**Short Answer Questions**

1. Please discuss your past academic and professional experiences and accomplishments that will help you succeed in the MFin program. Include achievements in finance, math, statistics, and computer science, as applicable. (200 words)

**Ans:**

As an ardent Actuarial Science and Statistic Science student, I have always sought opportunities to develop a solid foundation in quantitative finance.

During my undergraduate, I successfully manage risks for ten companies in a project by mimicking real-world trading in financial derivatives. I made hedge or speculate arrangements and sought arbitrage opportunities relying on their financial reports. As a result, my investments have consistently outperformed the benchmark. After fulfilling my responsibilities as a “risk manager,” out of curiosity, I continued to work as a “trader” who has $200 million in a real-time trading platform called RPM (Rotman Portfolio Manager). My portfolio design not only is based on stock price but on “humanity” (i.e., politics, breaking news, and ongoing events) and diversification. Doing so drastically increased my portfolio value, and the strategies helped me gain $42 million out of $200 million in one month. Furthermore, I attended two courses at UofT on Machine Learning and Financial Principals with “A” grades. This involved in-depth exploration of topics like Monte Carlo, Bootstrapping, supervised learning and Stratification.

As an Associate at Munich Re, I created Munich Re’s first fully automated stress test. This consisted of using industry-specific testing templates using R and VBA for data scraping. This solution saw significant efficiency for the firm and is now used by Munich Re throughout the world.

1. Tell us about your short-term and long-term professional goals. How will our MFin degree help you achieve these goals? (200 words)

**Ans:**

My long-term goal is to be a quantitative analyst, providing mathematical or statistical solutions to financial and risk management. I look forward to unleashing my knowledge of financial investment methods to keep abreast of the latest developments in this field. Wherever I end up working, whether it be a hedge fund, investment bank, or private equity firm, I intend to integrate investment strategies into my practice. My long-term goal is to return to China and establish my own quantitative “for-profit” hedge fund, expanding its operations overseas and investing in the North American markets, as they present significant growth opportunities. I will utilize my previous working experience in the hedge fund to that effect.

At MIT, I am eager to research the implications of current trends in institutional capital flows. This detailed exploration will enhance my understanding of the potential risks of passive investing and provide an edge in building trust with future investors.

The Advanced Analytics and Data Science courses and Analytics Certificate are especially exciting as they will allow me to understand shallow models and train deep neural networks in an economic context. I also hope to improve my technical skills around asset pricing and general dimension reduction techniques and ensemble methods which are critical to forming accurately priced derivatives.

At MIT, I’m eager to participate in research with brilliant faculty members. For example, Dr. Koijen concluded from a qualitative study that the minimum return guarantees change the primary function of life insurers from traditional insurance to financial engineering. This robust result shows that variable annuity insurers are exposed to interest and equity risk mismatch, and their stock returns were meager during the COVID-19 crisis. I feel honored to work with such professors and contribute to the internship for the BCF MFIN program.

Overall, the BCF MFIN program at Princeton University fits my interests and ambitions very well due to its characteristics of being practical and career-oriented. The rigorous coursework such as Financial Economics, research opportunities, and the career development program at your university will further sharpen my skills and help me reach my full potential. I feel it is a privilege to be a Princeton “tiger,” contributing my professional insights, data-analysis knowledge and skills, and conscientious nature to your program to make a difference.

As an Analyst at Barclays Capital, I developed event-driven and relative-value trading algorithms using Python. With the MFin, I will create an advanced, intuitive approach to data science problems, enabling the manipulation of alternative data sets to automate trading decisions and executions.

1. What personal qualities will enable you to contribute to the advancement of our mission? (200 words)

**Ans:**

**The mission of the MIT Sloan School of Management is to develop principled, innovative leaders who improve the world and generate ideas that advance management practice.**

I believe success as a Leader requires one to have a passion for taking the initiative, thinking outside the box and persevering in adversity.

These traits have always been integral to my personal and professional pursuits, including my recent experience as a special education teacher in San Pedro, a rural village in Costa Rica. I was required to develop creative methods to overcome the language barrier and constructed visual aids from cardboard pieces to make block numbers. In addition, the school had a dire need for wheelchairs, so I devised a cost-effective design to repurpose old bicycles into wheelchairs that we implemented as a team. My commitment to improving the world through innovation will allow me to contribute actively to MIT’s mission.

Furthermore, my extensive involvement in boxing has enabled me to develop perseverance and increased focus in facing challenges. My first loss was devastating, and I considered giving up the sport, as my goal had been to maintain a perfect record. Ultimately, increasing training intensity, dance classes and the strong support from my team allowed me to win my next match and achieve the Most Improved Fighter award by the Sydney Boxing League.

My passion for Financial Engineering stemmed from a summer course, “Financial Principles for Actuarial Science,” which has exploited my knowledge of portfolio management, enhanced my execution ability, and further assured my confidence in digging into this field.

