Programming Assignment 2: MH Sampling

Consider a mixture of K bivariate Gaussian distributions. The mixing weights are same for all the Gaussians. The mean of the i-th Gaussian is [2i, 3i], and its covariance matrix is diagonal with value = 0.5xsqrt(i) for both dimensions. We would like to draw n samples from this GMM and plot them in 2D. We use the Metropolis-Hastings algorithm for this purpose, with a Gaussian proposal distribution with variance sigma. Write a code to generate these samples. The parameters n, K, sigma, as user inputs. Plot the samples in 2D. Generate a report showing the plots for different values of K, sigma, and n = 100. In the report, you may also show the trace plot of the first dimension.