



**FACULTY
OF MATHEMATICS
AND PHYSICS**
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High Level Assembler Plugin

Detailed Specification

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Introduction

Related Work

1. IBM High Level Assembler

Language overview

In general, high-level assemblers provide for their assembly languages features that are commonly found in high-level programming languages. Hence, in addition to ordinary machine instructions they also contain control statements similar to *if*, *while*, *for* as well as custom callable macros.

IBM High Level Assembler (HLASM) comforts this definition and adds other features which will be described in this chapter.

1.1 Syntax

HLASM has somehow complicated syntax.

1.1.1 Statement

HLASM program is sequence of *statements*. Statement consists of four fields. Those are:

- **Name field** — Serves as place for named constants that are to be used in code.
- **Operation field** — Instruction that is executed.
- **Operands field** — Field for instruction operands separated by comma.
- **Remark field** — Serves as line commentary.

label	instruction	operands	remarks
.NOMOV	AGO	(&WH).L1,.L2,.L3	SEQUENTIAL BRANCH

1.1.2 Continuation

One line in HLASM source code can contain only up to 80 characters. However, sometimes statement is too long to be written in one line. Therefore, special handling is introduced called **continuation**.

For indication that statement continues on the next line a character other than space is placed in **continuation column** (default is 72). Then the remainder of the statement must start on **continue column** (default is 15) to finally create a well formed statement (see 1.1).

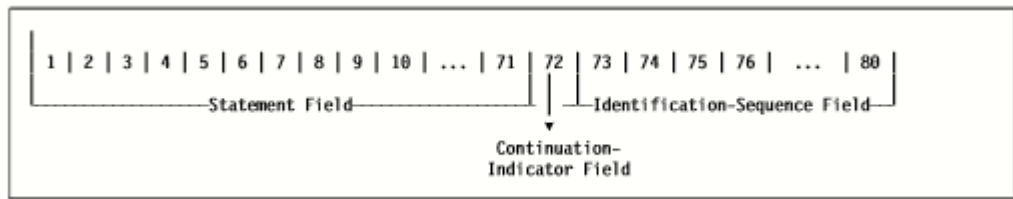


Figure 1.1: Description of line columns.

1.2 Semantics

1.2.1 Conditional assembly

1.2.2 Ordinary assembly

2. Requirements

-co ten nas produkt ma byt vseobecne zhrnutie

...je to extension ... doda support pre ... -cela tato sekcia uz je popisana niekde na CA wiki, mozno dobry zaklad

2.1 Language features

-zoznam veci jazyka co podporujeme

2.2 LSP features

-working plugin for vs code

- Go to definition for all symbols, macro definitions and copy members.
- Find all references
- Completion for instructions, defined symbols and macros
- Highlighting
- Hover

-non functional requirement - api kniznice??

3. Architecture

-JNI? asi by som nespominal

mirko:

a je fajn rozepsat vsechny API a takovy veci co sou po ceste

–velky graf vsetkych komponent –ku kazdemu odstavcek

3.1 Parser library

3.1.1 Workspace manager

3.1.2 Analyzer

Lexer

Parser

Processing

Checking

3.1.3 Debugger

3.2 Language server

3.3 VS code client

4. Technologies

mirko: soupis konkrétních technologií a verzí antlr cmake jenkins json lib
boost asio? docker

vscode theia che produkce zdrojaky poskytnute broadcom google test

–jenkins sa opytat ako s tym ze to nie je nase

jazyky typescript c++ cmake

5. Project execution

mirko:

- milestony

- gantt

- prirazeni lidi k projektum

- udelejte si cas na psani dokumentace

je fajn mit contingency plan, co delat kdyz se to dojebe nebo ltery ficury
jsou jak prioritni

1. mesiac research jazyk 8t research zvolit parser 4t research zvolit ide 4t

2. mesiac implementacia LSP POC VSCode klient POC lexer 6 parser 8t

cmake 1t

3. mesiac do klienta semanticky highlighting assembler checker conditional assembly instructions expressions debugger POC

4. mesiac CA LSP features machine instruction checker 12t macro expansion

5. copy 4t machine expression 4t client-server continuation handling

6. DC ordinary 8t diagnostikz

7. ORDINARY LSP features code coverage 8t

8. benchmark testing 8t

9. dokumentacia

