

Quantitative Risk and Finance Program (QRFP®)

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About the QRFP®:

The QRFP® is a **professional qualification in quantitative finance and risk analytics**. This program was launched in the latter half of the year 2022. We have successfully completed three batches of this course with candidates across the globe benefiting from the program.

The QRFP® curriculum has been designed to meet the requirements of contemporary roles in risk management and quantitative analytics that demand a strong understanding of quantitative concepts, hands-on modelling skills and expertise in core finance concepts.

The course syllabus has been carefully curated for the benefit of a wide audience. Following are a set of candidates who will benefit from the QRFP® qualification.

- **Candidates working in risk and quant roles:** This program helps candidates to significantly level-up skills in quant finance and risk analytics. This enables candidates to expand the job responsibilities they currently handle and also pitch themselves for leadership positions
- **Candidates looking to switch to risk and quant roles:** The program helps candidates learn core concepts in finance, quantitative analytics and Python modelling thereby enhancing their chances to switch to job roles in the domain of quantitative analytics
- **Students and fresh graduates:** The practical focus of the program helps students and freshers to connect theory with practice by learning industry applications of a variety of concepts. This equips them to gear up for joining exciting roles in the industry

The main topic heads that candidate's study in this program:

- Stochastic calculus
- Quantitative modelling – Equities, FX, volatility, Interest Rates
- Derivatives pricing
- Market risk
- Counterparty credit risk
- Credit risk
- Banking Regulations
- Machine learning fundamentals for finance
- Extensive hands-on implementation in Python.

Benefits of earning the QRFP® qualification:

QRFP® is a professional qualification in quant finance and risk analytics. Further, QRFP® is a registered trademark under trademark laws. This adds further credibility to the qualification that potential job recruiters and companies view favorably. Candidates successfully completing the program are awarded the QRFP® designation that they can use next to their name.

Earning the QRFP® qualification has its own advantages including:

- **Distinguishing from the crowd:** The qualification helps oneself distinguish from the crowd
- **Improved visibility in the job market:** Demonstrates candidates' skills in quant finance, risk management and analytics to global job recruiters
- **Networking:** Become a part of the global alumni community of QRFP® candidates and collaborate with the alumni group and explore global opportunities

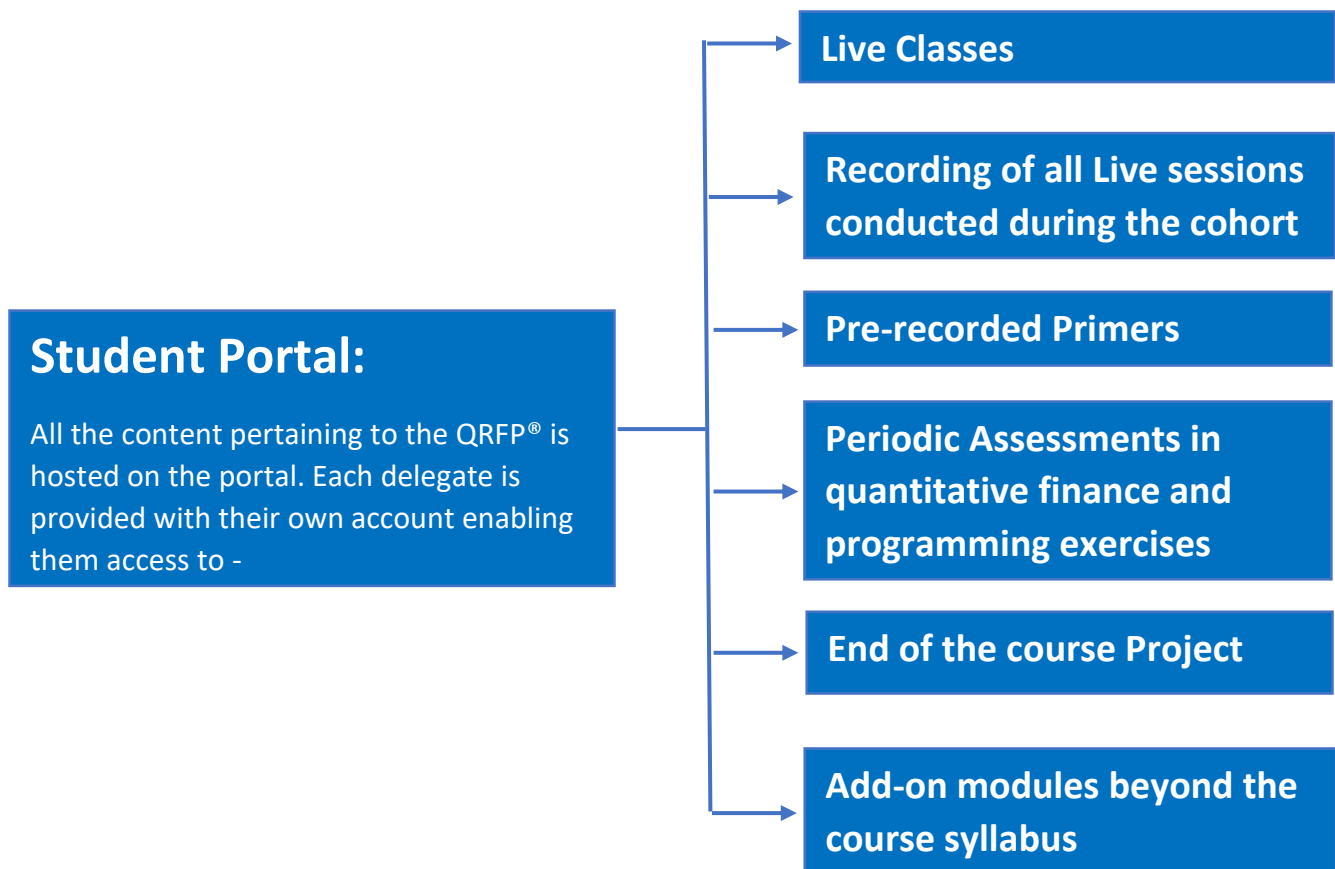
Batch Details:

