CS 6505: Computability & Algorithms

Homework 2, due in class Wednesday, Feb. 3

1. Describe a Turing Machine that accepts the language $0^n 1^n 2^n$ and rejects all other strings. That is, the set of strings consisting of n zeros followed by n ones and then n twos. It should be clear from your description exactly how to build the described TM.

2. Describe how to use a TM to simulate a RAM computer. In particular, describe the structure on the TM's tape of the simulated RAM and algorithms to store to and load from it.

3. Let LOGSPACE=DSPACE($\log n$). Let PTIME be the set of all languages which can be decided by a TM using at most a polynomial number of state transitions. Prove that LOGSPACE $\subseteq$ PTIME.