

For languages A and B , let the *shuffle* of A and B be the language

$$\{w \mid w = a_1b_1a_2b_2 \dots a_nb_n \text{ where } a_1, a_2, \dots, a_n \in A \text{ and } b_1, b_2, \dots, b_n \in B\}$$

Show that the class of regular languages is closed under the shuffle operation.