



Capstone Winter Projects

2024

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Project 1 - Strategic Turnaround Analysis of a Company

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Project Overview

This project delves into the journey of a company's strategic turnaround, examining the challenges encountered, the strategies employed to overcome them, and the results achieved. It emphasizes **financial analysis** and **strategy case analysis**, equipping students with practical, real-world skills in these areas. Participants will analyze a real-world case, conducting comprehensive financial evaluations of the company's performance pre and post-turnaround, dissecting critical strategic decisions, and deriving key insights. The project concludes with a professional presentation showcasing the findings and the financial analysis.

Objectives

1. Equip students with hands-on experience in financial analysis and strategic evaluation.
 2. To identify and analyze key financial and operational challenges faced by companies.
 3. Showcase the strategic and financial outcomes of turnaround initiatives.
 4. Develop skills in creating professional reports and delivering effective presentations.
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Project Procedure

The project involves the following steps:

Step 1: Company Selection

- Select a company with a notable turnaround story (examples: Bajaj Finance, Tata Motors, Netflix, LEGO or any other company of choice).
 - Conduct initial research on (not limited to):
 - Company history and challenges faced.
 - Industry context and market position at the time.
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Step 2: Financial Analysis

Conduct a **detailed financial analysis** of the company's performance **before and after** the turnaround.

Analysis Scope:

1. Pre-Turnaround Financial Health:

- Evaluate the company's financial statements (Balance Sheet, P&L, and Cash Flow).
- Conduct **ratio analysis** (liquidity, profitability, efficiency, leverage, etc.).
- Benchmark performance against industry peers and historical trends.
- Identify key financial "red flags" (e.g., revenue decline, rising debt, shrinking margins).

2. Post-Turnaround Financial Transformation:

- Perform similar financial analysis for the post-turnaround period.
 - Compare pre- and post-turnaround financial metrics.
 - Highlight improvements in key financial indicators (e.g., revenue growth, debt reduction, profitability).
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Step 3: Strategic Analysis

Analyze the company's strategic interventions and decisions during the turnaround process.

Analysis Scope:

- Identify major strategic initiatives (e.g., leadership changes, cost optimization, market repositioning).
 - Assess the relation between these strategies and financial outcomes.
 - Evaluate the role of external factors (e.g., industry trends, market dynamics).
 - Highlight key success factors (e.g., leadership, innovation, organizational resilience).
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Step 4: Presentation

Prepare a **professional presentation** summarizing findings and insights.

Components:

- Executive summary of the project.
 - Key financial trends and metrics (data-centric and visualized).
 - Strategic initiatives and their outcomes.
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Deliverables

A document containing Financial and Strategic Analysis:

- A detailed comparison of pre-and post-turnaround financial performance with key metrics, trends, and visualizations showing improvements.
- A summary of the company background, the identified problem, strategic initiatives, and their impact on the company's financial recovery.

Final Presentation:

- Professionally designed slides (**10-12 pages**) summarizing findings, supported by visual **storytelling**.
 - A 15-minute presentation with clear, impactful visuals and storytelling followed by 5 minute Q&A.
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Evaluation Criteria

- **Depth of Financial Analysis:** Quality and accuracy of pre- and post-turnaround financial assessments.
 - **Critical Thinking:** Ability to connect financial and strategic outcomes.
 - **Strategic Understanding:** Clarity and relevance of insights into strategic decisions.
 - **Presentation Quality:** Visual storytelling, data interpretation, and professionalism.
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Why This Project Adds Value?

- **Resume Highlight:** Showcases practical skills in financial analysis and strategy.
- **Interdisciplinary Relevance:** Combines finance, business strategy, and data visualization for a comprehensive learning experience.
- **Real-World Insight:** Provides an opportunity to study a real-world business case in depth.
- **Presentation Experience:** Builds skills in professional communication and storytelling.

