1114-05-105 **Thu Dinh*** (`tndinh@cpp.edu`), 3301 Yorba Linda Blvd, Apt 236, Fullerton, CA 92831. *The Repeated Sums of Integers.*

Abstract: It is well-known that the sum of integers from 1 to n is

$$1+2+...+n=\frac{n(n+1)}{2}$$

But what happens when we add these sums together? Do we have a closed form formula for $\sum_{i=1}^{n}\sum_{j=1}^{i} j = 1+3+6+ ...\frac{1}{2}n(n+1)$? Moreover, what happens if we keep taking the sum of the sums? In general, we will attempt to find a closed form formula for

$$\sum_{a_1=1}^{n}\sum_{a_2=1}^{a_1}...\sum_{a_m=1}^{a_{m-1}} a_m$$

We will then look at higher power of integers and repeat the process. Would we have a nice closed form formula for

$$\sum_{a_1=1}^{n}\sum_{a_2=1}^{a_1}...\sum_{a_m=1}^{a_{m-1}} a_m^k$$

for any positive power k? The technique used in finding these sums can be used to find a formula for the partial sum of many well-known sequences. It can also be used to count the number of lattice paths under some special conditions. (Received August 16, 2015)