Homework 2

Use `data_FIN509535_Fall2024.parquet`, a `famafrench5factors` pickle that works for your system, and `names.csv`.

Find and work with only the firms that have nonmissing observations for all months.

Questions

Do the following separately for each of the three industries `ff49` = 48, 36, and 19. Define the `permno` as a part of that industry if they were in that industry in January 2000 (the first month of our data). Look up the industries which these "Fama French 49" industry codes denote, and include that in your answers so they are more interpretable

1. Run a five-factor regression, including a constant, for the stocks in the industry. Report the which company (name) has the greatest beta for each of the five factors, and report that beta using 2 decimal places.

2. Continuing from #1, test the APT hypothesis. Report the J-statistic to 2 decimal places and the p-value to 4 decimal places. State if we reject or fail to reject at the 5% level.

3. Using the model of #1 as the unconstrained model, test the following hypotheses, report the J-statistic and p-value (2 and 4 decimal places, respectively), and state if we reject or fail to reject at the 5% level.

   (a) Zero Mkt-RF beta
   (b) Zero SMB beta
   (c) Zero HML beta
   (d) Zero RMW beta
   (e) Zero CMA beta