Aufgabe2_3

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The first chart shows the values of the two summations, by using *double* and *long long integer* variables. As we can see there is no noticable difference between the values of $S_{(up)}$, $S_{(down)}$ and the approximated value of the harmonic series.

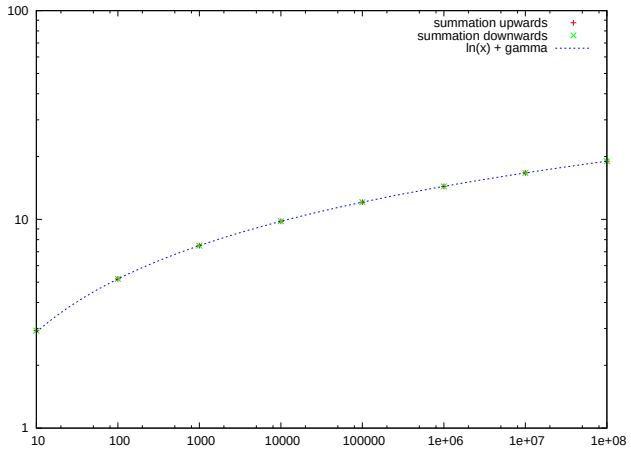

Abbildung 1: *Values using double precision*

Since it seems to be the taks to find differences between the two summation methods, we modified our programm to use *float* (but keept *long long integer* so we cloud use Ns higher then 10^8

It seems that the summation from N to 1 is more precise than the other method. As we saw in the previous assignment, the floating point operations have more precise results when done with smaller numbers. By summing up from N to 1 the numbers added become bigger, so the operations are always as much precise as both operands, while the other way round small values can easiely be lost by adding them to a much bigger number.

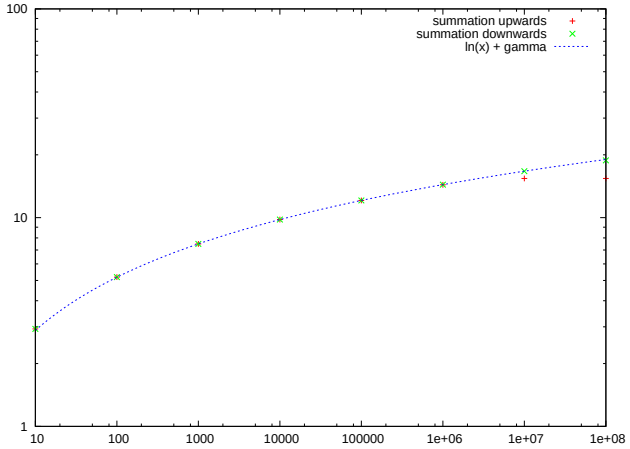

Abbildung 2: *Values using singel precision*

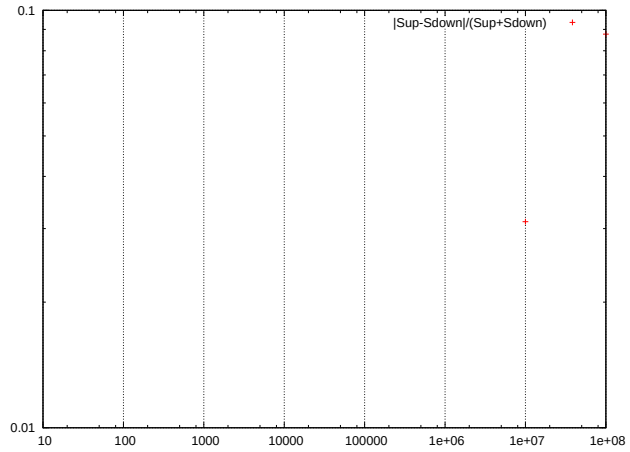

Abbildung 3: *desired plot*

On the last plot not much can be seen, since the values of $S_{(up)}$ and $S_{(down)}$ only differ when N is greater then 10^7.