SCOR MATLAB Code Instructions

1. DATA Analysis

- '`DATA_GENERATE.m`' generates both 2 and 3 category data which are '`DATA_num_categories_2.csv`' and '`DATA_num_categories_3.csv`'.
- In the generated data, each row represents data from a subject. The categorical variable Y is given in the first column. For a K-many possible types of outcome scenario, Y can take values from $\{0, 1, \ldots, K-1\}$. If X is d-dimensional, then the column numbers $2 : (d+1)$ denotes the X variable values. Hence a sample of size n would be given by a $n \times (d+1)$ matrix.
- The code '`SCOR.m`' computes ULBA, EHUM and SHUM based on the data.
- In '`SCOR.m`', user is provided options to set parallel preference, maximum execution time and which dataset to use.
- '`SCOR.m`' displays the solution obtained approximately every 5 seconds. User can exit the code at anytime and restore the current solution by displaying '$theta$' (the value of the coefficient vector) and '$-fun(theta)$' (the value of the objective function ULBA/EHUM/SHUM).
- Using parallel computation would be beneficial if the evaluation of the objective function is expensive.

2. General SCOR Algorithm to optimize over spherically constrained space

- A general code of SCOR is given in '`SCOR_GENERAL_OPTIMIZATION.m`' which can be used to minimize (or maximize) any desired objective function whose parameter space belongs to a spherically constrained space.
- In '`SCOR_GENERAL_OPTIMIZATION.m`', user is provided options to set own objective function, parallel preference, maximum execution time.
- It displays the solution obtained approximately every 5 seconds. User can exit the code at anytime and restore the current solution by displaying '$theta$'.

- Using parallel computation would be beneficial if the evaluation of the objective function is expensive.