APSIL Language Specification
Version 1.0

kmurali@nitc.ac.in
NIT Calicut

February 20, 2012

Contents

1 Introduction

APSIL or *Application Programmer's Simple Integer Language* is a simple and strongly typed programming language. The features and constructs of this language are minimal and mainly intended for testing an experimental operating system. The compiler of APSIL runs on ESIM (*Extended Simple Integer Machine*) architecture.

This document describes the syntax, semantics and constructs of APSIL in detail. The structure of APSIL is similar in many aspects to programming languages like C and Java.

2 General Program Structure

A typical APSIL program is orgnaized in the following way.

```
Global Declarations
.
.
Function Definitions
.
.
Main Function
```

3 Lexical Elements

3.1 Comments and White Spaces

APSIL allows only line comments. Line comments start with the character sequence // and stop at the end of the line. White spaces in the program including tabs, newline and horizontal spaces are ignored.

3.2 Keywords

The following are the reserved words in APSIL and it cannot be used as identifiers.

```
 read    write     if       then     else    endif
 while    do    endwhile  integer   string    main
return   and       or       not      decl   enddecl
 begin   end     Create     Open     Write    Seek
 Read   Close    Delete     Fork     Exec     Exit
```

3.3 Operators and Delimiters

The following are the operators and delimiters in APSIL

```
(   )   {   }   [    ] /    *    +    -   %   ;
>   <   >=  <=  !=   == and  or   not
```

3.4 Indentifiers

Identifiers are names of variables and user-defined functions. Identifiers should start with an alphabet, and may contain both alphabets and digits. Special characters are not allowed in identifiers.

```
identifier -> (alphabet)(alphabet | digit)*
```

3.5 Literals

There are integer literals and string literals in APSIL. An integer literal is a sequence of digits representing an integer. Negative integers are represented with a negative sign preceding the sequence of digits. Any sequence of characters enclosed within double quotes (") are considered as string literals. However APSIL restricts string literals to size of atmost 16 characters.

Examples of literals are `19, -35, "Hello World"`

4 Data Types

4.1 Primitive Types

There are two primitive data types in APSIL.

1. **Integer** : An integer value can range from -32767 to +32768. An integer type variable is declared using the keyword `integer`
2. **String** A string type represents the set of string values. A string value can be atmost 16 characters long. String type variables is declared using the keyword `string`.