## Assignment H - Computability 2

Using Online text, submit the following proofs.

For all the following items, you may assume that the Decidable and Undecidable Languages listed in the [Quick Reference](https://gouda.msudenver.edu/moodle/mod/resource/view.php?id=8915) are already proven.

H1. Let LC = { w | w = < D1 > < D2 > < D3 > ... } be a language consisting of string representations of Turing machines that are deciders. That is, each machine Di halts and accepts or rejects on every input. Use contradiction to prove that LC is not Turing-recognizable.

(HINT: Assume that LC is Turing-recognizable and thus enumerable. Show that LC cannot include deciders for all decidable languages; that is, some decidable language DX must be left out by using the diagonalization method.)

H2. Let LD = { < T > | T is a Turing Machine that accepts *w* if it also accepts *w*R }. Prove that LD is undecidable.

H3. Prove that the complement of a Turing decidable language is decidable.

H4. Prove that the complement of a Turing-recognizable but not decidable language is not Turing-recognizable.

H5. Reflect on your experience in attempting to develop these proofs. Report your observations and insights.