Automata and Logic (CSC2428)
Lecture 5 Outline

Prof. Leonid Libkin
outline by Alvin Chin

October 28, 2005
1 Why we like automaton models so much?

1.1 Convert $\Phi \rightarrow A_\Phi$

1.2 Run $A_\Phi$ on tree $T$

1.2.1 Complexity: $O(||A_\Phi|| \parallel T \parallel)$

2 Linear-time temporal logic (LTL)

2.1 Theorem (Kamp, 1968) over strings $\text{LTL} = \text{FO}$

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

2.3 Efficient tree logic

2.4 Theorem: $\text{ETL} \approx \text{MSO}$

3 Datalog

3.1 Calculate transitive closure $\text{trcl}(x,y) :- E(x,y)$

3.2 Monadic datalog programs

3.3 Monadic datalog over unranked trees

3.3.1 Theorem (Gottlob/Koch, 2002)