Μεταγλωττιστές 2019
Προγραμματιστική Εργασία #2
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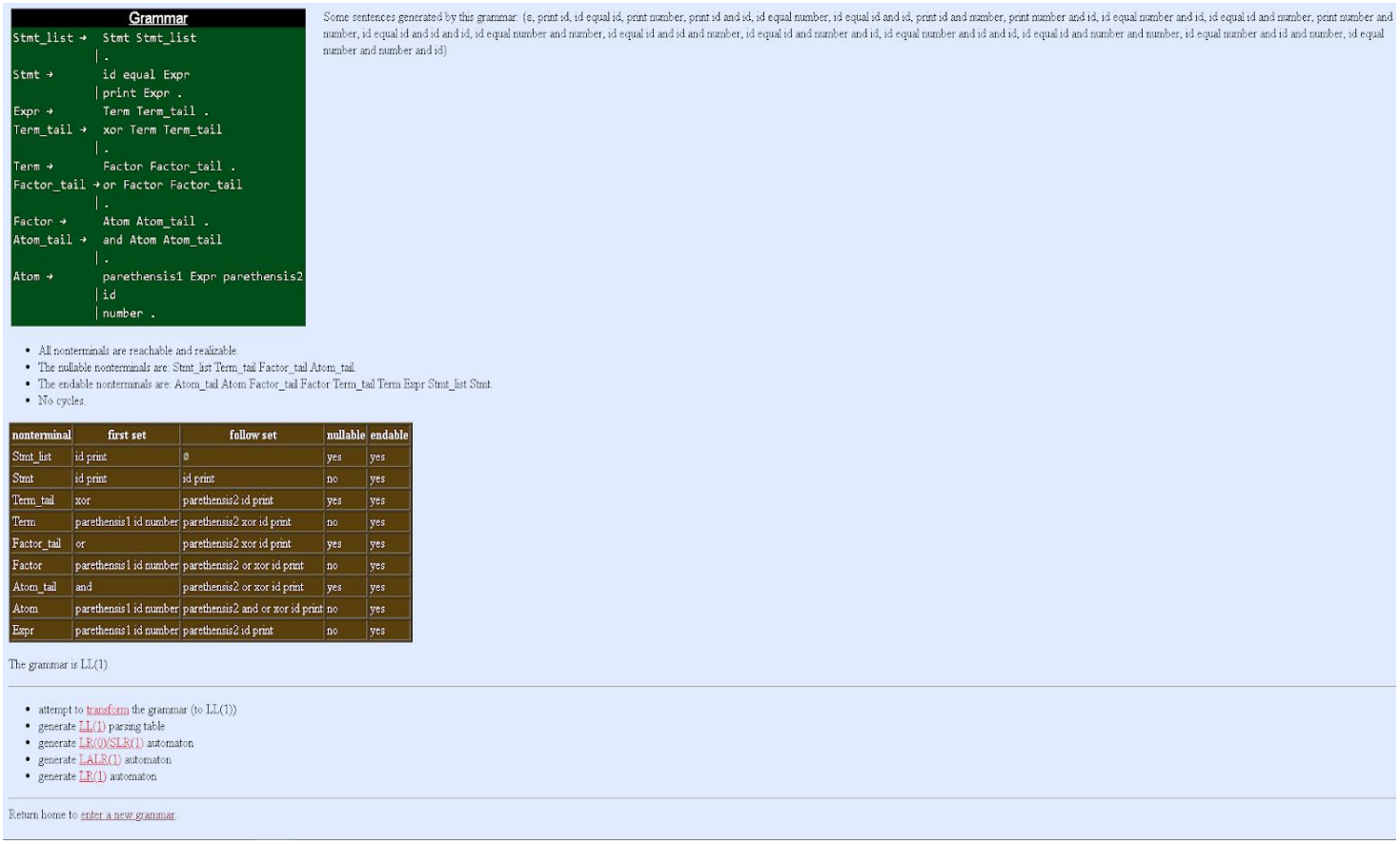
ΑΜ: Π2016148

- Κανόνες γραμματικής:

Grammar

```
Stmt_list →   Stmt Stmt_list
            | .
Stmt →        id equal Expr
            | print Expr .
Expr →        Term Term_tail .
Term_tail →   xor Term Term_tail
            | .
Term →        Factor Factor_tail .
Factor_tail →or Factor Factor_tail
            | .
