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**FINTECH 536: ROBO-ADVISING**

**Build Lab 2d: Select assets, build Markowitz algo, report performance**

**7.0 Select the equity assets, construct the portfolio, and report performance**

**7.1 Link the new investor data to the interactive form (created with the “style sheet’)**

The new investor data set, loaded from the file is named *InputData.csv* contains demographic, financial, and behavioral attributes. These attributes are similar to those used in robo project 1. These attributes include age, current income, net worth, and willingness to take risk - among others. The attributes include both categorical and continuous variables. The attributes include, and are categorized, as follows:

*AGE*

* There are six age categories, where 1 represents age <35 and 6 represents age > 75

*EDUC*

* There are four education categories, where 1 represents no high school and 4 represents college degree.

*MARRIED*

* There are two categories to represent marital status, where 1 represents married and 2 represents unmarried.

*OCCU*

* This represents occupation category. A value of 1 represents managerial status and 4 represents unemployed.

*KIDS*

* Number of children.

*WSAVED*

* This represents the individual’s spending versus income, split into three categories. For example, 1 represents spending exceeded income.

*NWCAT*

* This represents net worth category. There are five categories, where 1 represents net worth less than the 25th percentile and 5 represents net worth more than the 90th percentile.

*INCCL*

* This represents income category. There are five categories, where 1 represents income less than $10,000 and 5 represents income more than $100,000.

*RISK*

* This represents the willingness to take risk on a scale of 1 to 4, where 1 represents the highest level of willingness to take risk.

These attributes, as in the prior robo project, are used to derive each investors’ risk tolerance.

**7.2 Link the risk tolerance model to the new investor data and the interactive input form**

Note: No code modifications, or other actions, are required from the team for this step. The new Jupyter Notebook -- *Sample-Robo Advisor.ipynb* -- is designed to “automatically” reuse the Python code, and analytical models, from robo project #1, contained in the file *finalized\_model.sav*

Once Python has linked the investor’s attribute data to the visual input form, the new Notebook’s Python code will open, and link, the risk tolerance model saved in *finalized\_model.sav*.

The risk tolerance prediction model can now be executed from the input form when its’ “Calculate Risk Tolerance” button is clicked.

Once the investor’s risk tolerance is calculated, it is displayed on the top of the interface.

**7.3 Link the S&P 500 equity asset data to the interactive input form**

The S&P 500 equity data, previously loaded from the *SP500Data.csv* file, is loaded into a dropdown menu to enable the investor to pick their preferred equities. The investor’s picks are now put into the portfolio construction process.

**7.4 Apply the Markowitz mean-variance model to construct a portfolio from the investor’s equity picks**

Once the list of selected equities is submitted, the Markowitz mean-variance model is used to structure a portfolio from the selected equities.

**7.5 Produce the graphs that depict the equity allocations and portfolio performance**

Python code, the “style sheet,” and the graphical and analytical libraries are used to produce the graphs that depict the portfolio structure and time series of aggregate portfolio performance.

**7.6 Click the URL and launch the web page with the interactive interface**

Click the URL and the interactive interface will launch in a separate browser.

Now you will be able to experiment with the robo and its’ interface – select different investor attributes, run and rerun risk tolerance calculations, and select different equity combinations, see the portfolios produced by the Markowitz model, and see the portfolio’s performance over time.

**8.0 Concluding remarks**

After completing Build Lab 2a – 2d, you will have produced a simple robo that can perform asset allocation for a hypothetical investor and provides a view of the selected portfolio and its’ historical performance over a selected time period.