EX: Find the simplest Sum-Of-Products (SOP) form for the following Boolean expression:

$$(A+B)(\overline{A}+\overline{B})C$$

SOL'N: We first use the distributive law to expand the expression. This is akin to "foiling" the terms. (FOIL = first, outside, inside, last)

$$(A+B)(\overline{A}+\overline{B})C = (A\overline{A}+A\overline{B}+B\overline{A}+B\overline{B})C$$

Terms $A\overline{A}$ and $B\overline{B}$ are zero since a signal cannot be 1 and 0 at the same time.

$$(A+B)(\overline{A}+\overline{B})C = (A\overline{B}+B\overline{A})C$$

We use the distributive law again to get our final answer in SOP form:

$$(A+B)(\overline{A}+\overline{B})C = A\overline{B}C+B\overline{A}C$$