- This is the fourth batch of the QRFP® program that will commence from January 2025
- LIVE and Online sessions on weekends and these get recorded
- Course duration - 5 months on weekends
- Pre-recorded primers on Maths, Python and Foundational Finance
- Regular assessments during the duration of the program
- End of the course project
- Placement assistance through our industry & client network
- Doubt solving sessions with delegates to help build full conceptual clarity

Program Delivery:

At FinQuest Institute LLP, we firmly believe in the power of interactive online learning. Our web portal enables candidates from anywhere across the globe to join the QRFP® program. The Live sessions on each weekend are conducted via an online platform. The Live sessions allow – insightful classroom discussions, sharing industry experiences and build good rapport amongst program participants.

We host a high quality and comprehensive learning portal giving 24-hour access to all lectures and study materials. Candidates can access the Student Portal from their desktop and / or their mobile handheld devices.



Faculty:

The course is conducted by faculties with a proven track-record in the financial services industry and academia and who complement each other's skill set to deliver highly effective sessions for the benefit of the program participants.



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QRFP® alumni across the Globe:

QRFP® is a global quantitative finance program. We have delegates from various major financial markets that join in to the program. We have an alumni network spread across the following countries.



Delegates profiles and academic backgrounds:

In our previous cohorts of the program, we had delegates with the following backgrounds and profiles. While most of the delegates were working professionals, we welcome students and academic researchers as well.

Delegate profiles	Academic background
Risk Manager	Banking and Finance
Investment Banking	Commerce
Banking Technology / IT	Engineering
Economist	Economics
Asset Manager	MBA graduates
Model development / validation	Pure sciences

Careers support:

We are dedicated to support the career and growth aspirations of our alumni. We provide career assistance by leveraging our industry network & clients' network to explore exciting career opportunities for our alumni. We consider the association with our alumni as being a lifelong one and are committed to giving the best support in our pursuit of excellence.

Delegates' Feedback:

The QRFP® program has immensely benefited our global candidates. Below is feedback from a few candidates from the previous batches. The feedback from other delegates can be found on the link: <https://www.finquestinstitute.com/testimonials>

1. Jason Gans, FRM, QRFP®

Risk Manager, London-based Hedge Fund

For anyone looking to improve their skills in the areas of quantitative finance and python, I would highly recommend the **Quantitative Risk and Finance Program (QRFP®)** program. The course provided a nice balance of theory and practical skills- which I have already been able to apply at my place of work.

