Formal Grammar

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```
          formula_family  →    name
                               type
                               parameters
                               variables
                               blocks
                               quantifiers
                               quantifier_prefix
                               operators
                               output

                    name  →    name: [a-zA-Z0-9](_?\s?[a-zA-Z0-9])*

                    type  →    type: CNF
                             | type: circuit

              parameters  →    parameters: parameter_declaration

   parameter_declaration  →    param_name : param_type
                               param_constraints
                               parameter_declaration
                             | ε

              param_type  →    natural

        param_contraints  →    , param_name <= expression
                               param_constraints
                             | , param_name >= expression
                               param_constraints
                             | ε

               variables  →    variables: variable_declaration

    variable_declaration  →    var_name subindices
                               variable_declaration
                             | ε

              subindices  →    (subindices_list) subindices_constraints

         subindices_list  →    index more_subindices

         more_subindices  →    , subindices_list
                             | ε

                in_range  →    subindices_list in range

                   range  →    [expression, expression]

                  blocks  →    blocks: block_definition

        block_definition  →    define block
```

```
                               single_block
                           subindices_constraints
                           block_definition
                         | define blocks
                               multiple_blocks
                           subindices_constraints
                           grouped_in
                           block_definition
                         | ε

          single_block →   block_name := block_body

       multiple_blocks →   single_block
                           multiple_blocks
                         | ε

            block_body →   block_name more_names
                         | -block_name more_names
                         | variable_name more_names
                         | -variable_name more_names

            more_names →   , block_body
                         | ε

subindices_constraints →   where constraints
                         | ε

           constraints →   constraint more_contraints
                           constraint and constraint more_constraints
                           constraint or constraint more_constraints

            constraint →   in_range
                           assignment
                           expression

      more_constraints →   , constraints
                         | ε

            grouped_in →   grouped in block_name
                         | ε

           quantifiers →   quantifiers: quantifier_declaration

quantifier_declaration     block block_name quantified with quantifier
                           quantifier_declaration
                           blocks in block_name quantified with
                           quantifier
                           quantifier_declaration
                         | ε

            quantifier →   E
                         | A

     quantifier_prefix →   quantifier prefix: block_name

             operators →   operators: operator_declaration
```

```
                                 | ε

operator_declaration  →    block block_name has operator op
                           operator_declaration
                         | blocks in block_name have operator op
                           operator_declaration
                         | ε

                  op  →    AND
                         | OR
                         | XOR

              output  →    output: block_name

          param_name  →    [a-zA-Z](_?[a-zA-Z0-9])*

            var_name  →    [a-z](_?[a-z0-9])*

               index  →    [a-z](_?[a-z0-9])*

          block_name  →    [A-Z](_?[a-zA-Z0-9])* subindices_list

          expression  →    expression == expression
                           expression != expression
                           expression <= expression
                           expression < expression
                           expression >= expression
                           expression > expression
                           expression + expression
                           expression - expression
                           expression * expresión
                           expression / expression
                           expression mod expression
                           param_name
                           index


          assignment  →    index = expression
```