I am proud of the challenging portfolio management assignment I complete in this course, for which I got 93/100, showcasing my superior financial risk analytical skills, decision-making, and critical thinking ability. The project aims to manage risks for ten companies by mimicking real-world trading in financial derivatives. It was tricky to start because it was my first time working as a “risk manager” for companies. Following the pricing techniques in textbooks (i.e., beta pricing, CAPM, Black-Scholes, etc.) and their annual financial reports, I made hedge arrangements for companies that profit from downstream products, such as Tiffany. Regarding companies that live upon arbitrage opportunities, I speculated on the products of material supplier companies such as mining companies. The course professor acknowledged my analysis as a valid, rigorous, and insightful report. After fulfilling my responsibilities as an “employee,” out of curiosity, I continued to work as a “trader” who has $200 million in a real-time trading platform called RPM (Rotman Portfolio Manager). To gain profit from the stock market, I first investigated the stock price trend for underlying assets (i.e., commodities, exchange rates, gold ETF, etc.) within one year, based on which I created portfolios containing call/put options, spreads, combinations, and futures. Then, I executed the designed strategies using the NASDAQ ticker symbol in my RPM account but ended up with a mediocre portfolio that balanced profit and loss. Not satisfied with the outcome, I conducted extensive research on several authoritative finance websites, such as Yahoo Finance. Throughout the investigation, I learned that economics inextricably intersects with politics, breaking news, and ongoing events from all walks of life. Therefore, my portfolio design should not only be based on “numbers” but on “humanity” and diversification. Doing so drastically increased my portfolio value, and the strategies helped me gain $42 million out of $200 million in one month. Due to the rapid increase, I was awarded the title of “Class Best Trader”. The satisfaction of designing portfolio strategies and the sense of accomplishment motivated me to take a further step in financial engineering. With advanced data analysis and coding skills (i.e., Python, R, SAS, etc.) accumulated in undergraduate study, I have confidence in succeeding in my future quantitative analyst journey.

In my junior year, due to an interest in machine learning, I joined a research team to explore the relationship between heterogeneity described by a convolutional neural network (CNN) image features and the “between-group heterogeneity” of the dataset measured by population descriptors. The first challenge our team encountered was accessing and describing between-group heterogeneity, which was unfamiliar to us. Reckoning previous statistics courses, I proposed using Cochran’s Q as a metric to measure the deviation of each group’s mean deviation from the grand. The suggestion opened up new horizons for this project, and the data analysis process went smoothly. After that, we used the average pixel intensity of each image as the population descriptor and implemented K-means clustering analysis to record the predicted accuracy of each cluster. The predicted accuracy of the tested model result proved that Cochran’s Q was a solid measure in quantifying the between-group heterogeneity. The positive project results manifested my research capabilities and placed my analytical thinking and problem-solving skills to the test.

The invaluable internship opportunities with The Wawanesa Mutual Insurance Company and Intact Financial Corporation in 2022 honed my data analysis-related skills learned from class, further expanded my mastery of Visual Basic for Applications (VBA), SAS, SQL, and prepared me for the challenging actuarial internship with Munich Reinsurance Company of Canada. On the one hand, it was arduous because I was recruited to the Reserving - IFRS 17 team, a hard-core, specialized team, and took charge of handling big data. The traditional software or method to deal with big data in our team was Excel which was time-consuming. To improve efficiency, I suggested using R to sum the loss of a particular granularity and Power BI to further visualize results. On the other hand, it was rewarding because the new “bundle” saved 80% of our time and was indeed a life-saver for our team. My enhanced ability in data science, teamwork, communication, and time management further assures my potential to succeed in your Finance program.

**Optional Questions**

How has the world you come from shaped who you are today? For example, your family, culture, community, all help to shape aspects of your identity. Please use this opportunity if you would like to share more about your background. (250 words)

Ans:

**Video Question 1**

Introduce yourself to your future classmates. Here's your chance to put a face with a name, let your personality shine through, be conversational, and be yourself. We can't wait to meet you!   
  
Videos should adhere to the following guidelines:

* No more than 1 minute (60 seconds) in length
* Single take (no editing)
* Speaking directly to the camera
* Do not include background music or subtitles

Note: While we ask you to introduce yourself to your future classmates in this video, the video will not be shared beyond the admissions committee and is for use in the application process only.

Hello everyone, my name is Sherry. I’m graduating from the University of Toronto, majoring in Actuarial Science and Statistical Science. I’m currently working at Munich Re corporate reserving team, focusing on IFRS 17 and cashflow analysis. I’m interested in applying machine learning in the finance field, and that’s why I’m here. After graduating from MIT, I would like to work as a quantitative analyst in hedge fund or private equity. After cumulating years of experience, I would like to return to China and establish my own quantitative “for-profit” hedge fund, expanding its operations overseas and investing in the North American markets, as they present significant growth opportunities. Why MIT Sloan.

Some fun facts about me – I’m a dog person and I like diving around the world. Whether it’s winter or summer, whether it’s lack or sea, I would like to explore the world under the water.