Homework 4

1. Prove that the language \( L_1 = \{a^i b^j a^k \mid i > j \text{ or } i < k, \text{ with } i, j, k \geq 0\} \) is not regular by using the pumping lemma.

2. Using closure properties of regular languages, prove that the language \( L_2 = \{a^i b^j a^k \mid i \leq j \text{ and } i \geq k, \text{ with } i, j, k \geq 0\} \) is not regular.