Aadesh Tikhe

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About Me!

I am a curious, self-driven learner passionate about solving complex problems using mathematics, computer science, and logical reasoning. With a background rooted in project development, research, and technical leadership, I enjoy turning abstract ideas into practical applications.
Goal: Contribute to cutting-edge AI research by identifying new patterns, addressing fundamental challenges, and working at the crossroads of logic, mathematics, and machine learning. I aspire to build ethical, human-centered systems that simplify complexity and deepen understanding.

Education & Academic Achievements

Amity University, Mumbai *Aug 2023 – Present*
Bachelor of Computer Applications (BCA) *(Expected May 2026)*

- CGPA: 8.47 / 10.0 (till date)
- **Key Coursework:** Operating Systems, Theory of Computation, Comparative Learning Algorithms, Linear Algebra for ML

Wockhardt Global School (IB), Chhatrapati Sambhajinagar *May 2017 – May 2022*
IB Diploma Programme (DP), 2020–2022 — Final Grade: 30 / 45
IB Middle Years Programme (MYP), 2017–2020 — Final Grade: 85%
Head Boy & Leadership Roles

- **Extended Essay:** Analyzed the time complexity of the NegaMax algorithm (Strazilla) vs. Alpha-Beta Pruning (NNUE Stockfish)
- **Main Subjects:** Computer Science HL, Mathematics: AA HL, Business Management HL
- Led school initiatives as **Head Boy**, including playground renovation and MUN 2020 organization
- **Chaired UNICEF at WGS MUN** 2021; facilitated engaging agendas and resolutions
- Served on the **Board of Directors, Rotaract Club Aurangabad**, fostering leadership and collaboration
- Led **Stage Management Team at TEDxYouth@WGS**; oversaw technical execution and speaker coordination
- Initiated **Stevia The Developer** (2019–2020): Researched and promoted Stevia farming in Marathwada; grew and tested plants independently, raised awareness among farmers, and overcame stage fear by addressing diverse audiences on health and economic benefits

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Publications and Conferences

Probability in Regular 2-Polytopes *Aug 2022 - Dec 2024*

- Independently conducted research from 2022–2024 on a novel spatial probability model within regular 2D polytopes
- Proposed a Periodic Cotangent Function to model the probability distribution of a 0 polytope relative to the centroid and boundary
- Presented this work at the **Indian Mathematical Society Conference** (MIT-WPU, Pune) on **25 December 2024**, gaining valuable feedback and insights
- Publication currently in process; preview available at youtu.be/Vwe1ojJnU_A

Discrete Square Residual Structures (DSRS) *Jan 2024 - Present*

- Independently developed the framework of **Discrete Square Residual Structures (DSRS)**, a novel number-theoretic construction where every integer yields its own π
- Introduced residual sequences α, β and layer mappings $U(n), L(n)$, leading to infinite products that approx-

imate π or 1 depending on divisibility conditions

- Established connections to the Wallis product, entropy growth with increasing μ, and convergence phenomena across arithmetic classes
- Preprint submitted for peer review; open-source code and documentation available at github.com/AST12212224/DSRS
- Archived on Zenodo with DOI: 10.5281/zenodo.17101750

É. Lucas Approach to Fibonacci Computation *Dec 2024 – Apr 2025*

- Independent research analyzing **Édouard Lucas's Pascal Triangle Method** for calculating the exact n^{th} Fibonacci number without recursion.
- Compared Lucas's combinatorial approach to classical methods in terms of **computational complexity and performance efficiency**.
- Paper titled *"Analyzing the Computational Complexity and Performance Efficiency of Édouard Lucas Pascal's Triangle Method vs. Other Fibonacci Computation Approaches"*.
- Demonstrated the feasibility of Lucas's method in resource-constrained environments.
- Publication currently in process; preview available at Medium Blog.
- Code implementation available at GitHub Repository.

Projects and Contributions

OEIS Contributor – Integer Sequence Research *oeis.org/wiki/User:Aadesh*

- **Authored closed-form formula for** A259569, now cited on the official OEIS page under contributor name
- **Corrected mathematical inaccuracies in** A130823, improving sequence integrity and documentation
- Active contributor on the OEIS Wiki — a globally recognized encyclopedia of integer sequences

myBash – Bash & Linux Commands Repository (Shell) *Ongoing*

- A collection of useful Bash commands, Linux one-liners, and `.bashrc` customizations. Includes a cron job for auto-updating Homebrew monthly. Personal notes and hands-on summaries from tutorials.
- GitHub Repository

Manim Codes for Math Research Presentation (Python [Manim], C++) *Ongoing*

- Created Manim animations to visually illustrate concepts from my math research.
- Used in YouTube presentation: Watch here.
- GitHub Repository

Django-POL_Agro Web Platform (Python, HTML, CSS) *2021 – 2022*

- Built for a client during IBDP; developed a full-stack Django-based CRUD platform.
- Connects fertilizer wholesalers with farmers to streamline queries and product access.
- Hosted on localhost for demo; source code: GitHub Repository.

Uncertainty-Stability Quotient (USQ) (C++ [iomanip, and gmpxx.h]) *2024 – 2025*

- Proposed a novel power-ratio function modeling the transition from instability to asymptotic certainty.
- Applications span algorithm analysis, numerical methods, fractals, ML feature scaling, quantum transitions, and financial modeling.
- Detailed write-up: Medium; source code: GitHub.

Pascal's Triangle Row for Fibonacci(C [stdlib.h, math.h and string.h]) *Feb 2025 – Present*

- Explored a novel method to derive Fibonacci numbers using coefficient permutations from rows of Pascal's Triangle
- Wrote six C-based brute-force algorithms testing all $^{3^n}$ multiplier combinations ({-1, 0, +1}) to identify valid representations
- Collected large-scale output data into CSV files and performed structural analysis to find mathematical patterns
- Handled dataset processing and filtering for pattern recognition — aligning with core data science practices
- GitHub: github.com/AST12212224/Pascals-triangle-row-for-Fibonacci

Key Skills

Languages: C++, C, Java, Python, SQL, Bash
Libraries & Frameworks: Django, Manim, Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, Pygame
Tools & Platforms: Git, Docker, Jenkins, Maven, Google Cloud, AWS, Google Colab, LaTeX.
Core Strengths: Mathematics, Data Structures & Algorithms, Artificial Intelligence, Machine Learning, C Programming, Operating Systems (incl. Bash Shell), and Computational Theory
Hobbies & Interests

- Painting – Creative expression through various mediums.
- Cycling & Hiking – Fitness and nature exploration.
- Piano – Self-taught music composition.
- Meditation – Vipassana practice for mindfulness.
- Mathematical Puzzles – Exploring number theory and logic.

Languages: English, Hindi, Marathi, German (A1 level)

Specialised Courses & Certifications

- **Domestic Data Entry Operator** – English Course (Govt. recognized)
- **Vipassana Meditation Courses:** Completed 3 residential courses and served in 1, reflecting strong commitment to mindfulness and discipline.
- **Youth India Expressed Summit** – Participated in national-level youth leadership event.
- **Harvard Model United Nations (HMUN) 2018** – Represented school in international MUN.
- **Certified Lean Six Sigma (White Belt):** Gained process improvement experience using Minitab, Excel, Python, Lucidchart, PowerPoint, and Microsoft Project.