PROJECT PROPOSAL
Ritvika Nagula

Project Description:

I would like to develop a Python code to solve Cryptarithms involving addition and subtraction. A cryptarithm is a mathematical puzzle in which the digits are replaced by letters of the alphabet and there exists a one-to-one mapping between a letter and a digit. The leading letters cannot be mapped to zeroes. The inputs are letters of the alphabet while the outputs are digits from 0 to 9.

Algorithms:

Cryptarithms are solved as a variant of Constraint Satisfaction Problems. The heuristics MRV (minimum remaining values) and LCV (least constrained values) can be used to improve the performance. Since the domain of the outputs and inputs are constrained it is better to use CSP rather than applying any search algorithms or simple brute force.

Results:

I expect to show that the algorithm can solve cryptarithm, the number of iterations it can be solved in and compare the performances of the algorithm without using any heuristics, using one heuristic at a time, and using both heuristics at once.