Automata and Logic (CSC2428)
Lecture 5 Outline

Prof. Leonid Libkin
outline by Alvin Chin

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1 Why we like automaton models so much?

1.1 Convert $\Phi \longrightarrow \mathcal{A}_\Phi$

1.2 Run $\mathcal{A}_\Phi$ on tree T

1.2.1 Complexity: $O(\| \mathcal{A}_\Phi \| \quad \| T \|)$

2 Linear-time temporal logic (LTL)

2.1 Theorem (Kamp, 1968) over strings LTL = FO

2.2 Regular expressions over formulas (Neven, Schwentick, 1999)

2.3 Efficient tree logic

2.4 Theorem: ETL $\approx$ MSO

3 Datalog

3.1 Calculate transitive closure trcl(x,y):- E(x,y)

3.2 Monadic datalog programs

3.3 Monadic datalog over unranked trees

3.3.1 Theorem (Gottlob/Koch, 2002)