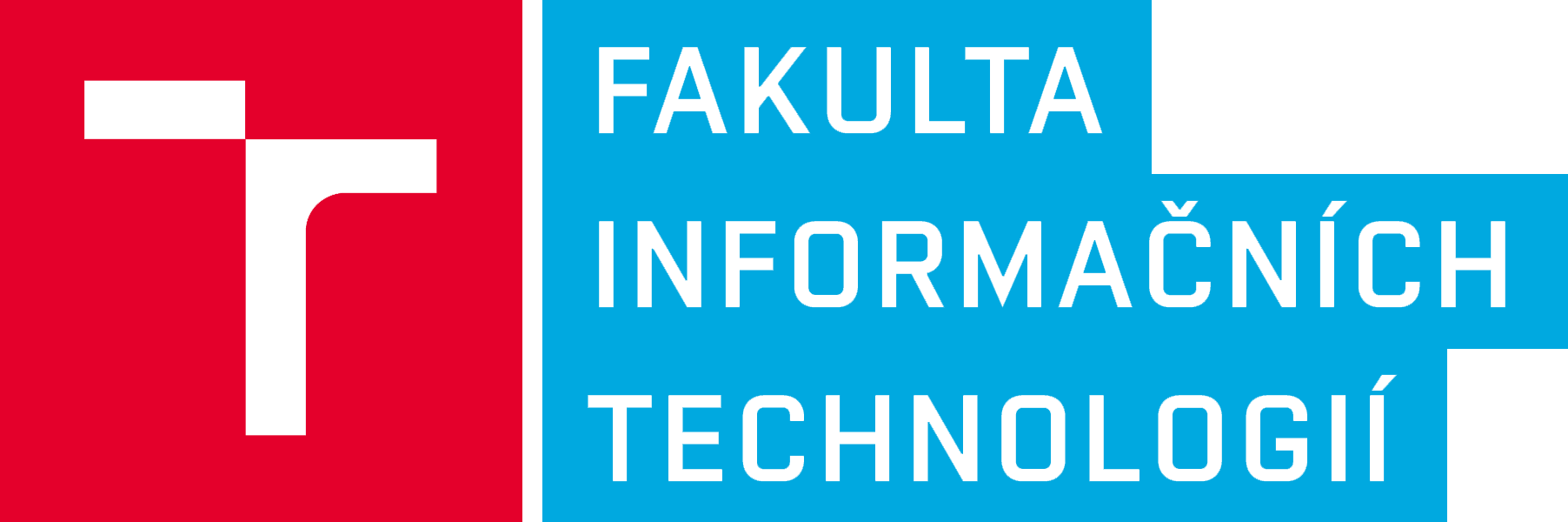
Faculty of information technology

Brno University of Technology



Documentation to the project for the IFJ and IAL courses

**Implementation of the compiler of the IFJ18 programming language**

Team 037, variant I.

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# **Teamwork**

# **Implementation**

# **Conclusion**

# **Sources**

# **Attachments**

**Attachment 1: Finite-state automata**

**Obrázok, na ktorom je text, mapa

Popis sa automaticky vygeneroval**

**Attachment 2: LL grammar**

1. <start> → <function> <st-list>
2. <function> → ‘def’ <function-head> <st-list> <function-tail> <function>
3. <function> → ε
4. <function-head> → <function-id> ‘(’ <par> ‘)’ ‘EOL’
5. <function-tail> → ‘end’ ‘EOL’
6. <par> → <id> <next-par>
7. <par> → ε
8. <next-par> → ‘,’ <par>
9. <next-par> → ε
10. <st-list> → <stat> ‘EOL’ <st-list>
11. <st-list> → ‘EOL’<st-list>
12. <st-list> → ε
13. <stat> → <id> <eval>
14. <eval> → ε
15. <eval> → ‘=’ <assign>
16. <assign> → <expr>
17. <assign> → <function-id> <f-params>
18. <stat> → ‘if’ <expr> ‘then’ ‘EOL’ <st-list> ‘else’ ‘EOL’ <st-list> ‘end’
19. <stat> → ‘while’ <expr> ‘do’ ‘EOL’ <st-list> ‘end’
20. <stat> → ‘print’ <print-expr>
21. <print-expr> → ‘(‘ <print-expr>‘)’
22. <print-expr> → <expr> <next-print-expr>
23. <print-expr> → ε
24. <next-print-expr> → ‘,’ <print-expr>
25. <stat> → <function-id> <f-params>
26. <f-params> → ‘(‘ <f-param> ‘)’
27. <f-params> → <id> <next-f-param>
28. <f-params> → ε
29. <next-f-params> → ‘,’ <f-params>
30. <next-f-params> → ε

