

CS 273
Discussion section 14

23 April 2008

1 Questions on homework 13?

Any questions? Complaints, etc?

2 3-dimensional Dovetailing

A and B are two recognizable sets. Give an enumerator for L :

$$L = \{\langle M, w \rangle : M \text{ is a TM and } \langle M \rangle \in A \text{ and } w \in B \text{ and } M(w) = \text{"yes"}\}$$

Solution: Let M_A and M_B be enumerators for A and B respectively.

1- $i \leftarrow 1$.

2- restart (or start if this is the first time) M_A and simulate till it gives out the next (or first) string of A , store that string in M_i .

3- restart (or start if this is the first time) M_B and simulate till it gives out the next (or first) string of B , store that string in w_i .

4- for $1 \leq k \leq i$ do

5- for $1 \leq m \leq i$ do

6- if M_k is a valid TM code

7- if there is no previous history of $M_k(w_m)$ start a thread for $M_k(w_m)$.

8- simulate one more instruction of thread $M_k(w_m)$, if it halts and accepts print $\langle M_k, w_m \rangle$.

9- $i \leftarrow i + 1$ and goto step 2.