Some congruences on hyperharmonic numbers

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The harmonic numbers, defined by $H_n = \sum_{k=1}^{n} \frac{1}{k}$ play important roles in mathematics. They can be generalized in many ways. The generalization we consider, called hyperharmonic numbers, are obtained by taking repeated partial sums of the harmonic numbers.

We investigate their arithmetic properties and obtain various basic congruences. Our tools include p-integers and r-Stirling numbers.