**Attachment 3: LL parsing table**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **<start>** | **<function>** | **<function-head>** | **<function-tail>** | **<par>** | **<next-par>** | **<st-list>** | **<stat>** | **<eval>** | **<assign>** | **<print-expr>** | **<next-print-expr>** | **<f-params>** | **<next-f-params>** |
| **def** | 1 | 2 |  |  |  |  | 1 |  |  |  |  |  |  |  |
| **EOL** | 1 | 3 |  |  |  | 9 | 11 |  | 14 |  | 23 | 23 | 28 | 28 |
| **end** |  |  |  | 5 |  |  | 12 |  |  |  |  |  |  |  |
| **,** |  |  |  |  |  | 8 |  |  |  |  | 24 | 24 | 29 | 29 |
| **'=’** |  |  |  |  |  |  |  |  | 15 |  |  |  |  |  |
| **id** | 1 | 3 | 4 |  | 6 |  | 10 | 13 |  | 16 | 22 | 22 | 27 | 27 |
| **expr** |  |  |  |  |  |  |  |  |  | 16 | 22 | 22 | 27 | 27 |
| **(** |  |  |  |  |  |  |  |  |  | 16 | 21 |  | 26 |  |
| **)** |  |  |  |  | 7 | 7 |  |  |  |  | 23 | 23 | 28 | 30 |
| **if** | 1 | 3 |  |  |  |  | 10 | 18 |  |  |  |  |  |  |
| **then** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **else** |  |  |  |  |  |  | 12 |  |  |  |  |  |  |  |
| **while** | 1 | 3 |  |  |  |  | 10 | 19 |  |  |  |  |  |  |
| **do** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Function-id** | 1 | 3 | 4 |  |  |  | 10 | 25 |  | 17 |  |  |  |  |
| **$** |  | 3 |  |  |  | 9 | 12 |  | 14 |  | 23 | 23 | 28 | 28 |
| **print** |  |  |  |  |  |  | 10 | 20 |  | 17 |  |  |  |  |

**Attachment 4: Precedence table**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **+** | **-** | **\*** | **/** | **<** | **<=** | **>** | **>=** | **'==’** | **!=** | **(** | **)** | **I** | **$** |
| **+** | > | > | < | < | > | > | > | > | > | > | < | > | < | > |
| **-** | > | > | < | < | > | > | > | > | > | > | < | > | < | > |
| **\*** | > | > | > | > | > | > | > | > | > | > | < | > | < | > |
| **/** | > | > | > | > | > | > | > | > | > | > | < | > | < | > |
| **<** | < | < | < | < | '=’ | '=’ | '=’ | '=’ | > | > | < | > | < | > |
| **<=** | < | < | < | < | '=’ | '=’ | '=’ | '=’ | > | > | < | > | < | > |
| **>** | < | < | < | < | '=’ | '=’ | '=’ | '=’ | > | > | < | > | < | > |
| **>=** | < | < | < | < | '=’ | '=’ | '=’ | '=’ | > | > | < | > | < | > |
| **'==’** | < | < | < | < | < | < | < | < | '=’ | '=’ | < | > | < | > |
| **!=** | < | < | < | < | < | < | < | < | '=’ | '=’ | < | > | < | > |
| **(** | < | < | < | < | < | < | < | < | < | < | < | '=’ | < | E |
| **)** | > | > | > | > | > | > | > | > | > | > | E | > | E | > |
| **I** | > | > | > | > | > | > | > | > | > | > | E | > | E | > |
| **$** | < | < | < | < | < | < | < | < | < | < | < | E | < | E |