

ISO/IEC 14977 : 1996(E)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 14977 was prepared by BSI (as BS 6154) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, Information technology, in parallel with its approval by national bodies of ISO and IEC.

Annexes A and B of this International Standard are for information only.

Introduction

A syntactic metalanguage is an important tool of computer science. The concepts are well known, but many slightly different notations are in use. As a result syntactic metalanguages are still not widely used and understood, and the advantages of rigorous notations are unappreciated by many people.

Extended BNF brings some order to the formal definition of a syntax and will be useful not just for the definition of programming languages, but for many other formal definitions.

Since the definition of the programming language Algol 60 (Naur, 1960) the custom has been to define the syntax of a programming language formally. Algol 60 was defined with a notation now known as BNF or Backus-Naur Form. This notation has proved a suitable basis for subsequent languages but has frequently been extended or slightly altered. The many different notations are confusing and have prevented the advantages of formal unambiguous definitions from being widely appreciated. The syntactic metalanguage Extended BNF described in this standard is based on Backus-Naur Form and includes the most widely adopted extensions.

Syntactic metalanguages

A syntactic metalanguage is a notation for defining the syntax of a language by use of a number of rules. Each rule names part of the language (called a non-terminal symbol of the language) and then defines its possible forms. A terminal symbol of the language is an atom that cannot be split into smaller components of the language. A syntactic metalanguage is useful whenever a clear formal description and definition is required, e.g. the format for references in papers submitted to a journal, or the instructions for performing a complicated task.

A formal syntax definition has three distinct uses:

- a) it names the various syntactic parts (i.e. non-terminal symbols) of the language;
- b) it shows which sequences of symbols are valid sentences of the language;
- c) it shows the syntactic structure of any sentence of the language.