

METHODS OF SOLVING LINEAR PROGRAMMING LANGUAGES ON THE COMPUTER. THEIR PYTHON AND PASCAL SOFTWARE

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Annotation: In this article presents steps, algorithms and block diagrams of solving linear programming languages on a computer, and the program was developed in Python and Pascal software.

Keywords: Linear programming language, algorithm, block diagram.

МЕТОДЫ РЕШЕНИЯ ЯЗЫКОВ ЛИНЕЙНОГО ПРОГРАММИРОВАНИЯ НА КОМПЬЮТЕРЕ. ИХ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ НА PYTHON И PASCAL

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Аннотация: В данной статье представлены этапы, алгоритмы и блок-схемы решения языков линейного программирования на компьютере, а программа разработана в программном обеспечении Python и Pascal.

Ключевые слова: язык линейного программирования, алгоритм, блок-схема.

**KOMPYUTERDA CHIZIQLI DASTURLASH TILLARINI YECHISH USULLARI.
ULARNING DASTURI PYTHON VA PASCAL DASTURLARIDA**

Soliyeva Gavharoy Yodgorjon qizi
*Namangan Davlat Universiteti Amaliy matematika va
raqamlı texnologiyalari kafedrası o'qituvchisi*

Annotatsiya: Bu maqolada chiziqli dasturlash tillarining kompyuterda yechish bosqichlari, algoritm va blok - sxemalari keltirilgan bo`lib, dasturni Python va Pascal dasturiy ta'minotida ishlab chiqildi.

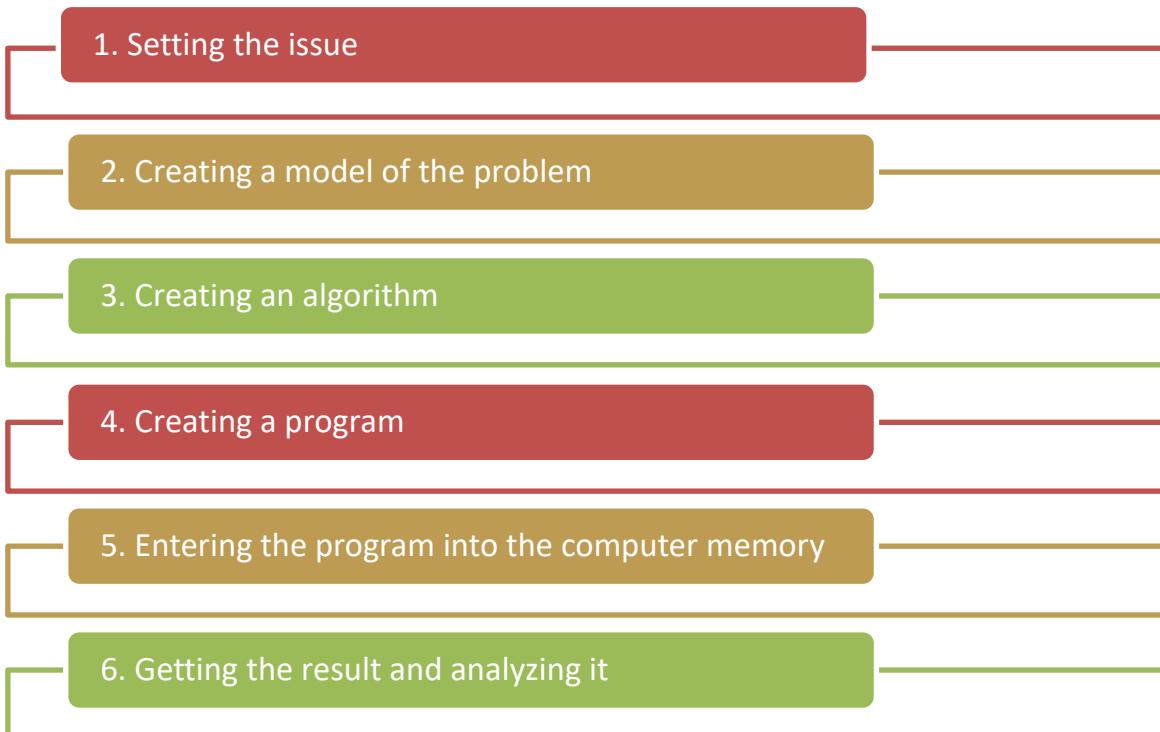
Kalit so`zlar: Chiziqli dasturlash tili, algoritm, blok-sxema.

