Assignment 3

Elements of $\mathcal{A} \in \mathbb{R}^{3\times3\times3}$ are defined in the following way:

$$\mathcal{A}(i,j,k) = i + j^2 + k^3 \text{ for } 1 \leq i,j,k \leq 3.$$

The frontal slices of $\mathcal{A}$ are :

$$\mathcal{A}(:,:,1) = \begin{pmatrix} 3 & 6 & 11 \\ 4 & 7 & 12 \\ 5 & 8 & 13 \end{pmatrix}, \ \mathcal{A}(:,:,2) = \begin{pmatrix} 10 & 13 & 18 \\ 11 & 14 & 19 \\ 12 & 15 & 20 \end{pmatrix}, \ \mathcal{A}(:,:,3) = \begin{pmatrix} 29 & 32 & 37 \\ 30 & 33 & 38 \\ 31 & 34 & 39 \end{pmatrix}$$

The three mode-j unfoldings are:

$$A_{(1)} = \begin{pmatrix} 3 & 6 & 11 & 10 & 13 & 18 & 29 & 32 & 37 \\ 4 & 7 & 12 & 11 & 14 & 19 & 30 & 33 & 38 \\ 5 & 8 & 13 & 12 & 15 & 20 & 31 & 34 & 39 \end{pmatrix}, \ A_{(3)} = \begin{pmatrix} 3 & 4 & 5 & 6 & 7 & 8 & 11 & 12 & 13 \\ 10 & 11 & 12 & 13 & 14 & 15 & 18 & 19 & 20 \\ 29 & 30 & 31 & 32 & 33 & 34 & 37 & 38 & 39 \end{pmatrix},$$

$$A_{(2)} = \begin{pmatrix} 3 & 4 & 5 & 10 & 11 & 12 & 29 & 30 & 31 \\ 6 & 7 & 8 & 13 & 14 & 15 & 32 & 33 & 34 \\ 11 & 12 & 13 & 18 & 19 & 20 & 37 & 38 & 39 \end{pmatrix}$$