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Thotsaporn "Aek" Thanatipanonda* (thotsaporn@gmail.com), 87/99 Radjaprug Road, Bangwa, Bangkok, 10160, Thailand. *The Curious Bounds of Floor Function Sums.*

We consider the sums involving floor functions of the forms: for a fixed positive integer m ,

$$S_m(\{a, b\}, K) = \sum_{k=0}^K \left(\left\lfloor \frac{a+b+k}{m} \right\rfloor - \left\lfloor \frac{a+k}{m} \right\rfloor - \left\lfloor \frac{b+k}{m} \right\rfloor + \left\lfloor \frac{k}{m} \right\rfloor \right),$$

where $0 \leq a, b, K \leq m-1$ and

$$S_m(\{a, b, c\}, K) = \sum_{k=0}^K \left(\left\lfloor \frac{a+b+c+k}{m} \right\rfloor - \left\lfloor \frac{a+b+k}{m} \right\rfloor - \left\lfloor \frac{b+c+k}{m} \right\rfloor - \left\lfloor \frac{a+c+k}{m} \right\rfloor + \left\lfloor \frac{a+k}{m} \right\rfloor + \left\lfloor \frac{b+k}{m} \right\rfloor + \left\lfloor \frac{c+k}{m} \right\rfloor - \left\lfloor \frac{k}{m} \right\rfloor \right),$$

where $0 \leq a, b, c, K \leq m-1$. The bounds of the above sums are studied by Jacobsthal (1957), Carlitz (1960), Grimson (1974), and Tverberg (2012) and have been known. However, the bounds for the general sums $S_m(\{a_1, a_2, \dots, a_n\}, K)$ with $n \geq 4$ defined analogously have only been done partially by Onphaeng and Pongsriiam (2017). The other bounds are still left open. In this talk, we discuss these results and give the conjectures of the complete bounds. (Received September 23, 2017)