

1. Compute the determinant of

$$A = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{bmatrix}.$$

2. Compute the determinant of

$$B = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 2 & 2 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 & 0 \\ 3 & 3 & 3 & 3 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 0 \\ 4 & 4 & 4 & 4 & 4 & 4 \end{bmatrix}.$$

3. Using a touch of elimination, compute the determinant of

$$C = \begin{bmatrix} 1 & 3 & 0 & 0 & 0 & 0 \\ 2 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 3 & 0 & 0 \\ 0 & 0 & 2 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 0 & 2 & 1 \end{bmatrix}.$$

4. Compute the determinant of ABC where A , B and C are the matrices above.