Factor →      Atom Atom_tail .
Atom_tail →   and Atom Atom_tail
            | .
Atom →        parethensis1 Expr parethensis2
            | id
            | number .
```

- Αποτέλεσμα ελέγχου για LL(1) συμβατότητα:



Grammar

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Stmt_list →   Stmt Stmt_list
            | .
Stmt →        id equal Expr
            | print Expr .
Expr →        Term Term_tail .
Term_tail →   xor Term Term_tail
            | .
Term →        Factor Factor_tail .
Factor_tail → or Factor Factor_tail
            | .
Factor →      Atom Atom_tail .
Atom_tail →   and Atom Atom_tail
            | .
Atom →        parethensis1 Expr parethensis2
            | id
            | number .
```

Some sentences generated by this grammar: (ε, print id, id equal id, print number, print id and id, id equal number, id equal id and id, print id and number, print number and id, id equal number and id, id equal id and number, print number and number, id equal id and id and id, id equal number and number, id equal id and id and number, id equal id and number and id, id equal number and id and id, id equal id and number and number, id equal number and id and number, id equal number and number and id)

- 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.

nonterminal	first set	follow set	nullable	endable
Stmt_list	id print	ε	yes	yes
Stmt	id print	id print	no	yes
Term_tail	xor	parethensis2 id print	yes	yes
Term	parethensis1 id number	parethensis2 xor id print	no	yes
Factor_tail	or	parethensis2 xor id print	yes	yes
Factor	parethensis1 id number	parethensis2 or xor id print	no	yes
Atom_tail	and	parethensis2 or xor id print	yes	yes
Atom	parethensis1 id number	parethensis2 and or xor id print	no	yes
Expr	parethensis1 id number	parethensis2 id print	no	yes

The grammar is LL(1).

- attempt to transform the grammar (to LL(1))
- generate LL(1) parsing table
- generate LR(0)/SLR(1) automaton
- generate LALR(1) automaton
- generate LR(1) automaton

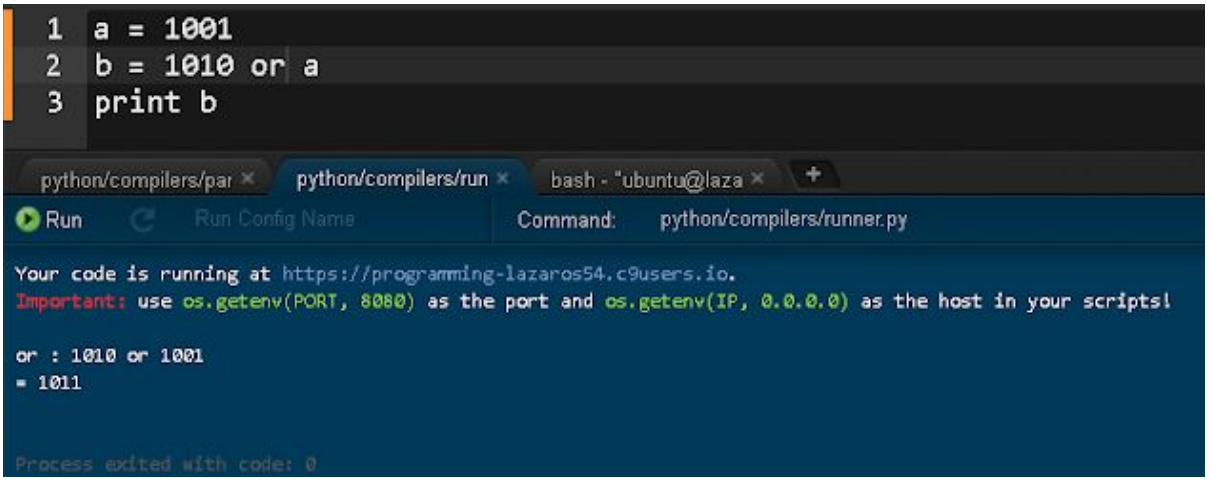
Return home to enter a new grammar.

