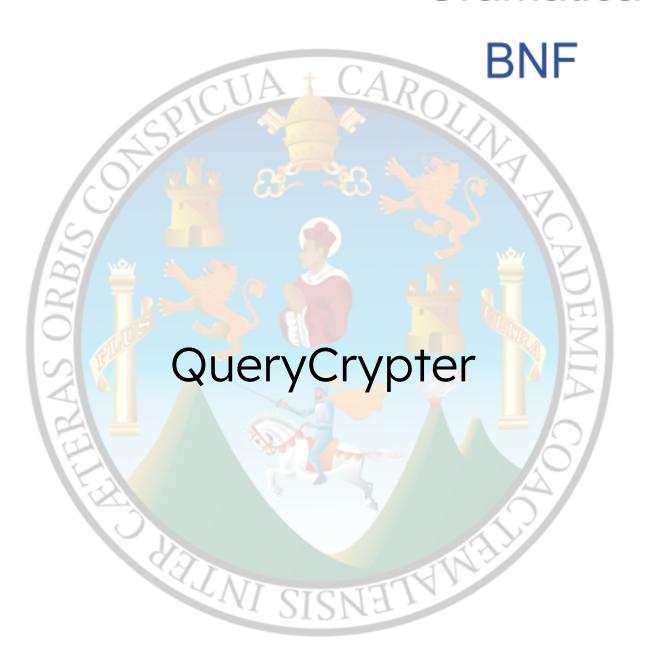
## Gramatica



```
<ini>::= <instructions>
<instructions> ::= <instructions> <instruction>
                 | <instruction>
<instruction> ::= <block>
                | <statement>
                | <assignment>
                | <function>
                | <ddl>
                | <dml>
<block> ::= "begin" <instructions> "end" ";"
<statement> ::= "declare" <variables> ";"
<variables> ::= <variables> "," <variable>
             | <variable>
<variable> ::= "@" "id" <type>
            | "@" "id" <type> "default" <expression>
<assignment> ::= "set" "@" "id" "=" <expression> ";"
<function> ::= <print>
            | <lower>
            | <upper>
            | <round>
            | <len>
            | <truncate>
            | <typeof>
<pri><print> ::= "print" <expression> ";"
<lower> ::= "select" "lower" "(" <expression> ")" ";"
<upper> ::= "select" "upper" "(" <expression> ")" ";"
<round> ::= "select" "round" "(" <expression> "," <expression> ")" ";"
```

```
<len> ::= "select" "len" "(" <expression> ")" ";"
<truncate> ::= "select" "truncate" "(" <expression> "," <expression> ")" ";"
<typeof> ::= "select" "typeof" "(" <expression> ")" ";"
<ddl> ::= <createTable>
        | <alterTable>
        | <dropTable>
<createTable> ::= "create" "table" "id" "(" <attributes> ")" ";"
<alterTable> ::= "alter" "table" "id" "add" <attributes> ";"
               | "alter" "table" "id" "drop" "column" <expression> ";"
               | "alter" "table" "id" "rename" "to" <expression> ";"
               | "alter" "table" "id" "rename" "column" "id" "to" <expression> ";"
<attributes> ::= <attributes> "," <attribute>
              | <attribute>
<attribute> ::= <id> <type>
<dropTable> ::= "drop" "table" <id> ";"
<dml> ::= <insert>
        | <select>
        | <update>
        | <truncate>
        | <delete>
<insert> ::= "insert" "into" <id> "(" <id_list> ")" "values" "(" <values> ")" ";"
<select> ::= "select" <id_list> "from" <id> ";"
          | "select" "*" "from" <id> ";"
          | "select" <id_list> "from" <id> "where" <expression> ";"
<id_list> ::= <id_list> "," <id>
           | <id>
<update> ::= "update" <id> "set" <columns> "where" <expression> ";"
```

```
<columns> ::= <columns> "," <column>
            | <column>
<column> ::= <id> "=" <expression>
<truncate> ::= "truncate" "table" <id> ";"
<delete> ::= "delete" "from" <id> "where" <expression> ";"
<expression> ::= <arithmetic>
               | <relational>
               | <logical>
               | <value>
               | "(" <expression> ")"
<arithmetic> ::= <expression> "+" <expression>
              | <expression> "-" <expression>
              | <expression> "*" <expression>
              | <expression> "/" <expression>
              | <expression> "%" <expression>
              | "-" <expression>
<logical> ::= <expression> "and" <expression>
          | <expression> "or" <expression>
          | "not" <expression>
<relational> ::= <expression> ">" <expression>
             | <expression> "<" <expression>
             | <expression> ">=" <expression>
              | <expression> "<=" <expression>
              | <expression> "=" <expression>
             | <expression> "!=" <expression>
<type> ::= "int"
         | "double"
```

```
| "date"
         | "varchar"
         | "boolean"
<values> ::= <values> "," <value> | <value>
<value> ::= <integer>
          | <decimal>
          | <time>
          | <text>
          | "true"
          | "false"
          | <id>
          | "null"
<integer> ::= [0-9]+
<decimal> ::= [0-9]+ "." [0-9]+
<decimal> ::= [0-9]{4} "-" [0-9]{2} "-" [0-9]{2}
<text> ::= "\"" [a-zA-Z][a-zA-Z_0-9]+ "\""
```

<id>::= [a-zA-Z][a-zA-Z\_0-9]+