

Μεταγλωττιστές 2019

Προγραμματιστική Εργασία #2

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A.M.: Π2016057

- Κανόνες της γραμματικής.
- Αποτέλεσμα ελέγχου για LL(1) συμβατότητα.
- Πίνακες με τα FIRST και FOLLOW sets για όλα τα μη τερματικά σύμβολα.

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 →	parenthesiL Expr parenthesiR id number .

Some sentences generated by this grammar: {ε, print, number and number, id equal id and id and id, id equal 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	∅	yes	yes
Stmt	id print	id print	no	yes
Term_tail	xor	parenthesiR id print	yes	yes
Term	parenthesiL id number	parenthesiR xor id print	no	yes
Factor_tail	or	parenthesiR xor id print	yes	yes
Factor	parenthesiL id number	parenthesiR or xor id print	no	yes
Atom_tail	and	parenthesiR or xor id print	yes	yes
Atom	parenthesiL id number	parenthesiR and or xor id print	no	yes
Expr	parenthesiL id number	parenthesiR id print	no	yes

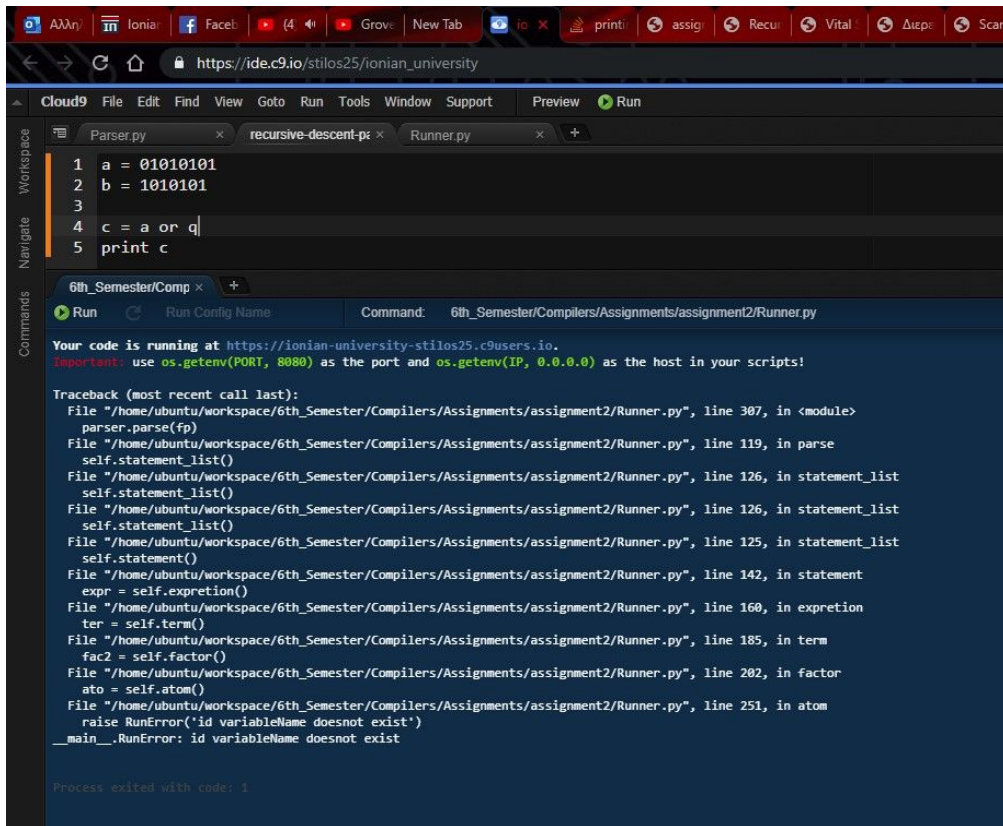
The grammar is LL(1).

- 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](#).

Εφτιαξα την γραμματική, μετά τροποποίησα τον κώδικα που μας δώσατε συν εργαστηριακό κώδικα (<https://ide.c9.io>) με βάση την γραμματική και τα first and follow set.

- Αποτελέσματα εξόδου για έγκυρες και άκυρες μορφές εισόδου.



The screenshot shows the Cloud9 IDE interface. The top bar includes navigation icons and the URL https://ide.c9.io/stilos25/ionian_university. The workspace contains three files: `Parser.py`, `recursive-descent-p`, and `Runner.py`. The `Runner.py` file is open, showing the following code:

