2. Consider the "prefix" operation over languages A and B:

   A prefix B = { w | w ϵ A and some prefix of w ϵ B }

   A string x is a prefix of string w if there exists a string xy = w. Show that B is regular.

   Let DFA_A be the DFA recognizing A and DFA_B the DFA recognizing B.

   Proof: Let DFA_A = (Q, $\sum$, δ, q_0, F_A)

   Notice: The only difference between A and B should be the accept states so DFA_B = (Q, $\sum$, δ, q_0, F_b)

   The accept states for machine DFA_B should be any state along a path to an accept state in DFA_A. so q $\in$ F_b if and only if there's a path from q to an accepting state in DFA_A

   Therefore since we can construct a DFA for B we know it is regular