Homework 2-----CSCI6339, Fall 2020

Due on October 14, 2020(Wednesday). There is also a midterm on October 14, 2020. This assignment will help you prepare for it.

Please type your solution.

1.Let N={1,2,3,….} be the set of all natural numbers. Prove Nx N x N ={(x, y,z)| x,y, and z are all in N} is countable.

2. Prove that the set of irrational numbers in [0,1] is not countable.

3. Show that there is a correspondence between the two intervals [0, 1) and [0,1].

4. Show that the language {M: M is a Turing machine with L(M) to be a finite set} is undecidable. You need to establish its connection to Atm={<M,w>| Turing machine M accepts input w}