Assignment:

Create two portfolios for firms with and without reported R&D expenditure in year t-1. For each portfolio of firms, construct value and equally weighted portfolios and calculate their alphas with respect to the CRSP value-weighted index (and report the significance of the alphas). Include a write up of your results.

Sample selection:

- Track portfolios from 1980 through 2022.
- In the fundamental files (Compustat), apply the following filters:
    - Currency is USD
    - FIC is USA
    - Exclude SIC 6000-6999 (financials)
    - Exclude SIC 2834 (pharmaceuticals)
    - Stock exchange is 11-19
- In the security files (CRSP), apply the following filters:
    - Remove if return is NA
    - Remove if return contains letters
    - Remove if return is less than -100
    - Exclude SIC 6000-6999 (financials)
    - Exclude SIC 2834 (pharmaceuticals)

Two additional resources:

1. Helpful code snippet discussed during the meeting:

    ```
    df['var_1'] = df.groupby('LPERMNO')['var'].shift(1)
    ```

    Remember, this can be used to shift information across a dataframe, but one needs to sort the dataframe beforehand to ensure the shift is executed as anticipated. Additionally, one should think carefully about how this shift works in the context of different datasets being quarterly and monthly. Documentation on the shift function can be found below

    https://pandas.pydata.org/pandas-docs/stable/reference/api/pandas.core.groupby.DataFrameGroupBy.shift.html

    https://pandas.pydata.org/docs/reference/api/pandas.DataFrame.shift.html

2. Link to discussion of value versus equal-weighted indexes/portfolios:

    https://www.investopedia.com/articles/exchangetradedfunds/08/market-equal-weight.asp