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Solution for Problem S374

Without loss of generality, we can assume $a \geq b \geq c$ as the three given expressions are symmetric.

Then $\frac{b+c}{b+c-a} \geq 2 \Leftrightarrow 2a \geq b+c$ if $b+c > a$, which is true by our ordering assumption. If $b+c < a$, then $\frac{b+c}{b+c-a} \leq 0$ as $b, c \geq 0$.

Hence $\frac{b+c}{b+c-a}$ doesn't lie in $(1, 2)$.