

# Arnav Kumar

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## Projects

- Haskell CLI Chess Engine** ..... Aug 2022 - Present
- A functional programming chess engine that enables one to play chess from the command line.
  - Heavily uses the maybe monad, and lists as applicatives, monads, and functors.
- Javascript Modular Personal Website** ..... Mar 2022 - Aug 2022
- Built a modular website with javascript which reads from a contents data structure to generate a site.
- Bash Flashcards** ..... Apr 2022 - Apr 2022
- Built a tool to add terms and practice with a flashcard set for unix based systems.
- Python Braille ASCII Art Generator** ..... Apr 2021 - Jul 2021
- Takes images, and converts it into ASCII art using braille characters using the OpenCV library.
- Prognosing Idiopathic Pulmonary Fibrosis** ..... Dec 2020 - Jun 2021
- Predicted the future lung volume of Idiopathic Pulmonary Fibrosis patients with Tensorflow2, Pandas, and Scikit-learn.
  - Implemented an auto-encoder, linear regression, dense neural network, and Bayesian model.
- C++ Blackjack** ..... Apr 2021 - Jul 2021
- Used object oriented programming to implement a blackjack game which the computer plays as the house.
- Javascript Conway's Game of Life** ..... Apr 2020 - Mar 2020
- Created a javascript web version of Conway's Game of Life where generations can be simulated.

## Achievements

- 10<sup>th</sup> in Canada, **Asian Pacific Mathematics Olympiad** ..... 2022
- 11<sup>th</sup> in Canada, **Canadian Association of Physicists High School Exam** ..... 2022
- 2 time qualifier, 18<sup>th</sup> in Canada, **Canadian Mathematical Olympiad** ..... 2021 - 2022
- Ranked 12<sup>th</sup> in Canada and 17<sup>th</sup> internationally, **Sir Isaac Newton Physics Exam** ..... 2021 - 2022
- Invited to write, **United States of America Mathematical Olympiad** ..... 2022
- Bronze medalist, **Canada Wide Science Fair** ..... 2021

## Experience

- Tektorch.ai** ..... Apr 2022 - Jul 2022  
*Part-time junior programmer* ..... Online
- Learned web scraping, the project design process, and some basic data manipulation with python.
- Mathematics Competition Teacher** ..... Aug 2021 - June 2022  
*Voluntary math competition teacher* ..... Calgary, AB.
- Taught 4 children competition mathematics every week for 90 minutes after school.
- Code Ninjas West Springs** ..... Mar 2022 - Apr 2022  
*Part-time code sensei* ..... Calgary, AB.
- Mentored young students and helped them complete programming challenges in scratch, makecode, and javascript.
- University of Alberta** ..... Jul 2021 - Aug 2021  
*Computing Science High School Intern* ..... Online
- Analysed and created graphs of mouse position data during a psychology experiment.
  - Created natural language processing models to help determine the cause of a change in depressive language in Tweets.

## Education

- University of Waterloo** ..... 2022 - Present  
*Bachelor of Computer Science* ..... Waterloo, ON.
- Admitted with the Ronald G. Dunkley National Scholarship and the President's Entrance Scholarship of Distinction.
  - Plan on doubling majoring in pure math and computer science.
- Webber Academy** ..... 2008 - 2022  
*Webber Scholar from grade 6 to 12* ..... Calgary, AB.
- President of the Student Union and annual merit scholarship recipient.