# Assignment four -part2

1.(20) Write a Python (with NumPy) program to solve the system of linear equations as following, print out the solution if it exists and print “no solution or infinite solution” for no solution/infinite solution:

$$3x_1 + x_2 + 4x_3 = 3$$
$$9x_1 + 4x_2 + 5x_3 = 6$$
$$9x_1 + 4x_2 + 6x_3 = 9$$

2.(30) Write a Python (with NumPy) program to center the data in each row in matrix A

$$A = \begin{bmatrix} 2 & 4 & 6 & 8 \\ 6 & 6 & 8 & 8 \end{bmatrix}$$

3.(50) Write a Python program to reduce the dimension of the data in matrix A from 2x4 to 1x4 by using the PCA method. You may apply either linalg.eig() or linalg.svd() in your program. Please output:

a. the covariance matrix

b. the eigenvalues of the covariance matrix

c. the eigenvectors of the covariance matrix

d. the first PC

e. the 1x4 reduced data matrix.

$$A = \begin{bmatrix} 2 & 4 & 6 & 8 \\ 6 & 6 & 8 & 8 \end{bmatrix}$$