If $a, b, c > 0.\, n \in N\,, n > 2$ then:

$$\sum \frac{b + c}{a + \sqrt[n]{2^{n-1}(b^n + c^n)}} \leq 2$$

Proposed by Marin Chirciu-Romania

Solution by Tapas Das-India

$$\frac{b^n + c^n}{2} \overset{CBS}{\geq} \frac{(c + b)^n}{2^n}$$

$$2^{n-1}(b^n + c^n) \geq (c + b)^n$$

$$\sqrt[n]{2^{n-1}(b^n + c^n)} \geq c + b \;(\mathbf{1})$$

$$\sum \frac{b + c}{a + \sqrt[n]{2^{n-1}(b^n + c^n)}} \overset{(1)}{\leq} \sum \frac{b + c}{a + b + c} = \frac{2(a + b + c)}{a + b + c} = 2$$

Equality holds for $a = b = c$