Northern Michigan University (Marquette Co, MI)
CS 522-01-23W: Principles Of Programming Languages

Assignment 3
Due: Wednesday 5 April 2023 2:00 P.M. EST

Create a directory called "HW4" at the top level of your CS522-01-23W folder on PHILOS. You should solve this problem in either a text file (.txt) or an MS Word file (.docx). Place this file inside your HW4 folder along with an empty file or folder named DONE .

Imagine that you have a Turing Machine with a one-way infinite tape rather than a two-way. If such a Turing Machine falls off the tape on the finite end, the TM goes into an infinite loop. Show that one-way infinite tape Turing Machine and the regular Turing Machine solve the same set of problems.

Imagine that you have a Turing Machine with an infinite sheet rather than an infinite tape. The Turing Machine, at each step, can move up, down, left, or right, rather than just left or right. Show that this Turing Machine and the regular Turing Machine solve the same class of problems.

Imagine that a Turing Machine can only recognize and print two characters: '*' and <space>. Show how such a Turing Machine can emulate a Turing Machine with an arbitrary alphabet, and thus can solve the same class of problems.