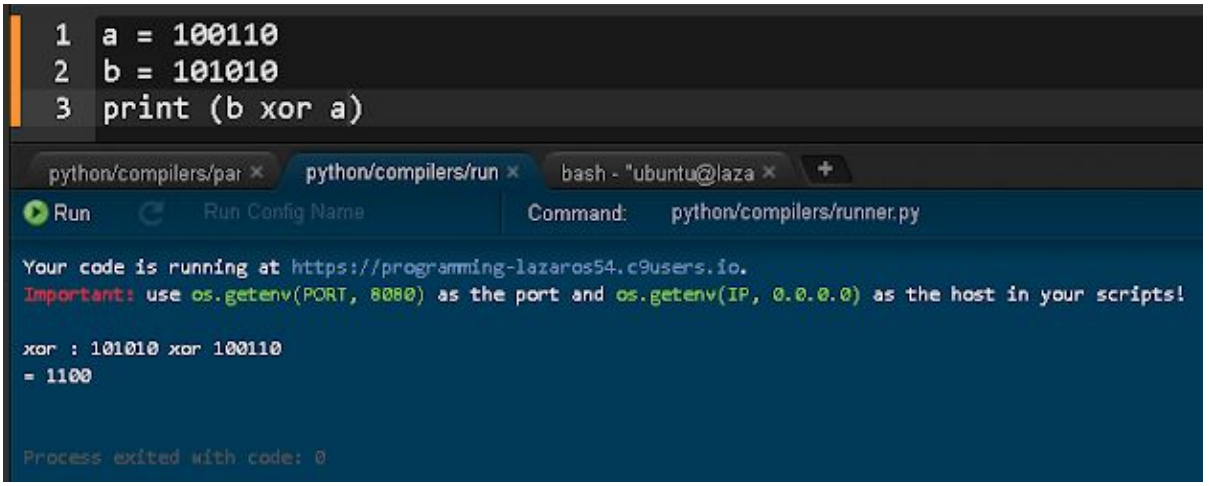
- Πίνακες με τα FIRST και FOLLOW sets:

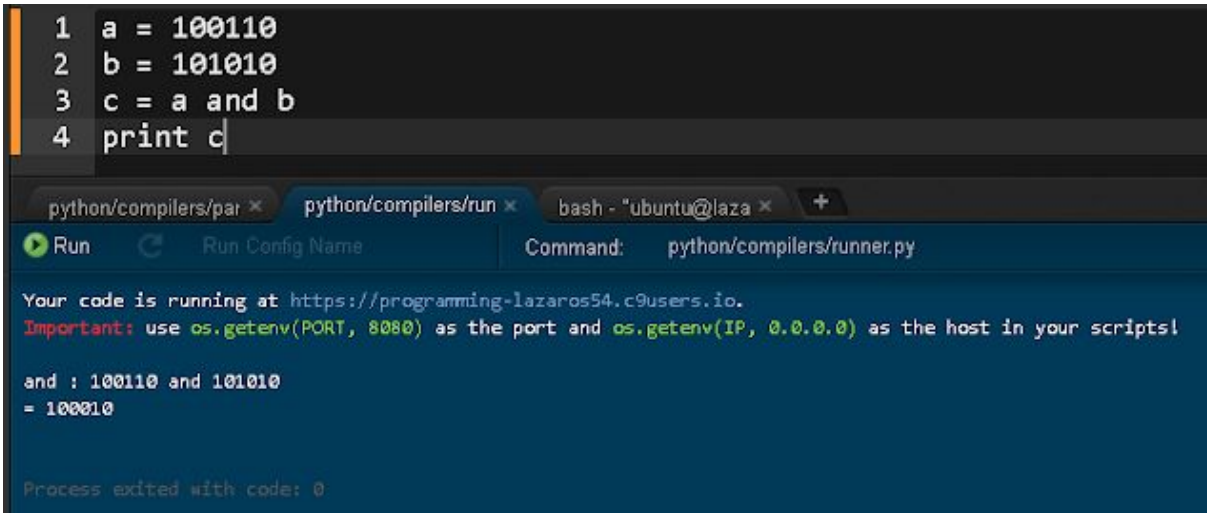
nonterminal	first set	follow set	nullable	endable
Stmt_list	id print	ε	yes	yes
Stmt	id print	id print	no	yes
Term_tail	xor	parethensis2 id print	yes	yes
Term	parethensis1 id number	parethensis2 xor id print	no	yes
Factor_tail	or	parethensis2 xor id print	yes	yes
Factor	parethensis1 id number	parethensis2 or xor id print	no	yes
Atom_tail	and	parethensis2 or xor id print	yes	yes
