CSC325 Artificial Intelligence – Lab Exercise 1

Last Sign-off Day: Feb 19, 2021 (*extended from Feb 12*)

Task 1

Write a Python program to play the *24 Game*. Please see

`https://en.wikipedia.org/wiki/24_Game`

for the game description. Specifically, your program needs to do the following:

- Randomly generate 4 integers in the interval [1, 13].
- Use these 4 numbers as input for a 24 Game and solve it in two cases:
  1. return a single solution for the input; and
  2. return all solutions;

  For instance, given numbers (6, 1, 6, 9), your program should find solutions including

  $$((9 - 6) + 1) \times 6,$$

  which you can represent as:

  ```
  Input: [6, 1, 6, 9]
  Found Solution:  (9sub6); (3add1); (4mul6).
  ```

- Record the processing time for both cases.

Task 2

Generalise your program so it takes N ($N \geq 4$) integers from the interval $[a, b]$, where $0 \leq a \leq b$, and produces an integer M. Analyse the performance of your program with respect to parameters a, b, N and M.