

VARUN PATHAK

☎ +1 (289) 981-2868 ✉ pathav4@mcmaster.ca 🔗 linkedin.com/in/v5run 🌐 github.com/v5run 📁 v5run.github.io/

Education

McMaster University

Expected Grad: May 2027

Software Engineering and Management Co-op (B.Eng.Mgt.)

Hamilton, ON

- Dean's Honors List (2023, 2024)

Relevant Courses:

- Data Structures and Algorithms
- Software Development (C, Bash/Unix)
- Software Design Patterns
- Object-Oriented Programming (Java)
- Digital Systems + Comp. Architecture
- Intro. Accounting + Marketing

Projects

Garden of Eden - Blockchain | [Source Code](#)

Java | MongoDB | BouncyCastle

- Developed a decentralized blockchain wallet system in **Java**, utilizing MongoDB for scalable transaction storage, resulting in a robust and secure platform capable of handling high transaction volumes without data integrity issues.
- Engineered a secure transaction system utilizing **ECDSA** from **BouncyCastle** for digital signatures and **SHA-256** for hashing, ensuring the integrity and authenticity of blockchain transactions.
- Implemented custom wallet functionality with public/private key pairs incorporating **Java Security**, enabling users to send and receive funds securely.
- Developed and integrated **MongoDB's NoSQL** database for efficient and scalable storage of blockchain transaction-block data, optimizing data models for high-speed, high-volume environments, and enabling real-time tracking and querying of blockchain activities.

Maze Runner | [Source Code](#)

Java | Apache Log4j | API

- Implemented a maze-solving approach that adheres to the **right-hand rule and breadth-first searching (BFS)** to navigate mazes, including dynamic direction changes based on wall detection and directional turns.
- Integrated **Apache Log4j** for comprehensive logging of maze-solving processes. Enabled detailed traceability of algorithm execution and path-finding decisions, which improved debugging capabilities and facilitated performance analysis.
- Emphasized clean code principles and best practices in **Java**, including **encapsulation, modular design**, and clear method documentation. Ensured maintainability and scalability of the codebase through well-defined **interfaces**, such as the MazeSolver interface, and well-organized method responsibilities.

Personal Portfolio | [Website](#) | [Source Code](#)

HTML | CSS | JavaScript | Google Sheets

- Developed a professional online personal portfolio using **HTML, CSS, and JavaScript** characteristics.
- Exploited **HTML/CSS** tags to create responsive, visual effects.
- Created an **automated text-receive system**, storing contact information in Google Sheets.

“Dice Art” Image Filter | [Source Code](#)

Python | Streamlit

- User is able to upload an image of their choice and have it visualized using only the six sides of a casino die.
- Leverages **Python's imaging library (PIL)** and **Streamlit** capabilities.
- Utilizes **Streamlit's** onboard functions to denote on-screen effects (loading bars, success messages, etc.)

Work Experience

AskTutors. INC

2023 – Present

Tutor (Math + Physics)

Oakville, ON

- One-on-one tutoring sessions (online + in-person) for **12+ students concurrently** in Grades 3-12 in **Math and Physics**, prioritizing individual learning gaps and enhancing overall understanding.
- Tailored lesson plans to meet diverse student needs and learning styles (inc. IEP).
- Monitored and assessed student progress, adjusting instructional techniques as needed to ensure optimal growth.

Technical Skills

Languages: Java, Python, C, MATLAB, Verilog, Bash, HTML, CSS, JavaScript

Developer Tools / Frameworks: Git, Maven, Github, MongoDB, Apache Log4j

Verbal Languages: English (Fluent, Native), French (DEL F B1 Certified), Punjabi (Full Verbal Proficiency).