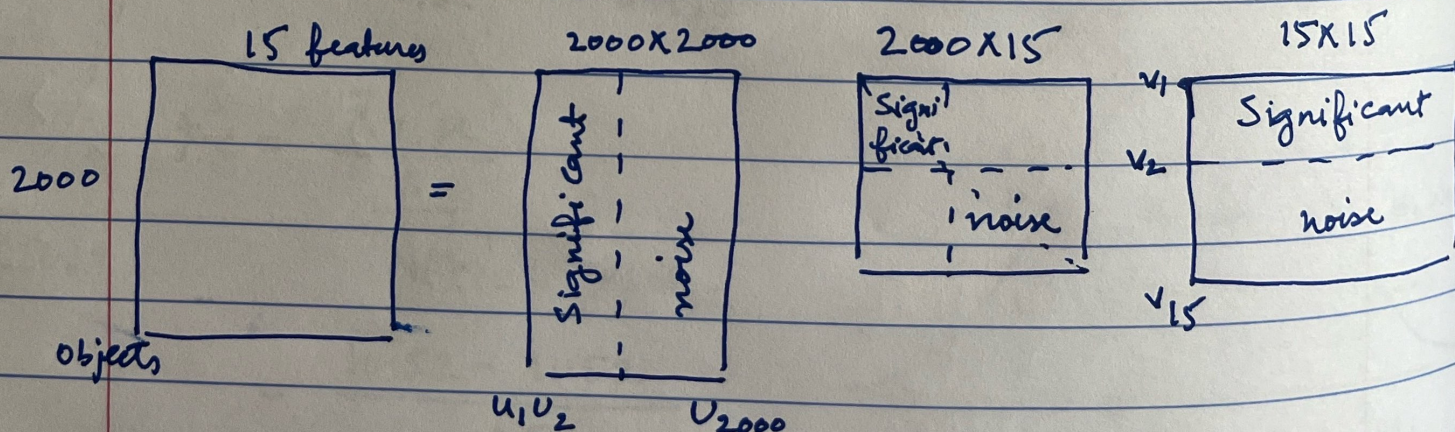


$$A = 2000 \times 15$$

B) Singular Value Decomposition (SVD)

$$A = U \cdot \Sigma \cdot V^T$$

$$\begin{array}{ccccccc} A & = & U & & \Sigma & & V^T \\ \downarrow & & \downarrow & & \downarrow & & \downarrow \\ 2000 \times 15 & & 2000 \times 2000 & + & 2000 \times 15 & + & 15 \times 15 \\ \downarrow & & & & & & \\ 30000 & & 4000000 & + & 30000 & + & 225 \\ & & = & & 4030225 & & \end{array}$$

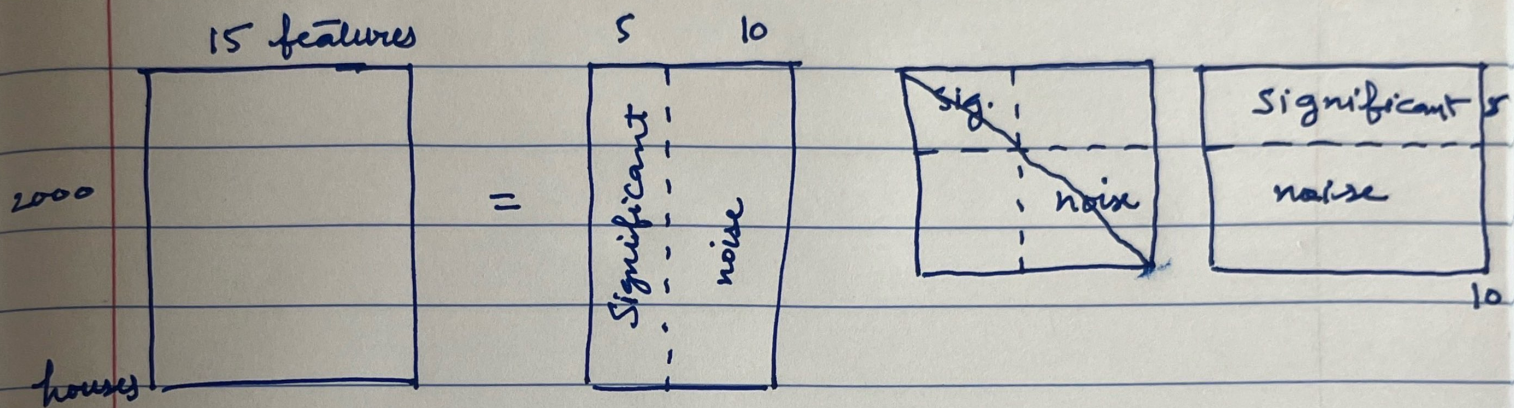


Total number of elements to store = 4030225



# c) Singular Value Decomposition (SVD) $K=5$

$$\begin{array}{ccccccc}
 A & = & U & \Sigma & V^T \\
 \downarrow & & & & \\
 2000 \times 15 & & 2000 \times 5 & 5 \times 5 & 5 \times 15 \\
 & & = 10000 + 25 + 75 = 10100
 \end{array}$$



Number of elements to store = 10100 .