LAB Assignment 4
CSL 2050

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1. N/A
2. In this Question the covariance matrix and the mean were given from which we then sample the multivariate normal distribution.
    2.1. For the first part we select 100 random points from the upper multivariate normal distribution to create X. Then we implement our own covariance function to get the covariance matrix for our new distribution along with The eigenvectors of the covariance matrix. After this we plot the eigenvectors along with the scatterplot of X.
    2.2. We then transform the X matrix with given instructions into the matrix Y. Here we Find that the covariance matrix of Y is very close to an Identity matrix. From this we can infer that this transformation results in the covariance matrix of the original data which was arbitrary becoming an Identity atrix.
    2.3. We have performed the above required tasks in order. Her we have plotted the points in the matrix P and coloured them according to their indexes so that even after transformation it does'nt affect their colours
    2.4. We then apply the required transformation to P in order to get Q. Here we Find that the Eucledian distances of both P and Q from their means is proportional and the constant of proportionality is dependant on the matric Sigma_X