The weekly, live lectures were always engaging and provided an excellent forum for discussion. Prof. Ameya and Prof Date are both extremely well-versed subject-matter experts with an ability to explain complex topics in an approachable manner. The professors were professional, supportive, and very willing to answer any questions that may arise.

Those who complete the QRFP® program will experience a significant levelling-up of their finance and coding skills. Whether you are new to finance or an experienced professional- I have no doubt that you will find this program extremely beneficial for your future career.

2. Saurabh Singh, QRFP®

India Head, Analytics and Modelling, Global Asset Management Company

I recently undertook the FinQuest Institute's **Quantitative Risk and Finance Program (QRFP®)**, with Ameya and Prof. Date. I found the course very thorough and well organized with strong risk content. The course was very comprehensive and covered key topics like Stochastic Process, Interest Rate Modelling and other Core Credit Risk Contents including CVA and Regulation.

Ameya is very knowledgeable and has strong hold on concepts which helps in easy delivery of course content. He blends the program topics with his professional experience in various consulting assignments which helps participants relate problems to real world scenarios. *I would strongly recommend the course to anyone who is seeking to get an in-depth understanding in the field of Quant Finance.*

I would also acknowledge Ameya for being an extremely humble person who will try everything possible to make sure participants are benefited. It was great interacting with Ameya and the team.

3. Haithem Hosni, QRFP®

BSc. (Hons) - Financial Mathematics, Brunel University London, UK

I recently completed the **Quantitative Risk and Finance Program**, and I can confidently say it was one of the best learning experiences I've had. The course was meticulously structured, with each module building on the previous one, creating a seamless and comprehensive learning journey.

The content quality was top-notch, with in-depth materials that not only covered the fundamentals but also dove into advanced concepts. What truly stood out was the practical approach; real-world examples, and hands-on Python exercises made the content come alive and ensured I could immediately apply what I learned.

The Professor's deep expertise and unique teaching style were pivotal in making this course truly exceptional. Professor Abhyankar and Professor Date demonstrated a remarkable ability to break down complex concepts into simple, digestible pieces, ensuring that even the most challenging topics were easy to grasp. Their engaging approach, combined with a genuine passion for teaching, made each lesson enjoyable and highly informative.

Moreover, the resources and additional reading materials were thoughtfully curated, providing an opportunity to explore topics further and gain a deeper understanding. The community

aspect was also a highlight, with active discussion forums and networking opportunities with fellow participants, which enriched the overall experience.








Overall, I highly recommend the course, it exceeded my expectations and provided incredible value for the time and investment.

4. Rahul Verma, MBA (Finance), QRFP®

Assistant Vice President, Quants Team with a Global Investment Bank

I have completed FinQuest Institute's **Quantitative Risk and Finance Program (QRFP®)** course under the guidance of Mr. Ameya Abhyankar, CFA, CQF and Dr Paresh Date. Thank you to both the faculty members for perfectly designing and executing the course which has enhanced my current skills and knowledge.

Key highlights about the course

-  Perfect blend of theory and practical implementation.
-  Hands-on practice with Python exercises and code debugging.
-  Helpful primers relating to Python and Statistics which helps in refreshing and building the foundational knowledge required for the course.
-  Expertise faculty with practical knowledge and quick turnaround with respect to Student's queries.
-  Course is spread out across weekends which enables the chance to absorb and practice the course contents at your own pace.
-  Difficult Concepts such as Itô's Calculus, Options pricing, etc. are explained in the simplest manner.
-  The course covers Market Risk, Credit Risk and Quantitative Finance concepts in depth and focuses on real world scenarios.

I would personally recommend this course for anyone who wants to understand different quantitative finance/ risk concepts and implementation of these concepts in the real world. This course will not only enhance your current knowledge base but also make you ready for difficult interview questions and prepare you for future opportunities.

5. Kunal Deshpande, FRM, QRFP®

Vice President, Counterparty Risk with a Global Bank

I had the pleasure of taking the FinQuest Institute's **Quantitative Risk and Finance Program (QRFP®)**, with Ameya and Prof. Date. The course was very well organized and had a good balance of theory and practice, with the right amount of depth and breadth of topics being covered.

The part I especially liked was the treatment of Stochastic Calculus in the course, which is a tricky topic, Ameya interspersed the theory very well with implementation to ease the understanding.

