



Fall 10-16-2020

Eckley Scholar Bobby Koirala '22 Devises Algorithm for Number Theory Problem

Rachel McCarthy
Illinois Wesleyan University

Follow this and additional works at: <https://digitalcommons.iwu.edu/news>

Recommended Citation

McCarthy, Rachel, "Eckley Scholar Bobby Koirala '22 Devises Algorithm for Number Theory Problem" (2020). *News and Events*. 4017.
<https://digitalcommons.iwu.edu/news/4017>

This Article is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at The Ames Library at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

Eckley Scholar Bobby Koirala '22 Devises Algorithm for Number Theory Problem

Oct. 16, 2020

BLOOMINGTON, Ill. — Junior [computer science](#) and [physics](#) double major Bobby Koirala '22 spent his summer designing a complex algorithm to compute a unique set of numbers within number theory, as part of his 2020 Eckley Fellowship project “Constructing Carmichael Numbers of Order 2.”

Each year, five upperclass students across multiple disciplines take part in the [Illinois Wesleyan University Robert S. and Nell B. Eckley Scholars and Artists Program](#), a summer-long fellowship in which students engage in an independent research or creative project with the mentorship of a faculty advisor.

A problem written on the math department’s white board first piqued Koirala’s interest in Carmichael numbers, a type of composite number in number theory that can satisfy a specific congruence relation. When he learned that Associate Professor of Computer Science Andrew Shallue also shared an interest in researching Carmichael numbers, requesting Shallue as his faculty advisor felt like the perfect equation. Shallue worked with Koirala on his Eckley project throughout the summer via email and video call, addressing technical issues and sharing his experience with number theory research.

In his endeavor to determine Carmichael numbers computationally, Koirala designed an algorithm that could calculate the numbers and added some restrictions on the parameter choices for the algorithm. The goal was to build an algorithm that still had many possible parameter choices, while also optimizing the algorithm so that it could finish constructing Carmichael numbers within a reasonable time frame.

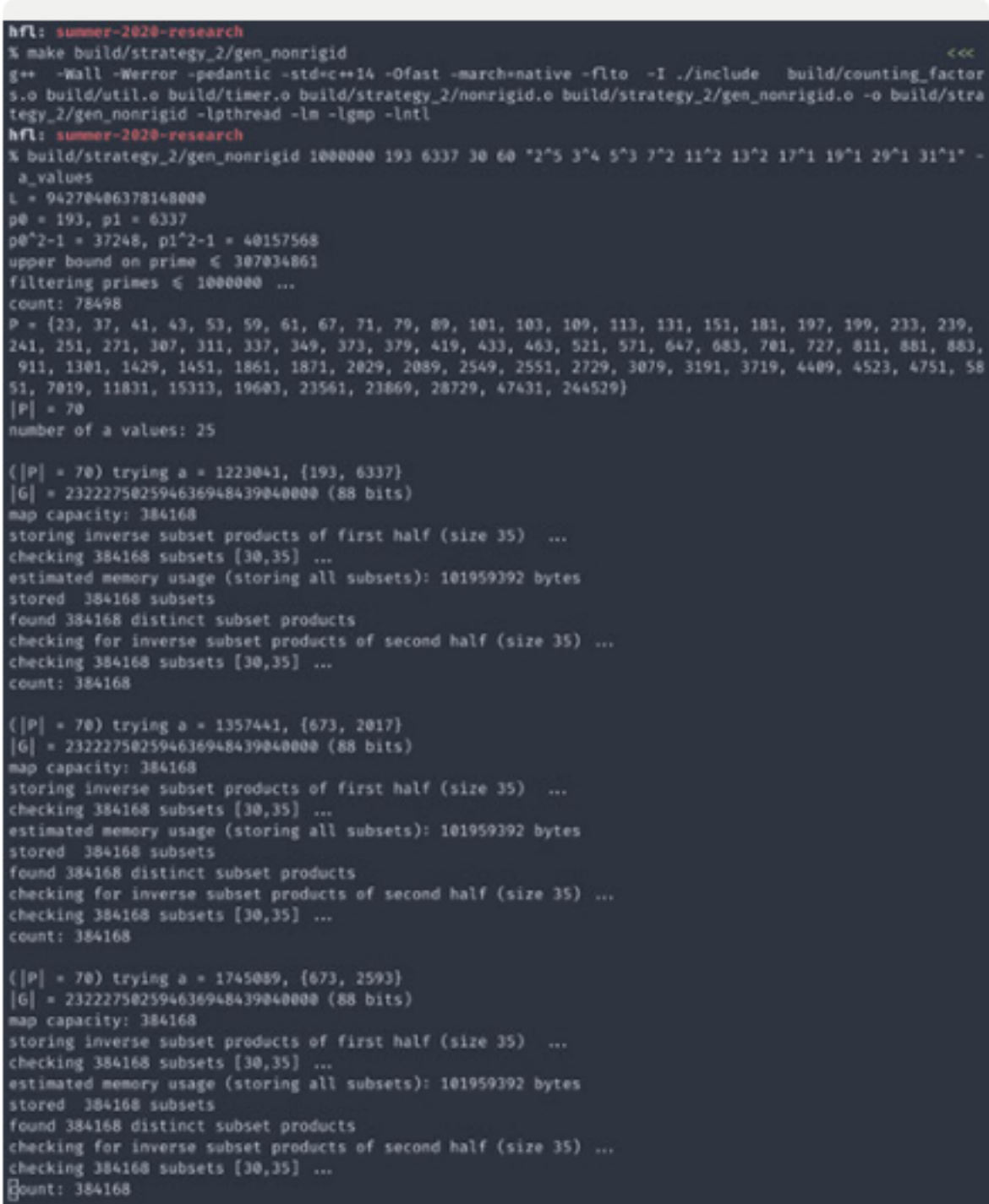
Koirala’s first algorithm accepted many parameters but was still too restrictive to prove useful; however, his second attempt looks promising, and he hopes to continue optimizing this algorithm during the fall semester.

While theoretical mathematics flies over the heads of most laypeople, Koirala came away from his experience as an Eckley Scholar with not only a better grasp of number theory but also a number of problem-solving skills to use in his everyday career.

“I found the experience very rewarding because I learned not only about theoretical topics, but I also learned a lot of practical knowledge that will be useful in my computer science career, through working with various tools and solving numerous technical problems that come up along the way.”



Bobby Koirala '22



A computer screenshot shows Koirala's algorithm in action.

By Rachel McCarthy '21