Some Useful Resources:

- (1) <https://corporatefinanceinstitute.com/course/learn-to-read-financial-statements-free-course/>
- (2) <https://zerodha.com/varsity/module/fundamental-analysis/>
- (3) <https://www.investopedia.com/terms/r/ratioanalysis.asp>
- (4) <https://www.pwc.com/jm/en/research-publications/pdf/basic-understanding-of-a-companys-financials.pdf>
- (5) <https://corporatefinanceinstitute.com/assets/CFI-Financial-Ratios-Cheat-Sheet-eBook.pdf>

- (6) <https://www.youtube.com/@365FinancialAnalystTutorials/playlists>
- (7) Refer to a casebook on:
https://www.linkedin.com/posts/consult-club-iim-calcutta_iim-calcutta-casebook-2023-24-activity-7106291181445115904-HYOP/

Project 2 - Algorithmic Trading Strategy Development

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Project Overview

Algorithmic trading, a critical innovation in modern financial markets, leverages computational techniques and data-driven strategies to optimize trading decisions. This project provides participants with the opportunity to design, implement, and evaluate algorithmic trading strategies. The goal is to blend technical analysis, statistical modelling, and automation to create robust and profitable trading systems while simulating real-world markets.

Objectives

1. Understand the fundamental principles of algorithmic trading, including its relevance, applications, and limitations in real-world financial markets.
 2. Design and implement trading strategies using technical indicators and statistical models to optimize decision-making in varying market conditions.
 3. Build an end-to-end trading solution in Python that integrates data analysis, strategy implementation, and performance evaluation into a seamless workflow.
 4. Foster analytical thinking by interpreting performance metrics such as profitability, drawdowns, and Sharpe ratios, leading to actionable insights and strategy refinement.
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Project Procedure

Step 1: Market Data Analysis

- Collect and preprocess historical stock market data (e.g., prices, volumes).
- Select a group of stocks or all stocks from indexes such as Nifty or Sensex for analysis.
- Identify patterns or signals indicative of trading opportunities.
- Visualize trends, patterns, and relationships in the data for initial insights.

Step 2: Strategy Development

- Select and design trading strategies (e.g. trend-following, momentum trading and many more).

- Use technical indicators and statistical models (such as time series models) to refine these strategies (not limited to these only).
- Can explore the application of machine learning techniques to enhance strategy design and predictive accuracy.
- Document the rationale and expected outcomes of the chosen strategies.

Step 3: Backtesting Framework

- Build a Python-based framework for backtesting strategies on historical data.
- Incorporate realistic trading scenarios by accounting for transaction costs.
- Measure performance using metrics like total returns, risk-adjusted returns, drawdowns and many more.

Step 4: Risk Management

- Develop risk control measures, such as setting stop-loss limits and managing position sizes.
- Can explore portfolio diversification.
- Optimize risk-return trade-offs for the developed strategies.

Step 5: Evaluation and Refinement

- Conduct backtesting for the period from January 2018 to December 2023 to ensure thorough historical analysis.
- Evaluate strategy performance using comprehensive backtesting results.
- Compare strategies based on profitability, risk management, and consistency.
- Refine models to address weaknesses identified during backtesting.

Step 6: Implementation

- Integrate all components into a Python-based end-to-end algorithmic trading system.
- Ensure modularity and flexibility for future strategy adjustments.

Deliverables

1. Jupyter Notebook

- Python code implementing trading strategies, technical indicators, statistical analysis and machine learning models (if used any).
- Backtesting results and visualizations.

2. Strategy Documentation (3-4 pages)

- Detailed explanation of strategy selection and the rationale behind each choice.
- Performance metrics analysis with insights and recommendations for improvement.

- Discussion of model assumptions, limitations, and potential refinements.

3. Presentation

- A presentation detailing your model selection, trading strategy, and visualizations.
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Evaluation Criteria

1. **Strategy Effectiveness:** Originality and logical soundness of trading strategies.
 2. **Technical Implementation:** Quality of Python code, including modularity and documentation.
 3. **Performance Analysis:** Depth of insights drawn from backtesting metrics.
 4. **Risk Management and return generation:** Effectiveness of measures to limit losses and optimize returns.
 5. **Presentation Quality:** Clarity and organization of documentation and code repository.
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Why This Project Adds Value?

1. **Industry Relevance:** Provides practical skills in algorithmic trading, a highly sought-after domain in finance.
 2. **Technical Expertise:** Enhances Python programming proficiency and data analysis capabilities.
 3. **Strategic Thinking:** Builds an understanding of market dynamics and risk management.
 4. **Portfolio Enhancement:** Demonstrates a blend of finance, statistics, and programming expertise on resumes.
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Some Useful Resources:

