

Μεταγλωττιστές 2019

Εργασία 2

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Κανόνες Γραμματικής:

```
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 → (Expr)|id|binary_num.
```

Αποτελέσματα ελέγχου συμβατότητας για LL(1):

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 →       (Expr)
           | binary_num
           | id .
```

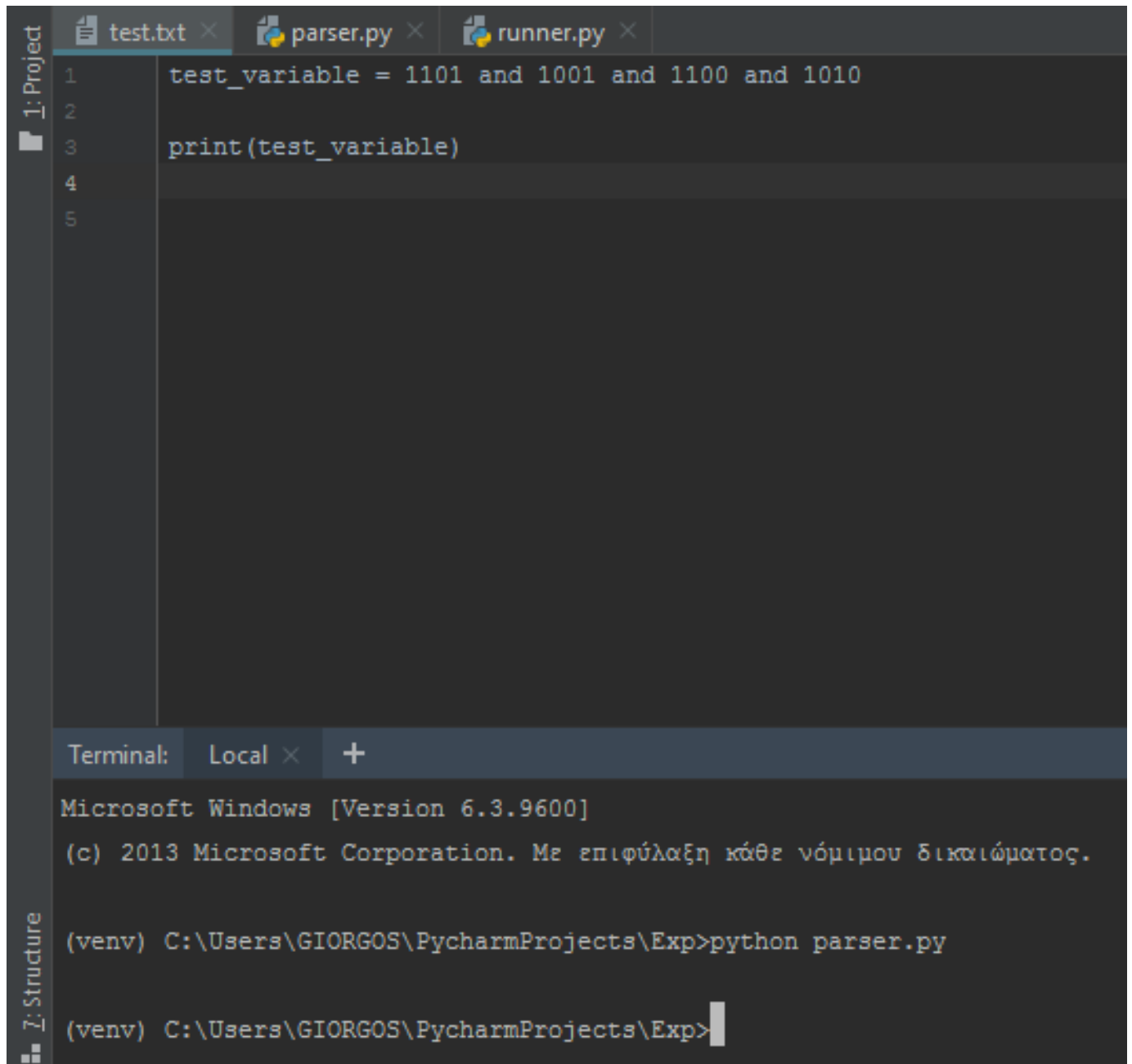
First Follow Set για μη τερματικά σύμβολα:

nonterminal	first set	follow set	nullable	endable
Stmt_list	id print	\emptyset	yes	yes
Stmt	id print	id print	no	yes
