

Let  $H : X \times Y \rightarrow \mathbb{R}$  be a function.

For each  $x \in X$  and  $D = D_1 \times D_2 \subset X \times Y$ . let us consider the following function defined as follows:

$$F(x, D) = \inf_{d_2 \in D_2} H(x, d_2) - \sup_{d_1 \in D_1} \inf_{d_2 \in D_2} H(d_1, d_2)$$

Let  $x_1, x_2 \in X$ ,  $A = A_1 \times A_2$ ,  $B = B_1 \times B_2$  two nonempty subsets of  $X \times Y$  such that  $C = A \cap B \neq \emptyset$ .

**Problem:**

If  $F(x_1, A) > \epsilon$  and  $F(x_2, B) > \epsilon$  for some  $\epsilon > 0$ , then  $F(x, C) > \epsilon$ , for each  $x \in \{x_1, x_2\}$  and  $C = A \cap B$ ?????