Vardan Verma
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Examination	University	Institute	Year	CPI/%
Graduation	IIT Bombay	IIT Bombay	2026	8.97
Intermediate	NIOS	Home School	2022	83.40%
Matriculation	CBSE	MLZS, Muzzafarnagar	2020	98.80%

Scholastic Achievements

○ Attained an **All India Rank 37** in **JEE Mains** exam from a pool of **0.9M+** students *(2022)*
○ Achieved **All India Rank 339** in **JEE Advanced** from a pool of **0.15M+** aspiring students *(2022)*
○ Conferred with an **AP (Advanced Performer)** grade, given to only **1%** students, in Quantum Physics *(2022)*

Work Experience

Summer Intern at Franklin Templeton (Summer 2024)

○ Developed a Python script utilizing **Bloomberg's BLPAPI** for an in-depth **analysis of residential mortgage-backed securities (RMBS)** using the **Core Mortgage Premium (CMP)** service of Bloomberg
○ Created a **web application** integrated with **Bloomberg's API** for real-time financial data retrieval, sending requests from the user's browser to multiple hosts within the same LAN creating a distributed system
○ Developed a web page end-to-end using **PHP** for the backend and **Snowflake** for data availability, enabling the comprehensive **analysis of multiple bond spreads** under various pricing and **market scenarios**
○ Assisted in **transitioning** the company's **database** and website from **MySQL to Snowflake**, significantly improving website response time and ensuring a faster, seamless user experience

Bharat GPT (Autumn 2024)

○ Created a Python script using **Selenium** to scrape data from **500+** web pages, gathering data for model building
○ Helped **fine-tune** the model by making **Q/A pairs** from scraped data and trying different training methods
○ Finally to fine-tune the model we gave the model a **paragraph and question**, then compared its answer to the real one using **BLEU scores**

Key Projects

Auto Trader-Bot (Spring 2023)
Course Project | Guide: Prof. Ashutosh Gupta

○ Implemented **order book processing** using **maps and priority queue** for matching of orders in buy book and sell book for **autonomous trading in simulated markets**, ensuring high-speed and efficient order management
○ Created a realistic **simulation of stock market** dynamics, complete with **virtual traders**, by using **threading in C++** enabling the testing and refinement of the bot's decision-making across various market scenarios
○ Implemented basic **statistical arbitrage** by taking advantage of price disparity in different markets and accordingly placed orders using **maps** involving meticulous analysis of order books across multiple markets

Terminal Chat Application (Autumn 2024)
Self Project

○ Developed a terminal-based **chat application** using Python and **TCP sockets**, implementing custom **server-side functionality** including user registration, authentication, and **load balancing** to ensure efficient message handling
○ Engineered a **message persistence** system and **inter-user data sharing** mechanism, enabling seamless communication and message retrieval across multiple client sessions while maintaining data integrity
○ Designed and i**mplemented a server architecture from scratch**, incorporating features such as **concurrent client** handling via **threading**, password **encryption** and deployed on the CSE server

Options Trading Optimizer (Autumn 2023)
FinSearch | Finance Club, IIT Bombay

○ Developed an **options trading model** using reinforcement learning, implementing a Deep Q-Network (**DQN**) on the Nifty 50 dataset and conducted comprehensive comparative analysis against established time series models
○ Leveraged **scikit-learn** and **TensorFlow** frameworks to train the model, employing **optimization techniques** like **Adam optimizer** to enhance performance and predictive accuracy in options trading scenarios
○ Implemented a robust **validation** strategy by excluding specific years from the training data (2001-2020) for **out-of-sample testing** simulating **real-world market** conditions and assessing the model's generalizability

OpenAI API Integrated Quiz Answer Generator (Autumn 2023)

Self Project | IIT Bombay

o Developed a **Python** script that interfaces with **OpenAI via API**, capturing screenshots upon interaction with a screen icon and facilitating seamless **image transfer** for processing by **ChatGPT-4**

o Streamlined the query-answer workflow by using **Tkinter** to display answers promptly on the bottom right corner

o Focused on **automating** quiz answer generation to significantly improve efficiency, **minimize manual input**, and ensure quick, reliable access to information

Simple File System (Autumn 2024)

Course Project | Guide: Prof. Mythili Vutukuru

o Designed and implemented a **simple filesystem** in C++ with support for **soft links**, **hard links**, and a basic directory structure, enhanced with **inode management** and **direct and indirect blocks** for efficient file storage

o Integrated a **disk buffer cache** to improve read/write performance by minimizing disk access and developed a **log system** to **prevent filesystem crashes** during unexpected program stops or crashes while writing data

o Implemented additional features such as file creation, deletion, reading, writing, and seeking and error handling

Side Projects

o **Reader-Writer Synchronization (Autumn 2024)**: Implemented a high-performance reader-writer lock system prioritizing writers, using Pthreads and conditional variables in C++

o **Custom Semaphore Implementation (Autumn 2024)**: Developed 'Zemaphore', a custom semaphore using conditional variables and Pthreads in C++, and implemented a thread-safe List with it

o **Image Compression Algorithm (Spring 2022)**: Engineered an image compression solution using K-means clustering for RGB color space quantization, achieving up to 60% file size reduction

o **File Classifier (Autumn 2023)**: Constructed a Bash-based folder management utility for categorizing files by extensions with command-line arguments for file types and target directory

o **Wordle Solver (Spring 2023)**: Developed a web scraper to aggregate a word list and created a Wordle solver class using OOP principles for optimized solutions

o **File Compressor (Autumn 2023)**: Implemented a file compression pipeline using Run-Length Encoding, Huffman, and LZ77 algorithms, including the DEFLATE algorithm for high compression ratios

Positions of Responsibility

Media and PR Organizer (October 2022 - March 2023)

o Played a key role in organizing the **E-Summit** event conducted by the **Entrepreneurship Cell**, managing events and public relations for a footfall of over **30,000** attendees

o Extended the reach of the E-Summit by proactively **engaging** in **off-campus** promotion, **visiting another college** to drive awareness and participation, effectively **broadening the event's audience**

Skills

o **Programming Languages**: Python, C++, Java
o **Tools and Technologies**: TensorFlow, PyTorch, Bloomberg BLPAPI
o **Web Development**: HTML, CSS, PHP
o **Database Management**: MySQL, SnowFlake

Interests

o **Operating Systems**: I am deeply fascinated by the workings of operating systems and enjoy exploring their intricacies, especially aspects like process management and concurrency

o **Competitive Programming**: I am keenly interested in competitive programming. My achievements include a maximum rating of 1748 (Expert) on Codeforces and a 4-star coder on Codechef

o **Machine Learning and Artificial Intelligence**: Passionate about leveraging AI to solve real-world problems, particularly in the finance and healthcare sectors

Extracurricular Activities

o Awarded the title of Student of the Year for Academic Year 2019-20 by Mount Litera Zee School, Mzn (2019).
o Completed a year-long National Cadet Corps (NCC) program at IIT Bombay (2022).
o Participated in the EnB Buzz competition, presenting a pitch for a new social media app (2022).
o Designed and developed a remote-controlled robot, and participated in XLR8 competition (2018).