Expr	(Expr) binary_num id	id print	no	yes
Term_Tail	xor	\emptyset	yes	no
Term_tail	\emptyset	id print	no	yes
Term	(Expr) binary_num id	\emptyset	no	no
Factor_tail	or	\emptyset	yes	no
Factor	(Expr) binary_num id	or	no	no
Atom_tail	and	or	yes	no
Atom	(Expr) binary_num id	and or	no	no

The grammar is LL(1).

Αποτελέσματα εξόδου parser.py:

- Ορθό

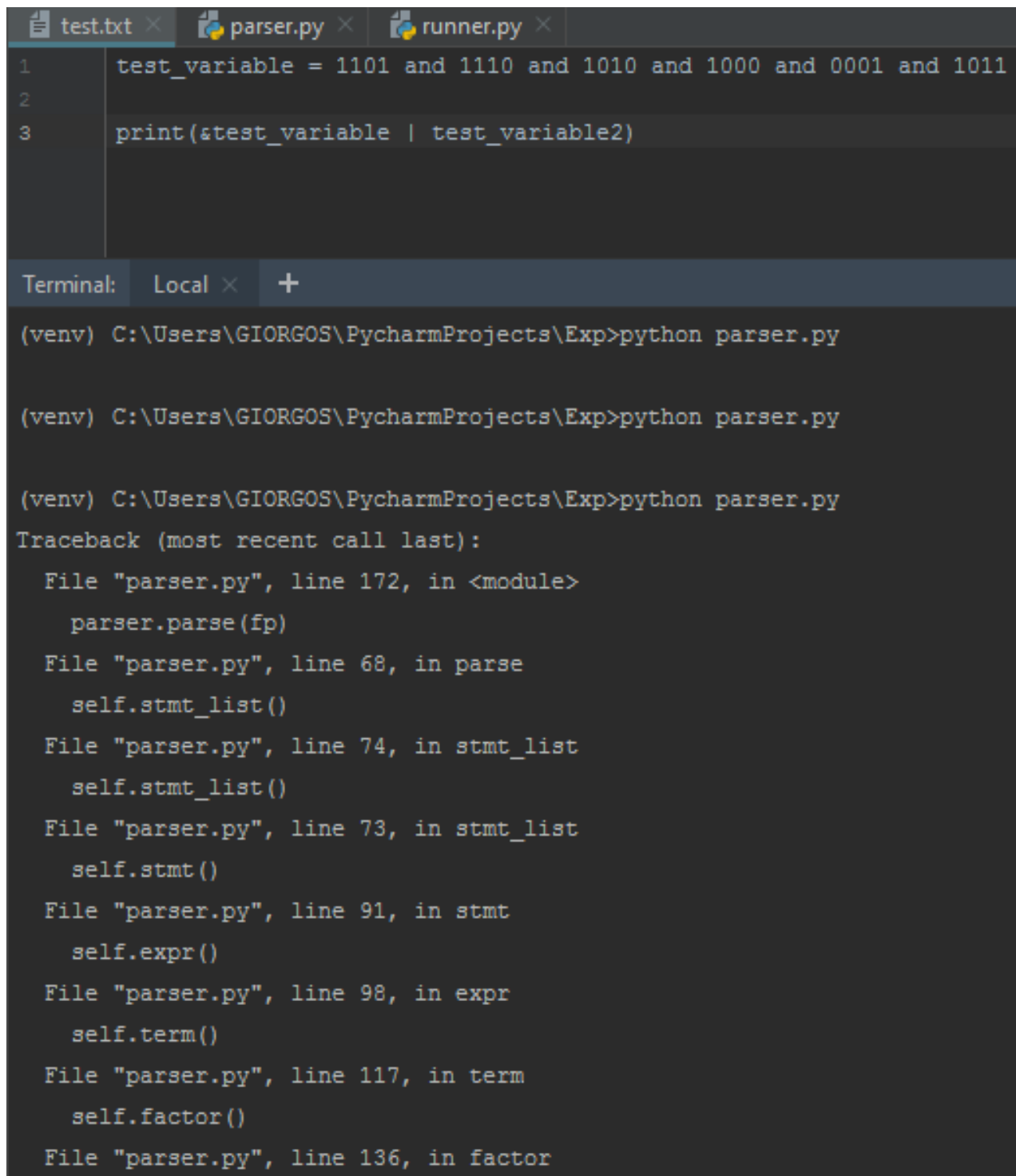


The screenshot shows the PyCharm IDE interface. The top toolbar contains three tabs: 'test.txt', 'parser.py', and 'runner.py'. The 'test.txt' tab is active, displaying a Python script with the following code:

