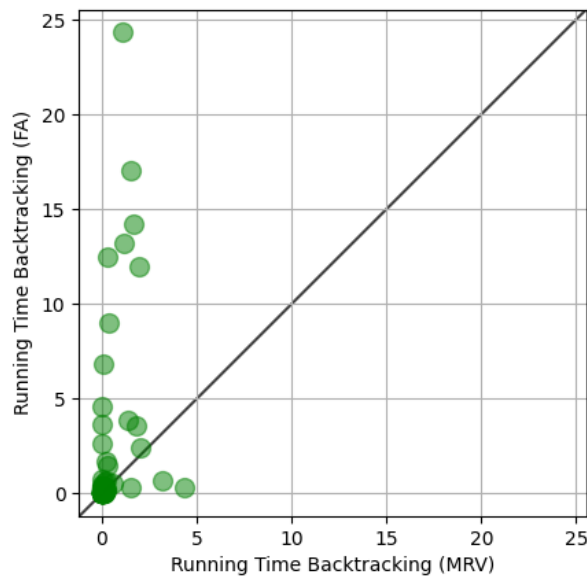


CMPUT 366 – Assignment 3: Report

About & Definition

- **First Available:** Selects and returns the first unassigned variable with a domain greater > 1 .
- **MRV:** Implements MRV heuristic & returns an unassigned variable with the smallest domain.

This scatter plot depicts the runtime (in seconds) of each of 95 sudoku puzzles using Backtracking, where **x-axis** shows runtime with MRV heuristics, and **y-axis** shows the runtime with FA heuristics.



Output

As shown in the plot, we have a few circles (~ 28) on right side of the diagonal, one on the diagonal (~ 1) and most of the circles (~ 66) on the left side of the diagonal, counting to 95 in total.

Numbers are counted after comparing the runtimes of both MRV & FA in their runtime_list

Interpretation of Graph:

- **On Left of diagonal:** MRV shows a more efficient runtime than FA, performing faster.
- **On Right of diagonal:** MRV has a longer runtime than FA, performing slower.
- **On diagonal:** MRV & FA showcase nearly identical runtime, performing similarly.

Summary

Although, '**First Available**' can terminate sooner and returns the unassigned variable compared to MRV heuristic which runs more iterations on an average. '**Minimum Remaining Values**' is an effective approach for selecting variables because it prioritizes variable selection, and choose the most constrained one first, that reduces the size backtrack tree & speeds up the computation.