METHODS OF SOLVING LINEAR PROGRAMMING LANGUAGES ON THE COMPUTER. THEIR PYTHON AND PASCAL SOFTWARE

Various programming languages are widely used in modern computers. These programs sometimes become the only factor in solving important issues in economy,

management, service, and especially in various fields of industry and production. This, in turn, requires efficient and rational use of computers for engineering and management employees.

Solving a problem on a computer is divided into several stages:



First of all, a mathematical model (model) is created that reflects the necessary aspects of the analyzed process or structure as fully as possible. The mathematical model is expressed in the form of a system of formulas and equations. In the next step, the optimal calculation algorithm for solving the created mathematical problem is created.

An algorithm is an ordered sequence of commands required to solve a problem, usually described using words or in the form of a block diagram.

Any algorithm is divided into three main types depending on the logical structure, that is, the order of execution: linear, branching and iterative. A linear algorithm is an algorithm in which all instructions are executed sequentially.

EXAMPLE: $u = (1 + z) * \frac{x + \frac{y}{z}}{a - \frac{1}{1 - x^2}} + \frac{\sin^2 x}{x^2 + y^2}$

1) Setting the issue:

$$x = 8 \quad y = 6 \quad z = 3 \quad a = 5 \quad U = ?$$

2) Creating a model of the problem:

We will enter the marking

$$G = x + \frac{y}{z}; \quad B = a - \frac{1}{1 - x^2}; \quad C = x * x + y * y;$$

$$U = (1 + z) * (G/B) + \text{math.sin}(x) * \text{math.sin}(x)/C$$

3) Creating an algorithm:

- Let it begin;
- x,y,z,a variables should be entered;
- Enter G, B, C markings;

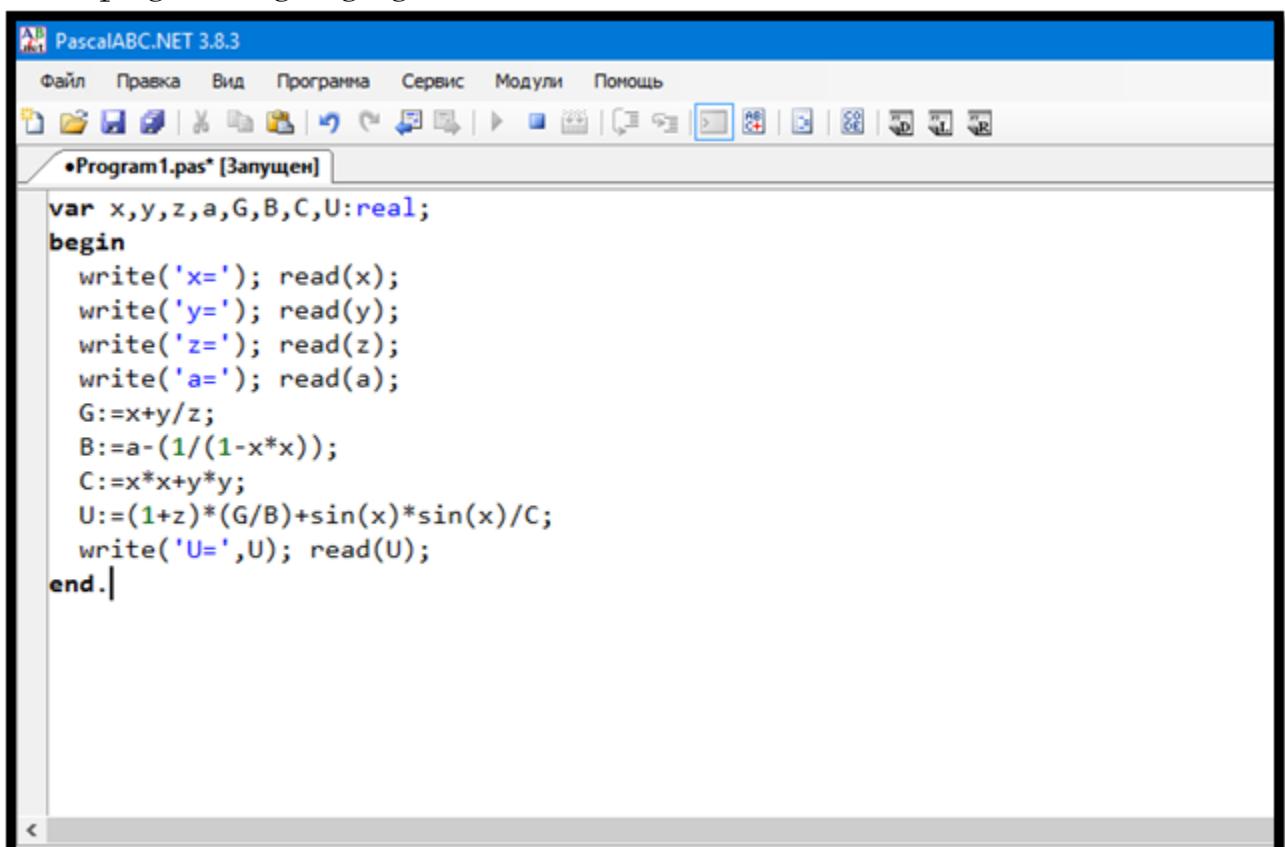
- Enter the value of that expression;
- Let it be printed;
- let it be completed.