```
1 test_variable = 1101 and 1001 and 1100 and 1010
2
3 print(test_variable)
4
5
```

The bottom toolbar shows the 'Terminal' tab, which is active. It displays the output of the command 'python parser.py' executed in a virtual environment (venv) at the path 'C:\Users\GIORGOS\PycharmProjects\Exp'. The output shows the Microsoft Windows version (6.3.9600) and the copyright notice for 2013 Microsoft Corporation. The command prompt shows the command 'python parser.py' and the resulting output '1101 and 1001 and 1100 and 1010'.

- Λανθασμένο



The screenshot shows a PyCharm IDE with three tabs: test.txt, parser.py, and runner.py. The test.txt tab is active, showing the following code:

```
1 test_variable = 1101 and 1110 and 1010 and 1000 and 0001 and 1011
2
3 print(test_variable | test_variable2)
```

Below the code editor is a terminal window with the following output:

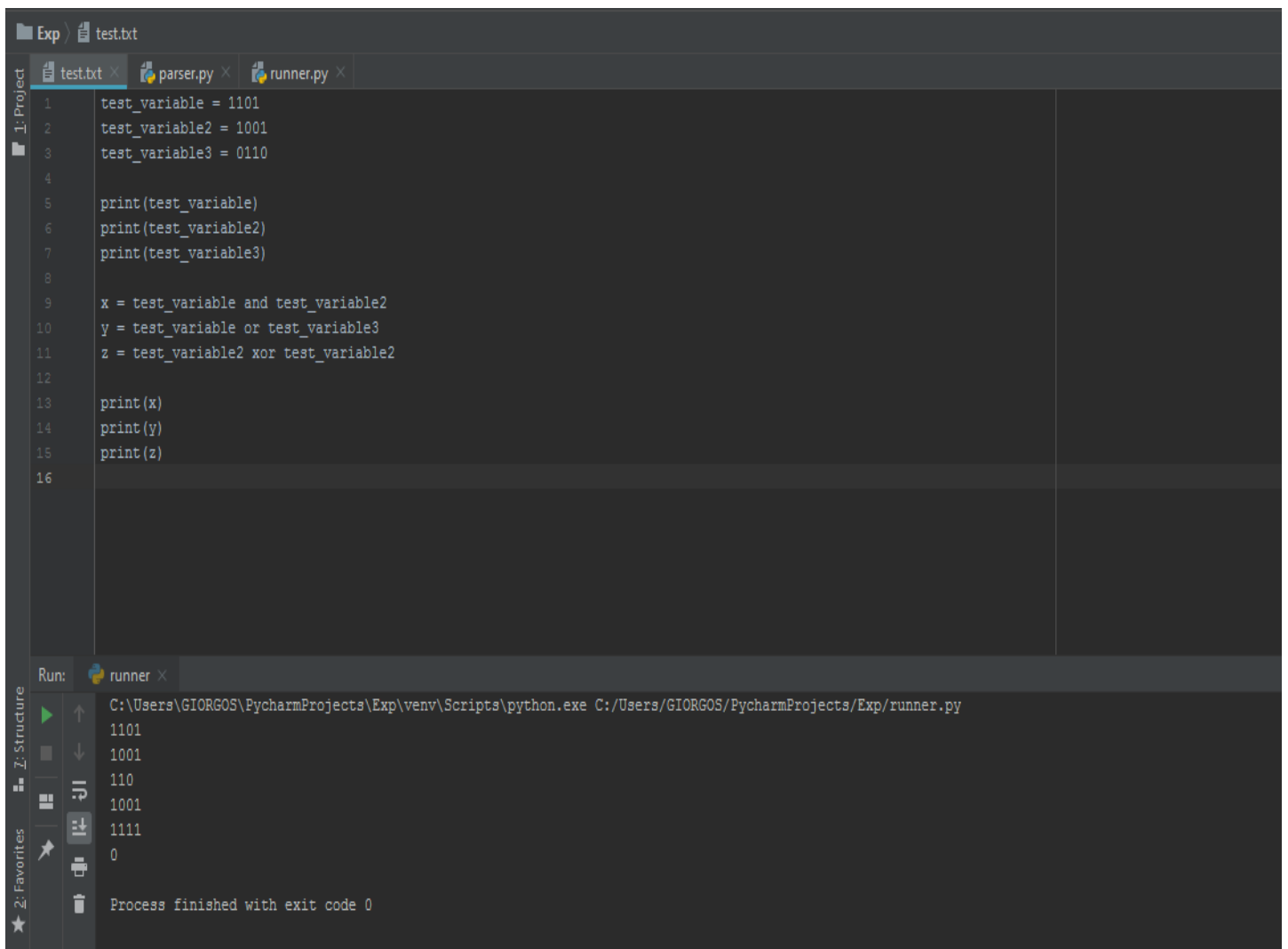
```
Terminal: Local x +
(venv) C:\Users\GIORGOS\PycharmProjects\Exp>python parser.py

