INDIVIDUAL CONTRIBUTION REPORT: Flask based web application for portfolio optimization for US based equity instruments using Monte Carlo Simulations Ayan Mukherjee 1805027

Abstract: MPT or Modern Portfolio Theory also known as mean-variance analysis is a mathematical modeling technique that is deployed in constructing portfolios that can maximize the portfolio return for a given amount of risk. In this paper we optimize portfolios in accordance to the Modern Portfolio Theory for US based equity instruments using Monte Carlo Simulations. For a given Portfolio ‘P’ having ‘n’ number of stocks, with each stock ‘i’ having weight of ‘w i ’ we compute the mean and risk (standard deviation) and optimize our portfolio by optimizing the weights ‘w i ’ for the equity instruments using Monte Carlo simulation. Individual contribution and findings: My contribution helped make the team project a success. I encouraged team members to brainstorm and I provided ideas and inputs for the project. I spent a considerable amount of time guiding other team members on specific tasks of the project, concerning my area of expertise, to assist the team in reaching project goals. I demonstrated strong leadership skills throughout the project, in multiple project areas. In week two, I volunteered to be the team leader. As the team leader, I assigned each team member a portion of the assignment to accomplish, pulled together everyone’s inputs and designed the project plan. I designed the primary dataset and the final dataset for the project, the final dataset comprising of historical price data of nearly 200 equity instruments from NYSE taken over a 3 month period. I worked on the development of the ML model for this project and the backend integration using flask. Individual contribution to project report preparation: The areas concerning the python model development and flask integration along with testing results of chapters 2, 3 and 4 was contributed by me, additionally as the team leader I was entasked with the project planning and thus helped in finalizing the project plan as displayed in chapter 5. I proofed the report for errors, posted the proofed report for review and team members’ approval, and posted the finished product to the project-writeonly folder. Individual contribution for project presentation and demonstration: Demonstration of the web application using flask was carried out by me. Explained the functionality of the web application and the back end codes during presentation. Also Explained the MPT and our work in brief manner along with the future scope of work. Dr. Pradeep Kumar Mallick Ayan Mukherjee 1805027 School of Computer Engineering