

ЯЗЫКИ ПРОГРАММИРОВАНИЯ – ЯЗЫК PASCAL

Kozlova V.V., Karpushina A.P, Sinichkina D.S., Shelkovnikova S.V.
Козлова В.В., Карпушина А.П., Синичкина Д. С., Шелковникова С.В.
Донской государственный технический университет

Аннотация: Данная статья посвящена одному из распространенных языков программирования. В данной статье мы рассмотрим, почему именно язык Паскаль изучается в школах, а так же познакомимся со структурой языка.

Ключевые слова: Pascal, структура языка, синтаксис, семантика.

PROGRAMMING LANGUAGES – THE PASCAL LANGUAGE

Abstract: This article is devoted to one of the languages of common programming languages. In this article we will consider why Pascal is studied in schools, and also get acquainted with the structure of the language.

Keyword: Pascal, language structure, syntax, semantics.

There is a huge number of programming languages. Among them there are dozens of the most famous and used ones in some periods of computer history. This group of widely used languages includes the Pascal programming language. The Pascal language was developed in 1970 by N. Wirth as a language providing strict typing and intuitive syntax. It was named after the French mathematician, physicist and philosopher Blaise Pascal.

One of the goals of creating the Pascal language by Nicklaus Wirth is believed to be teaching students structural programming. Soon, due to the implementation in Pascal of progressive ideas of the time, it spread among programmers. [1]

When developing a programming language, both its description and the translator from it to machine code should appear to the light. After 70 years, Pascal's language developed and improved, including new possibilities. New compilers and development environments for Pascal have been created.

Compilers from this language were available on the most common types of computers around the world. The availability of special methods for creating compilers from Pascal simplified their development and promoted the wide dissemination of the language. Compilers could optimize the code, and this allowed creating effective programs. This was one of the reasons for using Pascal as a system programming language.

In the 1980s, computer science began to penetrate the masses, the theme "Informatics" appeared in schools. Since at this time Pascal was distributed and established itself as a teaching language, it was widely used in schools and universities. As a result, a huge number of textbooks were written in this language.

Pascal remained a simple language, N. Wirth introduced some restrictions. So, Pascal "teaches" to understand how data is stored in the computer's memory,

but when working with them has a number of limitations that are deprived of most "real" languages.

Until now, Pascal deservedly is considered one of the best programming languages for elementary programming. Its modern modifications, such as Object Pascal, are widely used in industrial programming. [2]

Structure of the program for Turbo Pascal

The Pascal program consists of a header, a description section and an operator section. The program header contains the name of the program, for example: Program PRIM;

Descriptions can include: a section of plug-in libraries (modules); the label description section; section of the description of constants; type description section; a section describing variables; a section describing the procedures and functions.

Module Description Section must be the first among the sections of descriptions. Module names are separated from each other by commas: uses CRT, Graph;

Any operator in the program can be marked with a label. As a label, arbitrary unsigned integers can be used, containing no more than four digits. The label is placed before the operator and separated from it by a colon. All labels used in the program must be listed in the label description section, for example: label 3, 471, 29, Quit;

The description of constants allows using names as synonyms of constants, they should be defined in the section describing constants: const K = 1024; MAX = 16,384;

In the variable declaration section, you must specify all the variables used in the program and define their type: var P, Q, R: Integer; A, B: Char; F1, F2: Boolean;

A section of statements is a compound statement that contains between the service words begin end a sequence of statements.

In addition to descriptions and Pascal statements, the program can contain comments that represent an arbitrary sequence of characters located between the opening comment bracket {and the closing comment bracket}.

Example 1

```
program Primer; {вычисление суммы двух чисел}
var
  x, y, s: integer;
begin
  WriteLn('Введите через пробел два числа ');
  ReadLn(x, y);
  s := x + y;
  WriteLn('Сумма чисел равна ', s);
end.
```

This program requests two numbers from the keyboard, finds their sum and displays the answer. Now let's make the program clean the screen first, perform its actions, and at the end of the work allow the user to see the result, waiting for him to press the key. [3]

Example 2

```
program Primer; {вычисление суммы двух чисел}
uses Crt; {подключение модуля, необходимого для процедур
          очистки экрана и задержки}
var
  x,y,s: integer;
begin
  ClrScr; {очистка экрана}
  WriteLn('Введите через пробел два числа ');
  ReadLn(x,y);
  s := x + y;
  WriteLn('Сумма чисел равна ',s);
  ReadKey; {ожидание нажатия клавиши}
end.
```

Syntax and semantics of Pascal

An **alphabet** is a collection of symbols acceptable in a language. Alphabet Turbo Pascal includes the following set of basic symbols:

- lowercase and uppercase Latin letters:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h I j k l m n o p q r s t u v w x y z

- space
- Underline: _
- Arabic numerals: 0 1 2 3 4 5 6 7 8 9
- signs of operations: + - * / = <> <=> = @
- Limiters: . , '() [] (...) {} (* *) ...;
- specifies: ^ # \$
- reserved words: [3]

| | | | |
|-------------|----------------|-----------|---------|
| ABSOLUTE | EXPORTS | LIBRARY | SET |
| ASSEMBLER | EXTERNAL | MOD | SHL |
| AND | FAR | NAME | SHR |
| ARRAY | FILE | NIL | STRING |
| ASM | FOR | NEAR | THEN |
| ASSEMBLER | FORWARD | NOT | TO |
| BEGIN | FUNCTION | OBJECT | TYPE |
| CASE | GOTO | OF | UNIT |
| CONST | IF | OR | UNTIL |
| CONSTRUCTOR | IMPLEMENTATION | PACKED | USES |
| DESTRUCTOR | IN | PRIVATE | VAR |
| DIV | INDEX | PROCEDURE | VIRTUAL |
| DO | INHERITED | PROGRAM | WHILE |
| DOWNT0 | INLINE | PUBLIC | WITH |
| ELSE | INTERFACE | RECORD | XOR |
| END | INTERRUPT | REPEAT | EXPORT |
| LABEL | RESIDENT | | |

Names (identifiers) are called language elements - constants, labels, types, variables, procedures, functions, modules, objects. An identifier in Turbo Pascal can include:

- Letters of the Latin alphabet,
- numbers
- an underscore.

To separate identifiers, numbers, reserved words from each other, we use delimiters such as:

- space and tabulation;
- line translation;
- a comment.

Numbers in the Pascal language are usually written in decimal notation. They can be whole and valid. The positive sign of a number can be omitted. Integers are written in the form without a decimal point: 217 -45 8954 +483

The actual numbers are written in the form with a decimal point: -8.6 4.0

It is also possible to write using the decimal order, which is represented by the letter E: 5E12 -1.72E9 73.1E-16)

Pascal allows the recording of integers and fragments of real numbers in the form with the order in hexadecimal notation: \$ 7F \$ 40 \$ ABC0

Strings in Pascal are a sequence of characters written between apostrophes. If you need to use the apostrophe as a meaningful symbol, you should write two apostrophes.

For example: ‘CTPOKA’ ‘STRING’ ‘ΠΡΟΓΡΑΜΜΑ’ [3]

References

- 1 - <http://pascalabc.net/o-yazike-paskal>
- 2 - <https://pas1.ru/pascalhistory>
- 3 - <http://bourabai.kz/alg/pascal/index.html>