(venv) C:\Users\GIORGOS\PycharmProjects\Exp>python parser.py

(venv) C:\Users\GIORGOS\PycharmProjects\Exp>python parser.py
Traceback (most recent call last):
  File "parser.py", line 172, in <module>
    parser.parse(fp)
  File "parser.py", line 68, in parse
    self.stmt_list()
  File "parser.py", line 74, in stmt_list
    self.stmt_list()
  File "parser.py", line 73, in stmt_list
    self.stmt()
  File "parser.py", line 91, in stmt
    self.expr()
  File "parser.py", line 98, in expr
    self.term()
  File "parser.py", line 117, in term
    self.factor()
  File "parser.py", line 136, in factor
```

Αποτελέσματα απο runner.py:

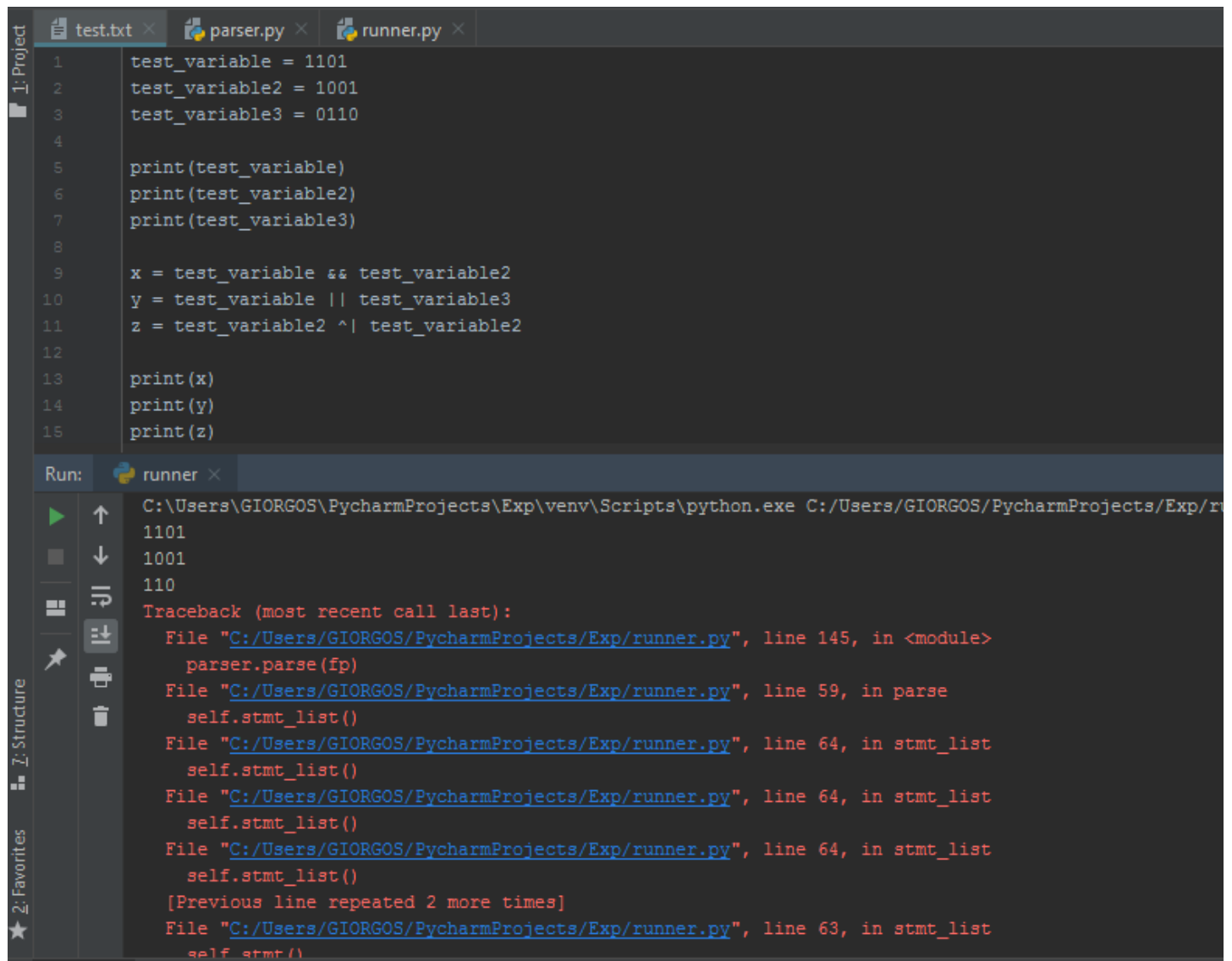
- Ορθό