Being a risk management practitioner, this course has had an immediate impact on the way I approach risk management and analyze products.

Course syllabus : Primer + Main Course + Add-on modules

Primers (Pre-recorded):

Primer	Topics Covered	Brief Description
Maths Primer	Functions, Limits, Taylor Series, Calculus	<ul style="list-style-type: none"> • Types of functions and their key properties • Limits & continuity • Taylor Series expansions • Integration • Differential Equations
	Probability Theory & Distributions	<ul style="list-style-type: none"> • Probability Theory and relevance to finance • Discrete and Continuous probability distributions • Popular distributions used in finance • Central Limit Theorem
	Linear Algebra	<ul style="list-style-type: none"> • Introduction to vectors and properties • Matrices • Matrix operations – multiplication, inverse etc.
Python Primer	Basics of Python programming	<ul style="list-style-type: none"> • Understand basic building blocks in Python including data types, arrays, conditional statements, looping, functions etc. • Introduction to key libraries used for finance • Simple hands-on exercises to give candidates an idea as to how various libraries and features are used in practice and relate them with the practical scenario observed in the industry
Finance Primer	Foundations of Finance and Capital Markets	<ul style="list-style-type: none"> • Ecosystem of Capital Markets • Introduction to Cash segment and Derivatives segment • Basics of regulations • Time Value of Money in finance • NPV and IRR concepts • Basics of derivatives • Forward contracts and the pricing of the same

Primers help candidates build a strong foundation in Maths, Python programming and Basics of Finance & Capital Markets. A good grasp of the contents from the Primer helps candidates to build robust groundwork which comes useful during the main course.

Further, candidates are expected to practice the sample examples given in these primers. This helps candidates get full clarity on the concepts discussed in the primers.

Main Course (Live Sessions):

Module	Topic	Description
1	Introduction to Risk Management	<ul style="list-style-type: none"> • Risk management in banks and financial institutions • Discuss the growing importance of Risk in decision making • Risk function roles and responsibilities • Board approves Enterprise-wide risk policies and procedures • Risk reporting infrastructure in banks
	Bond Mathematics	<ul style="list-style-type: none"> • Bonds and features • Bond Pricing and credit spreads • Risk measurement of fixed income portfolios • Understanding rates – Spot rates, Forward rates • Numerical methods to solve for roots of a polynomial • Bootstrapping model for deriving spot rates from market yields • Forward rates • Risk sensitivities - Duration, Convexity, PV01 • Callable and Puttable bonds & properties • Duration gap management for ALM <p>Hands-on exercise:</p> <ol style="list-style-type: none"> a. Bond Pricing model b. Numerical techniques to solve for yields from traded prices c. Bond duration calculator
2	Futures contracts	<ul style="list-style-type: none"> • Properties of Futures contracts • Cash and Carry ; Reverse Cash and Carry arbitrage • Margining in Futures market • Convenience yield, cross hedging, hedge ratio etc. • Concept of Basis Risk, CTD • Risk management using futures • Numerical examples on above concepts for clarity <p>Note: Introduction to derivatives; Pricing and applications of Forward contracts is covered in the <i>Foundation Finance primers</i></p>
	Options Contracts	<ul style="list-style-type: none"> • Understanding Options and its mechanics, • Put-Call parity and no arbitrage • Arbitrage trading if Put Call parity is violated • Review of popular Options Trading Strategies

3	Discrete Time model - Binomial Model	<ul style="list-style-type: none"> • Binomial option pricing model • Understand key concepts like Risk Neutrality, No-Arbitrage, Girsanov's theorem • Matching the size of up and down move with volatility - model calibration idea <p>Hands-on exercise:</p> <p>a. Binomial option pricing model</p>
4	Stochastic Processes - 1	<ul style="list-style-type: none"> • Basics of quantitative finance • Concept of forward and backward equations to understand process diffusion • Techniques to transform and solve a higher order partial differential equation • Building blocks of stochastic differential equations
	Stochastic Processes - 2	<ul style="list-style-type: none"> • Understand a Wiener Process • Geometric Brownian motion • Ito's Lemma and deriving its various forms • Asset price diffusion process • Meaning of correlated processes • Relevance of matrix decomposition for correlated assets
	Stochastic Processes - 3	<ul style="list-style-type: none"> • Recap of a key concepts from probability theory • Introduction to Martingales • Meaning of the Ito's integral • Equivalence between SDE representation and Martingales
5	Continuous Time models- Black Scholes Model	<ul style="list-style-type: none"> • Understand continuous time system • Black Scholes Merton (BSM) option pricing model • Derive the Black Scholes PDE • Final conditions & Boundary conditions for option prices • BSM model calibration methodology • Enhancements to the conventional BSM framework • BSM model applied to a variety of underlying assets • Analysis of options Greeks appearing in the BSM PDE
6	Numerical Methods	<ul style="list-style-type: none"> • Understanding the key types of numerical techniques frequently used in the industry • Monte Carlo simulation • Finite Difference scheme • Handling American optionality <p>Hands-on exercise:</p> <p>a. Monte Carlo engine for pricing Options</p> <p>b. Finite Difference approach for Option pricing</p>

