Nov 30

COMPSCI 3331

Fall 2022

What's next?

- Please complete feedback for the course: `feedback.uwo.ca`
- Assignment 4: due Dec 7, gradescope available. **Error in Q1 fixed.**
- Quiz 7, Asst 3: being marked.
- Quiz 5,6: grades available.
- Solutions up to Q7, A2 marking guide, MT solutions available.
- Yes, there will be review questions before the final!

Encodings of TM

- One transition $\delta(q_i, \alpha_j) = (q_k, \alpha_\ell, D)$. Encoding:

$$0^i 1 0^j 1 0^k 1 0^\ell 1 0^{m(D)}$$

  where $m(D)$ is $1, 2, 3$ if D is L, S, R, respectively.

- **Entire** TM M: Let $C_1, C_2, \ldots, C_m$ be the encodings of the m transitions of the TM. Encoding of M:

$$e(M) = C_1 11 C_2 11 C_3 11 \cdots 11 C_m$$

Encodings of TM

- Halting problem: $H = \{(e(M), w) \ : \ w \in L(M)\}$.
- H is r.e., but not recursive.
- Reduction: $E = \{e(M) \ : \ \varepsilon \in L(M)\}$ is r.e. but not recursive.