```
Exp > test.txt
test.txt x parser.py x runner.py x
1: test_variable = 1101
2: test_variable2 = 1001
3: test_variable3 = 0110
4:
5: print(test_variable)
6: print(test_variable2)
7: print(test_variable3)
8:
9: x = test_variable and test_variable2
10: y = test_variable or test_variable3
11: z = test_variable2 xor test_variable2
12:
13: print(x)
14: print(y)
15: print(z)
16:

Run: runner x
C:\Users\GIORGOS\PycharmProjects\Exp\venv\Scripts\python.exe C:/Users/GIORGOS/PycharmProjects/Exp/runner.py
1101
1001
110
1001
1111
0
Process finished with exit code 0
```

- Λανθασμένο



```
1 test_variable = 1101
2 test_variable2 = 1001
3 test_variable3 = 0110
4
5 print(test_variable)
6 print(test_variable2)
7 print(test_variable3)
8
9 x = test_variable && test_variable2
10 y = test_variable || test_variable3
11 z = test_variable2 ^| test_variable2
12
13 print(x)
14 print(y)
15 print(z)
```

Run: runner ×

C:\Users\GIORGOS\PycharmProjects\Exp\venv\Scripts\python.exe C:/Users/GIORGOS/PycharmProjects/Exp/r
1101
1001
110
Traceback (most recent call last):
File "C:/Users/GIORGOS/PycharmProjects/Exp/runner.py", line 145, in <module>
 parser.parse(fp)
File "C:/Users/GIORGOS/PycharmProjects/Exp/runner.py", line 59, in parse
 self.stmt_list()
File "C:/Users/GIORGOS/PycharmProjects/Exp/runner.py", line 64, in stmt_list
 self.stmt_list()
File "C:/Users/GIORGOS/PycharmProjects/Exp/runner.py", line 64, in stmt_list
 self.stmt_list()
File "C:/Users/GIORGOS/PycharmProjects/Exp/runner.py", line 64, in stmt_list
 self.stmt_list()
[Previous line repeated 2 more times]
File "C:/Users/GIORGOS/PycharmProjects/Exp/runner.py", line 63, in stmt_list
 self.stmt()