7	Revisiting Black Scholes Merton via the Martingale approach	<ul style="list-style-type: none"> Idea of Equivalent Martingale Measures (EMM) Demonstration of risk premium adjustments as we move between the risk neutral and real worlds Martingale approach to derive the BSM model
8	Modern Portfolio theory, Portfolio optimization, and active portfolio allocation	<ul style="list-style-type: none"> Markowitz modern portfolio theory including ideas of – efficient frontier, tangency portfolio, Sharpe ratio Investment Policy Statement for portfolio management Key types of investors and popular investment products frequently used in asset management Usage of matrix algebra for solving portfolio problems Portfolio Optimization techniques Active portfolio allocation via the Black-Litterman model
<p style="text-align: center;">Mid-course 1 weekend break</p> <p>There is a 1 weekend break after 10 weeks of Live classes. This 1 weekend break gives candidates the opportunity to:</p> <ul style="list-style-type: none"> revise concepts, catch up on the practice hands-on exercises, complete any pending problems sheets and of course, relax and unwind! 		
9	Market Risk Management	<p>Value at Risk (VaR)</p> <ul style="list-style-type: none"> Understand concept of Value at Risk Various approaches to measure VaR of a portfolio – Variance-Covariance VaR; Historical Simulation; Monte Carlo VaR Stress VaR of portfolios Back-testing approaches for VaR models <i>Expected Shortfall</i> as a coherent risk measure <p>Option Greeks</p> <ul style="list-style-type: none"> Understanding the relevance of option greeks to risk management Discussing greeks frequently used for a vanilla options <p>Hands-on exercise:</p> <ol style="list-style-type: none"> Developing VaR model using Python Estimating greeks using Python
10	Volatility Smile analysis	<ul style="list-style-type: none"> Understanding the concept of volatility smile Volatility smile in Equity and FX markets – mathematically relating the smile with probability distribution Extraction of Implied vols smile from traded options Discussion of the Vanna Volga model for options
	Volatility models	<ul style="list-style-type: none"> Review of different types of volatility measures <p>Introduction to Local volatility models</p> <ul style="list-style-type: none"> Understand the need for local volatility models Study the link between implied volatility and local volatility Diffusion equation to arrive at formulation of local volatility

		<p>Parametric volatility models:</p> <ul style="list-style-type: none"> • Auto-regressive Moving Average (ARMA) • Exponentially Weighted Moving Average (EWMA) • Generalized Auto regressive Heteroskedasticity (GARCH) • Concept of volatility clustering and how to counter it <p>Hands-on exercise:</p> <ul style="list-style-type: none"> • Fitting a GARCH model using Python
11	Overview of Regulatory Risk and Capital	<ul style="list-style-type: none"> • Get an overview of the regulatory and risk capital framework • Introduction to Fundamental Review of the Trading Book (FRTB) guideline – Standardized Approach and Internal Models Approach • Review of Basel III capital charge framework • CVA capital charge • Off-balance sheet exposure for banks • Regulatory reporting by banks
12	Interest Rate Derivatives & Interest Rate modelling	<ul style="list-style-type: none"> • Introduction to interest rate derivatives • Interest rates caps and Black's model • Forward rate model • Forward rate volatilities • Interest rate swaps • Swap pricing • Swaptions and modelling of forward swap rates • Short rate models – Vasicek model and bond pricing PDE • Bond options; Cox Ingersoll Ross (CIR) model • Hull White (HW) trinomial trees <p>Hands-on exercise:</p> <p>a. Model for pricing Interest Rate Caps and Floors</p>
13	Credit Risk & Modelling	<ul style="list-style-type: none"> • Decision making models vis-à-vis regulatory capital models • Probability of Default (PD), Loss Given Default (LGD), Exposure at Default (EAD) • Credit Ratings and Master Ratings Scale • Stress Testing • Model validation in practice
14	Economic Capital	<ul style="list-style-type: none"> • Concept of Economic Capital • Expected Loss (EL) & Unexpected Loss (UL) • Difference between Economic Capital and Regulatory Capital
15	Credit Derivatives	<ul style="list-style-type: none"> • Structured Models – Merton's model and its variations for credit risk management • Conditional and unconditional default probabilities • Overview of Intensity Models / Hazard Rate model for credit risk • Valuation & Trading of Credit Default Swaps (CDS) • Using market data to derive the PD

