COMP3721 Tutorial 10

1 Recursive and Recursively Enumerable Languages

Q1. We know that the class of recursively enumerable languages is not closed under complementation. Show that it is closed under union and intersection.

2 Preparing the Midterm

Q2. Write regular expression for $L = \{w : w \text{ has at least two non-consecutive } b\text{s}\}$.

Q3. Let L_1 be a regular language on Σ, and let L_2 be an arbitrary language on Σ. We define

$$\frac{L_1}{L_2} = \{w \in \Sigma^* : wv \in L_1 \text{ for some } v \in L_2\}.$$

Show that $\frac{L_1}{L_2}$ is regular.

Q4. Write a context-free grammar that generates the following language.

$$L = \{a^n b^m : m = 2n \geq 0 \text{ or } m = n \geq 0\}$$