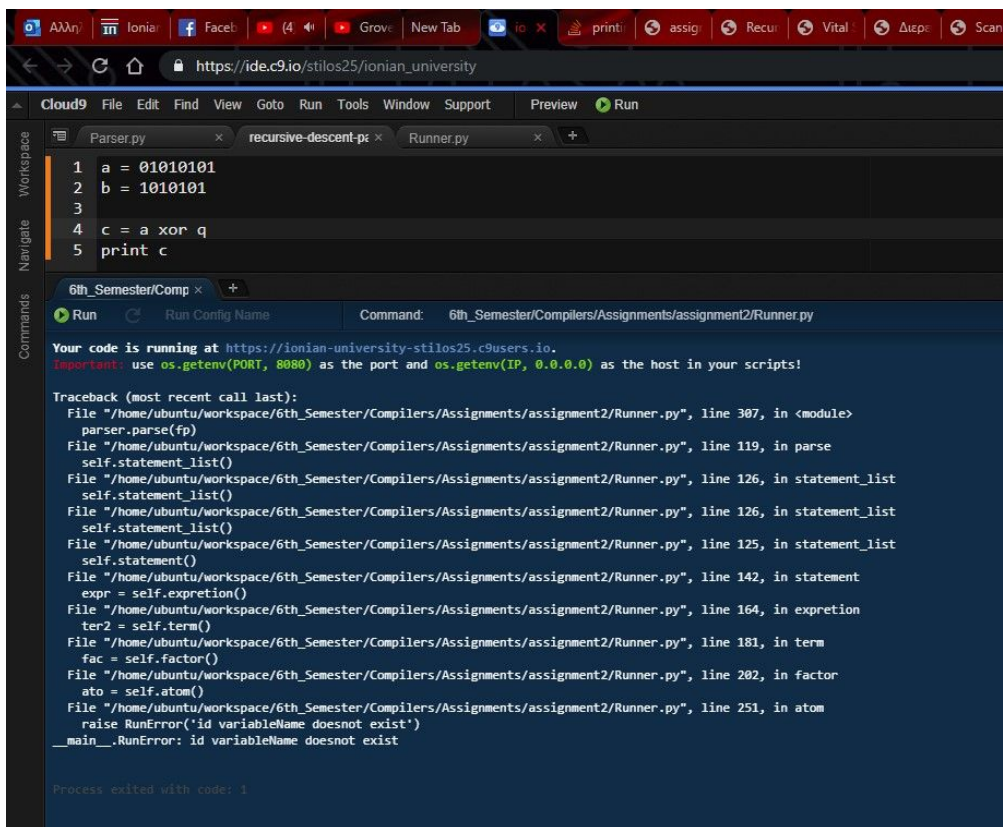
```
1 a = 01010101
2 b = 1010101
3
4 c = a or q
5 print c
```

The command bar shows the command: `6th_Semester/Compilers/Assignments/assignment2/Runner.py`. The output pane displays the following message:

Your code is running at <https://ionian-university-stilos25.c9users.io>.
Important: use `os.getenv(PORT, 8080)` as the port and `os.getenv(IP, 0.0.0.0)` as the host in your scripts!

Traceback (most recent call last):
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 307, in `<module>`
parser.parse(fp)
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 119, in `parse`
self.statement_list()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 126, in `statement_list`
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File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 125, in `statement_list`
self.statement()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 142, in `statement`
expr = self.expretion()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 160, in `expretion`
ter = self.term()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 185, in `term`
fac2 = self.factor()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 202, in `factor`
ato = self.atom()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 251, in `atom`
raise RuntimeError('id variableName doesnot exist')
__main__.RunError: id variableName doesnot exist

Process exited with code: 1



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4 c = a xor q
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raise RuntimeError('id variableName doesnot exist')
__main__.RunError: id variableName doesnot exist

Process exited with code: 1

The screenshot shows the Cloud9 IDE interface. The top toolbar includes 'File', 'Edit', 'Find', 'View', 'Goto', 'Run', 'Tools', 'Window', 'Support', 'Preview', and 'Run'. The workspace contains three files: 'Parser.py', 'recursive-descent-p', and 'Runner.py'. The 'Runner.py' file is open, showing the following code:

```
1 a = 01010101
2 b = 1010101
3 |
4 c = a and q
5 print c
```

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File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 206, in `factor`
 ato2 = self.atom()
File `"/home/ubuntu/workspace/6th_Semester/Compilers/Assignments/assignment2/Runner.py"`, line 251, in `atom`
 raise RuntimeError('id variableName doesnot exist')
main.RuntimeError: id variableName doesnot exist

Process exited with code: 1

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```
1 a = 01010101
2 b = 1010101
3 |
4 c = ((a xor b) or a) and b |
5 print c
```

The command bar shows the command: `6th_Semester/Compilers/Assignments/assignment2/Runner.py`. The output pane displays the following message:

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| 1010101 xor 1010101 | 0 or 1010101 | 1010101 and 1010101 = 1010101

Process exited with code: 0

- **Αναφορά σε πηγές που πιθανόν χρησιμοποιήσατε**

<http://mixstef.github.io/courses/compilers/assignment2.pdf>

<http://mixstef.github.io/courses/compilers/lecturedoc/unit5/module2.html>

<http://smlweb.cpsc.ucalgary.ca/start.html>

<https://gist.github.com/mixstef/946fce67f49f147991719bfa4d0101fa>

<http://lefkimi.ionio.gr/~mistral/tp/compilers/lecturedoc/unit4/module1.html>

<https://ide.c9.io>

<https://stackoverflow.com>