Abstract Submitted
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Original Code for Hydrogen's Radial Equation[1] DAVID DENNY[2], None — This project started with trying to understand the Radial Equation from Schrodinger's solution for the Hydrogen Equation. I worked through the derivation, then chose to include writing original atomic structure code using LabView that would be able to compute the electronic parameters for atoms such as energies, wave-functions, and transition probabilities. Deriving the equation of the Hydrogen atom is so complex that only an overview of it was given during the Quantum Mechanics and Modern Physics courses at BSU. I started writing the original code using LabView 2007 but eventually upgraded to LabView 2011. While writing the code I used the results from Griffiths Quantum Mechanics Textbook to ensure accuracy. The first parts of the code were relatively simple to encode. The difficulty arose when I attempted to encode the Associated Laguerre Polynomials (ALPs). The ALPs required that I determine a recursion relationship based on user input of the initial quantum numbers instead of using fixed tables delaying completion of the code for a few weeks. After verifying the recursion relation with the textbook results, I worked on how to combine it successfully with the existing code I had already written. With the help of Dr. Deveney, I successfully wrote original code to generate these functions symbolically and incorporate them into the full radial solutions. This code allows the user to successfully input different initial quantum numbers and display the full radial probabilities.

[1]Supervised by Prof. Ed Deveney
[2]I am presenting my undergraduate research. Currently, I am a MS Physics candidate at UMass Dartmouth.

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None

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