Μεταγλωττιστές 2019
Προγραμματιστική Εργασία #2

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Κανόνες της γραμματικής:

```
Stmt_List -> Stmt Stmt_List
    | empty.
Stmt -> identifier assign Expr
    | print Expr.
Expr -> Term Term_Tail.
Term_Tail -> Or Term Term_Tail
    | empty.
Term -> Factor Factor_Tail.
Factor_Tail -> Xor Factor Factor_Tail
    | empty.
Factor -> Atom Atom_Tail.
Atom_Tail -> And Atom Atom_Tail
    | empty.
Atom -> ( Expr ) | identifier | binary.
And -> and.
Xor -> xor.
Or -> or.
```

Αποτέλεσμα ελέγχου για LL(1) συμβατότητα:

```
-  All nonterminals are reachable and realizable.
-  The nullable nonterminals are: Stmt_List Term_Tail Factor_Tail
   Atom_Tail.
-  The endable nonterminals are: Atom_Tail Atom Factor_Tail Factor
   Term_Tail Term Expr Stmt_List Stmt.
-  No cycles.

   The grammar is LL(1).
```

Πίνακες με first και follow sets για όλα τα μη τερματικά σύμβολα:

nonterminal	first set	follow set
Stmt	identifier print	empty identifier print
Term_Tail	empty or	) empty identifier print
Term	(identifier binary	empty or
Factor_Tail	empty xor	empty or
Factor	(identifier binary	empty xor
Atom_Tail	empty and	empty xor
Atom	(identifier binary	empty and
Expr	(identifier binary	) empty identifier print
And	and	(identifier binary
Xor	xor	(identifier binary
Or	or	(identifier binary

Αποτελέσματα εκτέλεσης του runner.py:

Είσοδος 1:

```
a = 01010101
b = 11110000
c = (a and b) or 10101010
print c
```

Έξοδος 1:

```
11111010
```

Είσοδος 2:

```
a = 01010011
b = 10100101
print c
```

Έξοδος 2:

```
*** stacktrace redacted ***
RuntimeError: Variable c doesn't exi-
```

Είσοδος 3:

```
a = 101001010
b = 1010101010010101
c = a or b ( b and a )
```

Έξοδος 3:

```
Parse Error: Expected atom tail, got ( at line 3 char 12
```

Πηγές:

Vital Statistics, Context Free Grammar Tool, Accessed at 31/05/2019,
http://smlweb.cpsc.ucalgary.ca/start.html

6.16. Operator precedence, Python 3.7.3 Documentation, Accessed at 01/06/2019,
https://docs.python.org/3/reference/expressions.html#operator-precedence