SSN College of Engineering

Department of Computer Science and Engineering

CS1403 — Design and Analysis of Algorithms

2019 – 2020

Session — 11

March 04, 2020

- This homework is due by 4pm on March 04, 2020
- Grace period may be given up to midnight of March 05, 2020
- You can upload only one ZIP file
- The naming convention is "<Your first name (first letter capital and all the other letters small)>-CS1403-S11.zip"
- The questions marked as "OPTIONAL" are, as the name implies, optional! Complete your core assignment first and attempt the optional problem only if you have sufficient time.

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1. Consider the following puzzle:

S	H	A	N	T	A	+
	M	E	E	N	A	
G	A	N	D	H	I	

The problem is to find a unique digit for each letter such that the summation is correct.

(a) Formulate this problem in state-space approach.

(b) Implement breadth-first search algorithm to find a solution.

(c) Implement depth-first search algorithm to find a solution.

(d) Implement a backtracking algorithm to find a solution.

(e) (OPTIONAL) Perform empirical analysis to check which of these three algorithms run faster to solve the puzzle.