4) Creating a program:

```
var x,y,z,a,G,B,C,U:real;
begin
  write('x=');           read(x);
  write('y=');           read(y);
  write('z=');           read(z);
  write('a=');           read(a);
  G:=x+y/z;
  B:=a-(1/(1-x*x));
  C:=x*x+y*y;
  U:=(1+z)*(G/B)+sin(x)*sin(x)/C;
  write('U=',U); read(U);
end.
```

5) Inserting the program into the computer memory:

Pascal programming language code:



The screenshot shows the PascalABC.NET 3.8.3 IDE interface. The title bar reads "PascalABC.NET 3.8.3". The menu bar includes "Файл" (File), "Правка" (Edit), "Вид" (View), "Программа" (Program), "Сервис" (Service), "Модули" (Modules), and "Помощь" (Help). Below the menu is a toolbar with various icons. The main window displays a code editor with the file "Program1.pas" open. The code is identical to the one provided in the text above, written in Pascal. The code editor has syntax highlighting where variables like x, y, z, a, G, B, C, U are in blue, and numbers and operators are in black. The cursor is at the end of the "end." keyword.

6) Obtaining and analyzing results: Program result:

Окно вывода

```
x=8
y=6
z=3
a=5
U=7.98447184170541
```

Code in Python programming language:

Spyder (Python 3.9)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\Soliyeva Gavharoy\untitled0.py

HIMOYA PDT -2.py HIMOYA PDT-1.py untitled0.py*

```
1  # -*- coding: utf-8 -*-
2  """
3  Created on Sun Feb  4 14:37:11 2024
4
5  @author: Soliyeva Gavharoy
6
7
8  x=float(input("x="))
9  y=float(input("y="))
10 z=float(input("z="))
11 a=float(input("a="))
12 import math
13 G=x+y/z
14 B=a-(1/(1-x*x))
15 C=x*x+y*y
16 U=(1+z)*(G/B)+math.sin(x)*math.sin(x)/C
17 print("U=",U)
18
```

Program result:

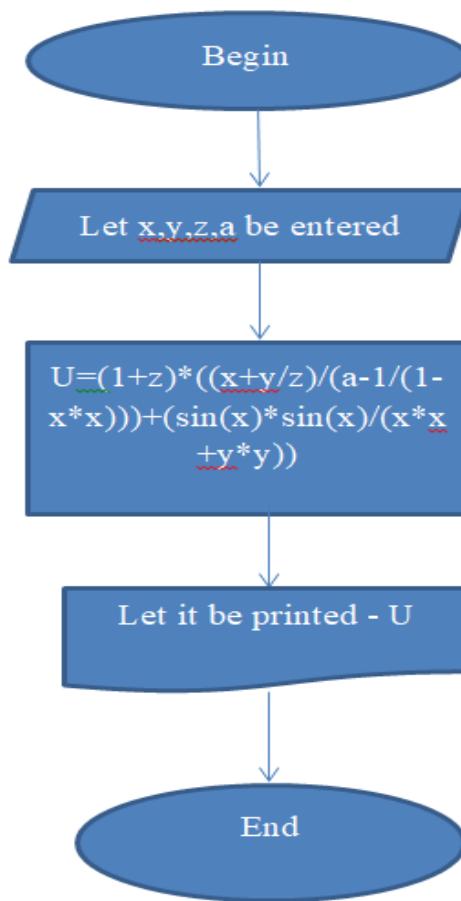
Console 1/A

```
IPython 7.31.1 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/Soliyeva Gavharoy/untitled0.py',
   wdir='C:/Users/Soliyeva Gavharoy')

x=8
y=6
z=3
a=5
U= 7.984471841705414
```

Representation of the algorithm through a block diagram:



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