

ON NOTATIONS SYSTEMS FOR NATURAL NUMBERS AND POLYNOMIAL TIME COMPUTATIONS

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We have many notational systems for denoting natural numbers: unary, binary, decimal, p-adic, residues modulo a given sequence of numbers and many others. Indeed, different notations may be well suited for different purposes. Also the structure of a computing device that one uses may favour one notation system over the other one (e.g. computing in a modulo residues notation is well suited for parallel computations).

Thus, there is not a single “best” notation. However, we can investigate the set of all possible notations for natural numbers and investigate their general properties. In the talk I will show that the decimal notation (or, rather, its equivalence class) is a maximal notation in a certain natural ordering between feasible notations.

During the second part, I will talk about polynomial time recursion schemes for the notation for hereditarily finite sets in a style of Bellantoni and Cook (which is a work in progress).