- (1) <https://zerodha.com/varsity/module/technical-analysis/>
- (2) https://youtube.com/playlist?list=PLtqRgJ_Tlq8Y6YG8G-ETIFW_36mvxMLad&feature=shared
- (3) <https://youtu.be/xfzGZB4HhEE?feature=shared>
- (4) https://youtube.com/playlist?list=PLvcbyYUQ5t0UHOLnBzl46_Q6QKtFgfMGc3&feature=shared
- (5) <https://youtu.be/ZX-Tp4zgJYc?feature=shared>
- (6) <https://youtu.be/n5xGsMWEpT8?feature=shared>
- (7) <https://www.investopedia.com/articles/trading/10/create-trading-strategies.asp>
- (8) <https://corporatefinanceinstitute.com/resources/career-map/sell-side/capital-markets/trading-strategy/>

Project 3 - Financial Modelling for Valuation Using DCF

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Project Overview

The project focuses on creating a comprehensive financial model to evaluate the valuation of a company using the Discounted Cash Flow (DCF) methodology. Participants will analyze historical financial data, forecast future cash flows, and compute the intrinsic value of a company by discounting these cash flows to their present value. The project aims to develop technical proficiency in financial modelling, strategic thinking, and decision-making, providing students with industry-relevant skills.

Objectives

1. Collect and analyze a company's financial data to understand its historical performance and assess its financial health.
 2. Develop projections for future financial outcomes based on historical trends and key business assumptions.
 3. Create a valuation model that calculates the intrinsic value of a company by applying appropriate financial and analytical techniques.
 4. Evaluate the impact of different scenarios and assumptions on the company's valuation to explore potential risks and opportunities.
 5. Compile insights into a professional report and presentation to demonstrate findings effectively.
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Project Procedure

Step 1: Company Selection and Initial Research

- Select a publicly listed company.
- Conduct background research to understand the company's business model, market dynamics, and financial health.
- Gather historical financial data from sources like annual reports or financial databases.

Step 2: Financial Statement Analysis

- Evaluate past performance using historical income statements, balance sheets, and cash flow statements.
- Perform ratio analysis (liquidity, profitability, efficiency) to identify trends and benchmarks.
- Assess the company's competitive position within its industry.

Step 3: Forecast Development

- Project future revenues, expenses, and profits based on historical data and market research.
- Estimate capital expenditures, working capital requirements, and tax obligations to create a comprehensive financial forecast.

Step 4: Free Cash Flow Calculation

- Compute unlevered free cash flows (FCFs) from forecasted financial statements.
- Adjust for non-cash expenses, changes in working capital, and capital expenditures.

Step 5: DCF Model Construction

- Use the forecasted FCFs and the WACC as the discount rate to calculate the present value of cash flows.
- Estimate the terminal value to account for cash flows beyond the forecast horizon.
- Combine the present values to derive the company's enterprise and equity value.

Step 6: Scenario and Sensitivity Analysis

- Test the model under different scenarios (e.g., optimistic, pessimistic) by varying key assumptions like growth rate and discount rate.
- Conduct sensitivity analysis to evaluate the impact of individual variables on valuation outcomes.

Deliverables

- A detailed DCF model in Excel Sheet, including all calculations, assumptions, and results.
 - A professional presentation summarizing the DCF model, key assumptions, findings, and actionable insights.
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Evaluation Criteria

1. **Model Accuracy:** Precision in calculations and logical flow in the DCF model.
2. **Assumption Validity:** Realism and soundness of assumptions made in forecasting and valuation.
3. **Analysis Depth:** Level of detail in financial and sensitivity analysis.

4. **Insights and Recommendations:** Depth and practicality of strategic conclusions derived from the analysis.
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Why This Project Adds Value?

1. **Real-World Skills:** Provides hands-on experience in financial modelling, forecasting, and valuation.
 2. **Resume Enhancement:** Demonstrates advanced analytical and financial planning skills.
 3. **Strategic Insights:** Enhances understanding of business performance and valuation techniques.
 4. **Career Readiness:** Prepares participants for roles in investment banking, equity research, or corporate finance.
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Some Useful Resources:

- (1) <https://www.youtube.com/playlist?list=PLUkh9m2BorqkHJz49csCvaCXf3diCLRLI>
- (2) <https://corporatefinanceinstitute.com/course/learn-to-read-financial-statements-free-course/>
- (3) <https://zerodha.com/varsity/module/financial-modelling/>
- (4) <https://www.investopedia.com/terms/d/dcf.asp>
- (5) <https://corporatefinanceinstitute.com/resources/financial-modeling/dcf-model-template/>
- (6) https://youtu.be/gLULdxrS-CU?si=21nmvm2iAM_3Dg_Q