Mohamed Jamaloodeen* (mjamaloo@ggc.edu), Georgia Gwinnett College, Lawrenceville, 30043-6982. Using tools like Mathematica and Wolframalpha to develop exercise problems with solutions in a Discrete Math Course.

We discuss how we use freely available Mathematica notebooks such as on the Wolfram Demonstrations Project and the Wolframalpha capabilities in Mathematica to generate exercise problems with solutions for a discrete math course. At our institution we are moving to using open source materials and textbooks for our discrete math course. The challenge is finding enough exercise problems for topics across the course. Toward solving this we use the Mathematica/WolframAlpha tools to develop pools and banks of exercise problems across most of the topics in the course. We will demonstrate how we use these to write both questions and complete solutions to the following partial set of topics: sets (producing Venn diagrams, determining if a set is a subset of another, determining if two sets are equivalent), logic (obtaining and evaluating truth tables, producing circuits from propositions and vice versa, analyzing statements with quantifiers), induction proofs (including summation formulas, and inequalities with complete solutions), number theory (converting between number representation systems and the division algorithm). (Received September 15, 2019)