		<ul style="list-style-type: none"> Understand Credit Transfer Mechanisms (First to default option, CDS, CLN etc.) <p>Hands-on exercise:</p> <ol style="list-style-type: none"> Model for estimating survival probabilities from CDS market data Model for CDS valuation
16	Counterparty Credit risk and exposure monitoring	<ul style="list-style-type: none"> Understand the concept of credit risk in portfolios Understanding counterparty risk Popular techniques to mitigate counterparty risk Role of credit ratings and a brief on the credit rating process Understand the real time Limits monitoring done by banks Exposure monitoring and analysis by banks
	Central Counterparties (CCPs)	<ul style="list-style-type: none"> Relevance of Central Counterparties to manage counterparty risk Mechanism adopted by CCPs to guarantee clearing & settlement Clearing member commitments & handling of member defaults
17	Credit Value Adjustment (CVA), Debt Value Adjustment (DVA); Wrong Way risk	<ul style="list-style-type: none"> Credit Value Adjustment (CVA) modelling Debt Value Adjustment (DVA) modelling Concept of bilateral CVA Wrong way risk models
18	Fundamentals of Data Science and Machine Learning for Finance	<ul style="list-style-type: none"> Data science and its relevance to risk management Understanding the two main categories which we classify models broadly into: <i>Regression</i> and <i>Classification</i> Walkthrough of model categories in ML and data analytics: supervisory, un-supervisory, dimensionality reduction etc. Introducing ideas like mean-variance bias/tradeoff; global/local minima point, Regularization techniques, idea of feature selection Review of popular techniques like: random forests, kNN, logistic regression, decision trees etc. Un-supervised learning techniques including PCA, hierarchical clustering and k-means clustering Concept of multilayer perceptron, feedforward mechanism, ANN nodal weights optimization by backward induction, concept of non-linear transformation in “hidden layers” Overview of certain techniques in ANN like LSTM, recurrent neural networks etc. Natural Language Processing with a focus on news sentiment Introduction to Generative AI (Gen AI) <p>Hands-on exercises:</p> <ol style="list-style-type: none"> News sentiment analytics Machine learning for asset price estimation Unsupervised learning models for stock analysis

Add-on Modules (Pre-recorded):

Certain topics beyond the course syllabus are included as Add-on modules. The Add-on topics are over and above the course syllabus and pre-recorded for candidates to learn. The Add-on modules include a wide array of topics which include quantitative topics, qualitative topics, Python implementations, regulatory updates etc. Further, please note that the list of add-on modules in table below is only representative. We strive to add modules on more topics than the ones listed below for the benefit of the candidates.

	Representative list of topics
Add-on modules	<ul style="list-style-type: none"> • Time series analysis • Operational risk management • Risk governance • Quantitative methods • Non-parametric hypothesis testing • Parallel computing • Trading strategies with Python

Assessments:

During the Course assignments:

There will be assignments given to candidates at regular intervals of time, so that they can apply and master the concepts and techniques discussed during the Live sessions. Such periodic assignments help candidates develop conceptual clarity and build confidence.

End of the Course Project:

There will be an end-of-the-course project given to candidates. This project is a culmination of concepts discussed during the program. The project work gives candidates the opportunity to apply multiple concepts studied during the program. Through this project, candidates can showcase their expertise in quant finance and risk to clients and potential job recruiters

Contact us to know more about the program:

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Thank you!