You are strongly encouraged to do all of the problems. However, only the ones marked with (*) will be graded.

(*) **Question 1:** Construct a push down automata that recognizes palindromes of both even and odd length, over alphabet $\Sigma = \{a, b\}$. (You may use non-determinism.)

**Question 2:** Construct a push down automata that recognizes the following language: $L = \{ x \mid x = a^i b^i, i > 0 \} \cup \{ x \mid x = a^i b^{2i}, i > 0 \}$. (You may use non-determinism.)