Atom	parethensis1 id number	parethensis2 and or xor id print	no	yes
Expr	parethensis1 id number	parethensis2 id print	no	yes

- Αποτελέσματα:

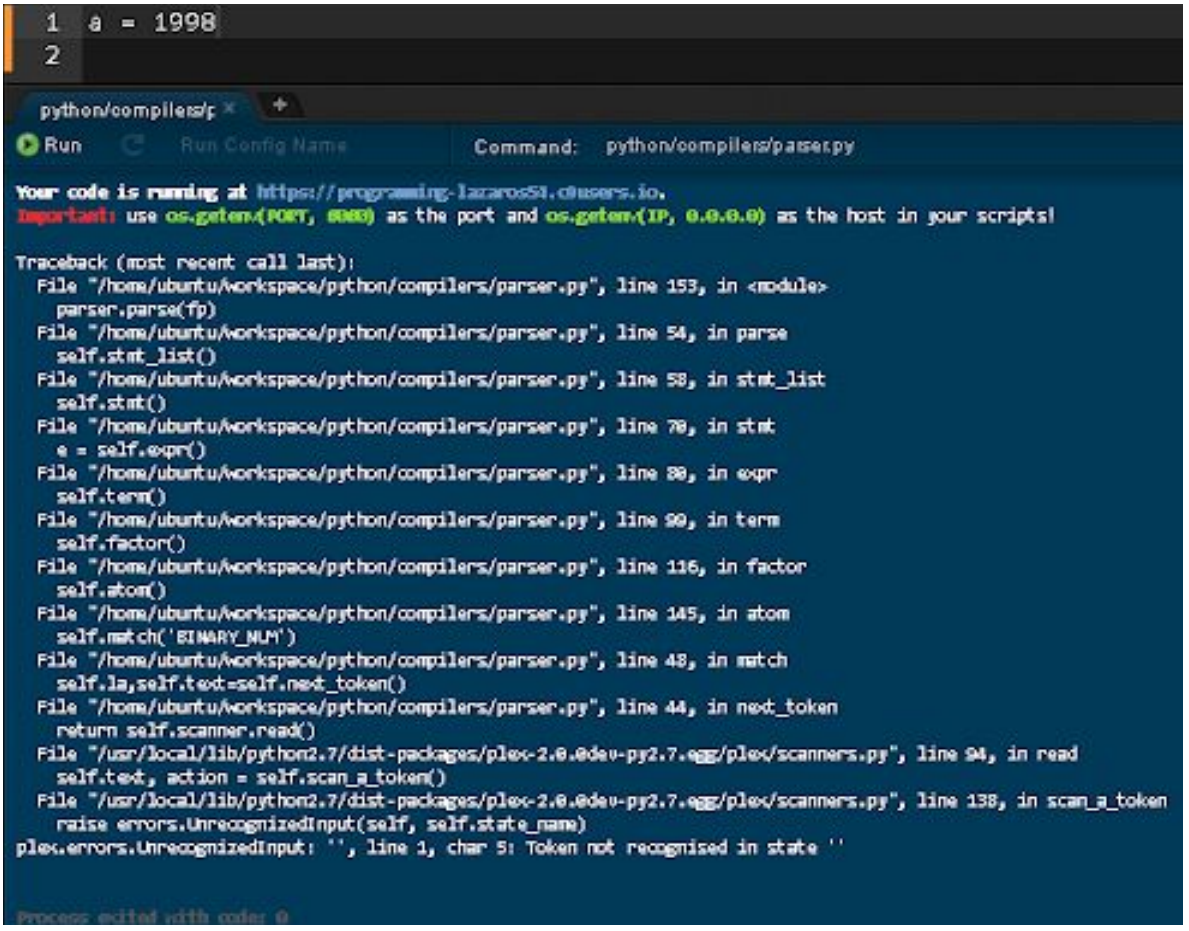
Με σωστές εισόδους:

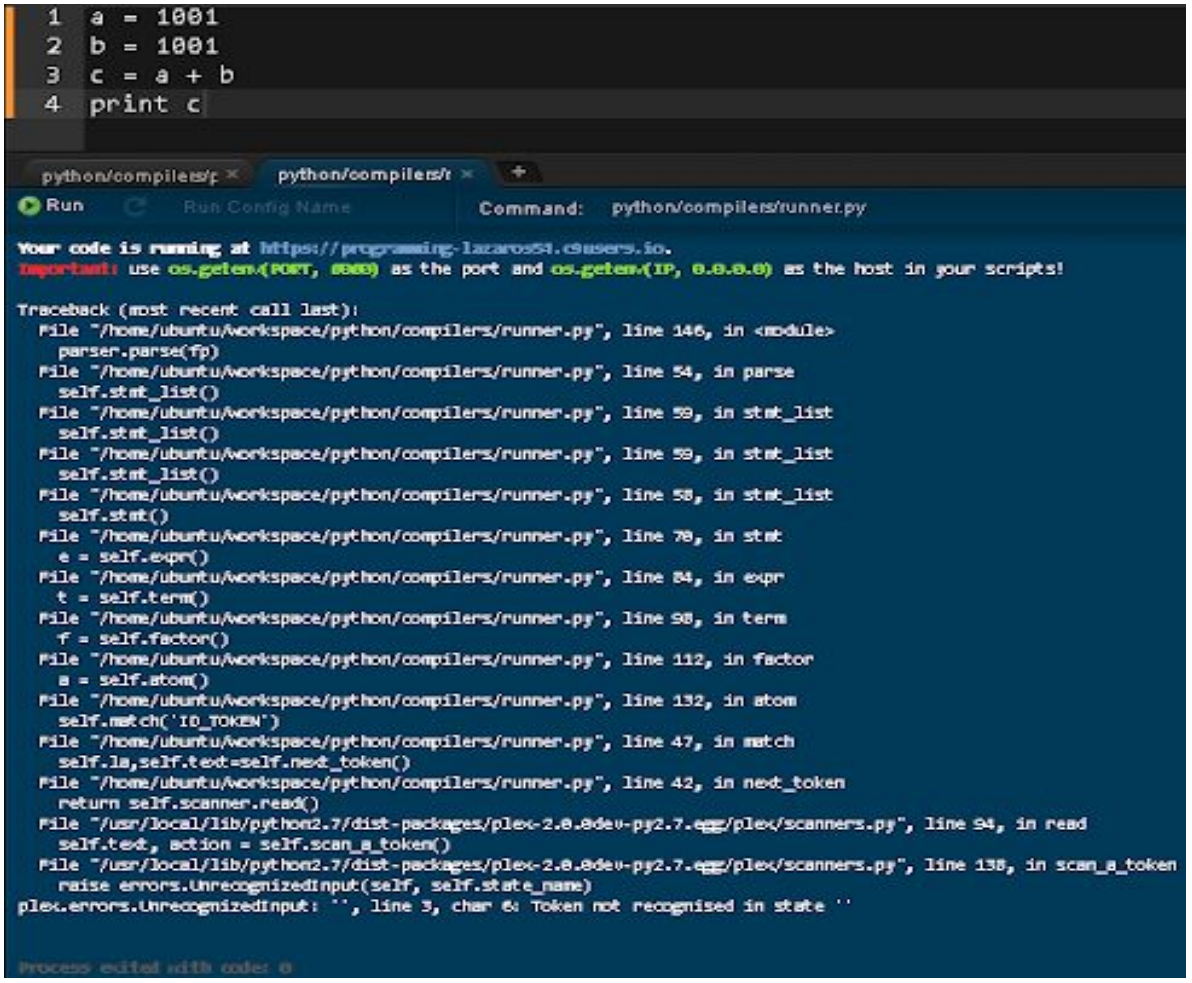






Λαθος εισοδοι:





Πηγές και σχόλια:

Χρησιμοποίησα τον κώδικα που δημιουργήσαμε κατα την διάρκεια του εξαμήνου στα εργαστήρια σαν βοήθημα όπου στη συνέχεια τον επέκτεινα σύμφωνα με την γραμματική που δημιούργησα έχοντας γνώμονα την εκφώνηση της εργασίας. Άλλες πηγές που χρησιμοποιήθηκαν ήταν κάποια link που είχε η εκφώνηση της εργασίας καθώς και το Google. Επίσης για την αναπτυξη και το τρέξιμο του κώδικα χρησιμοποιησα το cloud9.

Πηγές:

- https://c9.io/login
- http://mixstef.github.io/courses/compilers/assignment2.pdf
- http://mixstef.github.io/courses/compilers/lecturedoc/unit5/module2.html#id1
- https://gist.github.com/mixstef/946fce67f49f147991719bfa4d0101fa
- http://smlweb.cpsc.ucalgary.ca/start.html