

$$\mathcal{L}(SC, lm) = \mathcal{L}(RE)$$

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This paper deals with generative power of languages described by *Scattered Context Grammars* (SCG) that use *leftmost derivations* ($\mathcal{L}(SC, lm)$). The proof is based on simulation of *Multiparallel Grammar* (MPG). Languages described by MPG have the generative power of *Recursively Enumerable* languages ($\mathcal{L}(RE)$).

The simulation is managed by a finite automaton encoded into rules of SCG. This automaton works in three operation modes: (1) selector validation, (2) derivation step, (3) finalization.

The first symbol of the sentential form distinguish between operational modes. These modes are described in the separated parts of the proof. Transitions between these modes and selection of simulated rules in derivation steps are undeterministic as well as derivation steps of MPG.

The first part of the proof deals with a simulation of MPG selectors. A set of selectors are described as a set of regular expressions. Therefore, this set of regular expressions can be converted into a finite automaton accepting inputs described by the set of selectors.

The finite automaton is encoded as a part of sentential form. SCG rules which simulates validation by automaton have several parts. The first part represents the symbol under the reading head and the current state of the finite automaton. The second part represents next symbol from the input and next state of the finite automaton. The last part of the rule represents the place where processed symbols are moved.

Next part of the simulation deals with derivation steps. In case of MPG, on all symbols of sentential form are applied some production rule from the set of productions. The same principle as in previous part is used. The only difference is in the last part of the rule. It represents the place where the right-hand-side of the rule is expanded.

The last part of simulation called finalization converts all simulated terminals into terminals and remove auxiliary symbols.

The paper shows that derivations and selector validations of Multiparallel Grammar can be simulated by Scattered Context Grammar. Therefore, languages described by the Scattered Context Grammars have equal generative power as languages described by the Multiparallel Grammars which is equal to generative power of Recursively Enumerable languages.