Lecture #7: Regular Operations and Regular Expressions
Questions for Review

Regular Operations

1. Name the ***regular operations***.
2. Suppose that Σ is a finite and nonempty alphabet and let $L_1, L_2 \subseteq \Sigma^\star$. Give the formal definition of the ***union*** of L_1 and L_2. Explain in your own words what this language is.
3. Suppose that Σ, L_1 and L_2 are as above. Give the formal definition of the ***concatenation*** of L_1 and L_2. Then explain in your own words what this language is.
4. Suppose that Σ and L_1 are as above. Give the formal definition of the ***Kleene star*** of L_1. Then explain in your own words what this language is.
5. What is a ***closure property***? List the closure properties that were stated and proved (at least, informally) in this lecture.
6. Why are closure properties useful? (Note that they were used to prove something about several languages as part of this lecture.)

Regular Expressions

7. What is a ***regular expression*** over an alphabet Σ? (Your answer should include the "formal definition of a regular expression over Σ" included in the lecture slides).
8. How is are ***regular expressions*** in Σ related to ***regular languages*** that are subsets of $\Sigma^\star$?
9. Are regular expressions related to the ***regular operations*** discussed in the previous lecture? If so, then how?
10. State the formal definition of the ***language*** of a regular expression over Σ.