Reflection Essay

This assignment introduces to the basic of python programming, numpy and opencv. It includes basic numpy array manipulations, doing PCA using numpy, reading and displaying videos and images using opencv.

**Q:** How to rearrange (a1, a2, a3, a4, …, a2n, a2n+1) to (a1, a3, a5, a7, …, a2n+1, a2, a4, …, a2n) using permutation matrix P.

**A:** Array (a1, a2, a3, a4, …, a2n, a2n+1) can be permuatated to (a1, a3, a5, a7, …, a2n+1, a2, a4, …, a2n) by multiplying with the permutation matrix (P), which is an Identity matrix of size (2n+1)x(2n+1) rearranged such that odd columns follows even columns.

(1D array \* P = permutated 1D array)

*Output:* $ python3 per\_matrix.py 2 4 5 1 6 7

Permuted array: [2. 5. 6. 4. 1. 7.]

Here in this case

**Q:** Are there multiple functions that can perform such eigenvalue decomposition?

**A:**