МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ

«Санкт-Петербургский национальный исследовательский университет

информационных технологий, механики и оптики»

Факультет информационных технологий и программирования

Кафедра информационных систем

Методы оптимизации

Лабораторная работа № 3

Выполнили студенты группы М33051:

Ефимов Вячеслав Иосифович

Мелентьев Петр Алексеевич

САНКТ-ПЕТЕРБУРГ

2021

# LU-разложение

## Матрица A

Calendar

Description automatically generated

## Матрица L

Table

Description automatically generated

## Матрица U

Table

Description automatically generated

## Матрица L \* U

Table

Description automatically generated

# Нахождение обратной матрицы

## Матрица A

Table, calendar

Description automatically generated

## Матрица A-1

Text

Description automatically generated

## Матрица A \* A-1

Text

Description automatically generated

# Решение СЛАУ

## Матрица коэффициентов A

Calendar

Description automatically generated

## Вектор свободных членов b



## Вектор x



## Вектор A \* x



# Задание 3

Text, letter

Description automatically generated

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| k | Норма | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | 0 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | 0 | 1 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | 0 | 1 | 2 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | 0 | 1 | 2 | 3 | 4 |  |  |  |  |  |  |  |  |  |  |  |
| 5 | 0 | 1 | 2 | 3 | 4 | 5 |  |  |  |  |  |  |  |  |  |  |
| 6 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |  |  |  |  |  |  |  |  |  |
| 7 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |  |  |  |  |  |  |  |
| 8 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  |  |  |  |  |  |
| 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  |  |  |  |  |
| 10 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |  |  |  |  |
| 11 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |  |  |  |  |
| 12 | 0.02 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |  |  |  |
| 13 | 0.16 | 1.04 | 2.04 | 3.04 | 4.04 | 5.04 | 6.04 | 7.04 | 8.04 | 9.04 | 10.04 | 11.04 | 12.04 | 13.04 |  |  |
| 14 | 1.07 | 0.71 | 1.71 | 2.71 | 3.71 | 4.71 | 5.71 | 6.71 | 7.71 | 8.71 | 9.71 | 10.71 | 11.71 | 12.71 | 13.71 |  |
| 15 | 3.87 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

# Задание 4

Diagram

Description automatically generated with medium confidence

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| k | Норма | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | 0 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | 0 | 1 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | 0 | 1 | 2 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | 0 | 1 | 2 | 3 | 4 |  |  |  |  |  |  |  |  |  |  |  |
| 5 | 0 | 1 | 2 | 3 | 4 | 5 |  |  |  |  |  |  |  |  |  |  |
| 6 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |  |  |  |  |  |  |  |  |  |
| 7 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |  |  |  |  |  |  |  |
| 8 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  |  |  |  |  |  |
| 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  |  |  |  |  |
| 10 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |  |  |  |  |
| 11 | 0.03 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |  |  |  |  |
| 12 | 3.9 | 1 | 2 | 3 | 4.01 | 4.91 | 6.41 | 5.86 | 10.01 | 6.6 | 11.76 | 10.27 | 12.13 |  |  |  |
| 13 | 357.9 | 1 | 2 | 2.98 | 4.33 | 2.01 | 22.19 | -49 | 138.7 | -194 | 220.2 | -127 | 64.38 | 4.3 |  |  |
| 14 | 195.9 | 1 | 2 | 3 | 4.01 | 5.02 | 4.96 | 14.58 | -21.4 | 80.01 | -102 | 126.7 | -63.4 | 41.2 | 9.37 |  |
| 15 | 242.3 | 1 | 2 | 3 | 3.97 | 5.33 | 3.57 | 18.52 | -29 | 91.64 | -119 | 152.1 | -92.9 | 63.5 | -0.2 | 16.7 |