

This file (<https://github.com/smart-stats/assignment-5-LuchaoQi/blob/master/expression.txt>) contains pre-normalized expression values for 100 genes over 10 time points. Most genes have a stable background expression level, but some special genes show increased expression over the timecourse and some show decreased expression. What can this shiny app do:

- a. Cluster the genes you upload using an algorithm of your choice. Which genes show increasing expression and which genes show decreasing expression? [E.g. K-means and hierarchical clustering are common clustering algorithms you could try.]
- b. Perform PCA(principal component analysis) on the data. Show the plot and color the points based on their cluster from part (a).
- c. Create a heatmap of the expression matrix. Order the genes by cluster, but keep the time points in numerical order.