

Отчет к лабораторной работе №5

Void selection_sort() сортирует предложения по длине от точки до точки, ставя наименьшее предложение первым.

Void print_string() выводит предложения по одному.

Void mirror_string() отзеркаливает предложение посимвольно.

Void nine_txt() отзеркаливает с помощью функции mirror_string() предложение посимвольно, затем слова внутри предложения посимвольно, вписывая результат в файл NINE.TXT.

Int point_coordinate() записывает координаты всех точек, встретившихся в тексте.

Void result() находит расстояния между точками (длину предложения), через функции selection_sort() и print_string() выводит символы между точками в нужном порядке, вызывает nine_txt() для наибольшего предложения..

Int main() обрабатывает флаги, проверяет все возможные случаи, выдавая ошибку при вводе недопустимого аргумента. После флага -tofile может как идти, так и не идти имя файла. При отсутствии имени файла создается новый файл tofile.txt. Считывается текст с клавиатуры/файла, учитывая возможность переноса строки посередине текста, превращая его в пробел. Конец ввода с клавиатуры обозначается знаком «^». Вызывает функцию result() для выполнения задания.

Приложение 1. Код программы.

```
#include <cstring>
#include <fstream>
#include <iostream>

void selection_sort(int *arr, int size, int *points) {
    for (int i = 0; i < size - 1; i++) {
        int min_index = i;
        for (int j = i + 1; j < size; j++) {
            if (arr[j] < arr[min_index]) {
                min_index = j;
            }
        }
        if (min_index != i) {
            int t = arr[i];
            arr[i] = arr[min_index];
            arr[min_index] = t;

            t = points[i];
            points[i] = points[min_index];
            points[min_index] = t;
        }
    }
}

void print_string(const char *symbols, int point, std::ostream
&output_stream) {
    int l = point;
    while (l > 0 && symbols[l - 1] != '.') {
        l--;
    }
    while (symbols[l] == ' ' || symbols[l] == '\n') {
        l++;
    }
    for (int l2 = l; l2 < point + 1; l2++) {
        output_stream << symbols[l2];
    }
    output_stream << std::endl;
}

void mirror_string(char *s, int begin, int end) {
    int mid = begin + (end - begin) / 2;
    for (int i = 0; i < mid - begin; ++i) {
        int left = begin + i;
        int right = begin + (end - begin) - i - 1;
        char t = s[left];
        s[left] = s[right];
        s[right] = t;
    }
}

void nine_txt(char *symbols, int right_point) {
    int left = right_point;
    while (left > 0 && symbols[left - 1] != '.') {
        --left;
    }
    while (symbols[left] == ' ' || symbols[left] == '\n') {
        ++left;
    }
    mirror_string(symbols, left, right_point);
    int right = left + 1;
    while (right < right_point) {
        while (symbols[right] != ' ' && symbols[right] != '.') {
```

```

        ++right;
    }
    mirror_string(symbols, left, right);
    left = right;
    while (left < right_point && symbols[left] == ' ') {
        ++left;
    }
    right = left + 1;
}

std::ofstream ofs("NINE.txt");
print_string(symbols, right_point - 1, ofs);
}

int point_coordinate(const char *symbols, int *points) {
    int k = 0;
    for (int j = 0; j < std::strlen(symbols); j++) {
        if (symbols[j] == '.') {
            points[k] = j;
            k++;
        }
    }
    return k;
}

void result(char *symbols, std::ostream &output_stream) {
    int points[100];
    int count = point_coordinate(symbols, points);
    int len[100];
    for (int k = 0; k < count; k++) {
        int l = points[k];
        while (l > 0 && symbols[l - 1] != '.') {
            l--;
        }
        while (symbols[l] == ' ' || symbols[l] == '\n') {
            l++;
        }
        len[k] = points[k] - l + 1;
    }
    selection_sort(len, count, points);
    for (int k = 0; k < count; k++) {
        print_string(symbols, points[k], output_stream);
    }

    nine_txt(symbols, points[count - 1]);
}

int main(int argc, char **argv) {
    bool tofile = false;
    bool fromfile = false;
    char *tofilename = nullptr;
    char *fromfilename = nullptr;
    for (std::size_t i = 1; i < argc; ++i) {
        if (std::strcmp(argv[i], "--tofile") == 0) {
            tofile = true;
            if ((i + 1) < argc && (std::strcmp(argv[i + 1], "--fromfile")
!= 0)) {
                tofilename = argv[i + 1];
                ++i;
            }
        } else if (std::strcmp(argv[i], "--fromfile") == 0) {
            fromfile = true;
            fromfilename = argv[i + 1];
            ++i;
        }
    }
}

```

```

    } else {
        std::cerr << "Unexpected argument: " << argv[i] << "\n";
        return EXIT_FAILURE;
    }
}
char symbols[10000];
if (fromfile) {
    std::ifstream input_stream(fromfilename);
    if (!input_stream) {
        std::cerr << "Can't open file: " << fromfilename << std::endl;
        return EXIT_FAILURE;
    }
    input_stream.getline(symbols, 10000, EOF);
} else {
    std::cout << "Enter the text" << "\n" << "To mark the end of the
input, type '^' and press Enter" << "\n"
        << std::endl;
    std::cin.getline(symbols, 10000, '^');
}
for (int i = 0; symbols[i] != '\0'; ++i) {
    if (symbols[i] == '\n') {
        symbols[i] = ' ';
    }
}
if (tofile) {
    std::ofstream ofs;
    if (tofilename) {
        ofs.open(tofilename);
    } else {
        ofs.open("tofile.txt");
    }
    result(symbols, ofs);
    ofs.close();
} else {
    result(symbols, std::cout);
}

return EXIT_SUCCESS;
}

```

Приложение 2. Makefile

```

CC=g++
CFLAGS=-c -std=c++17

all: laba_3

laba_3: main.o
    $(CC) main.o -o laba_3

main.o: main.cpp
    $(CC) $(CFLAGS) main.cpp -o main.o

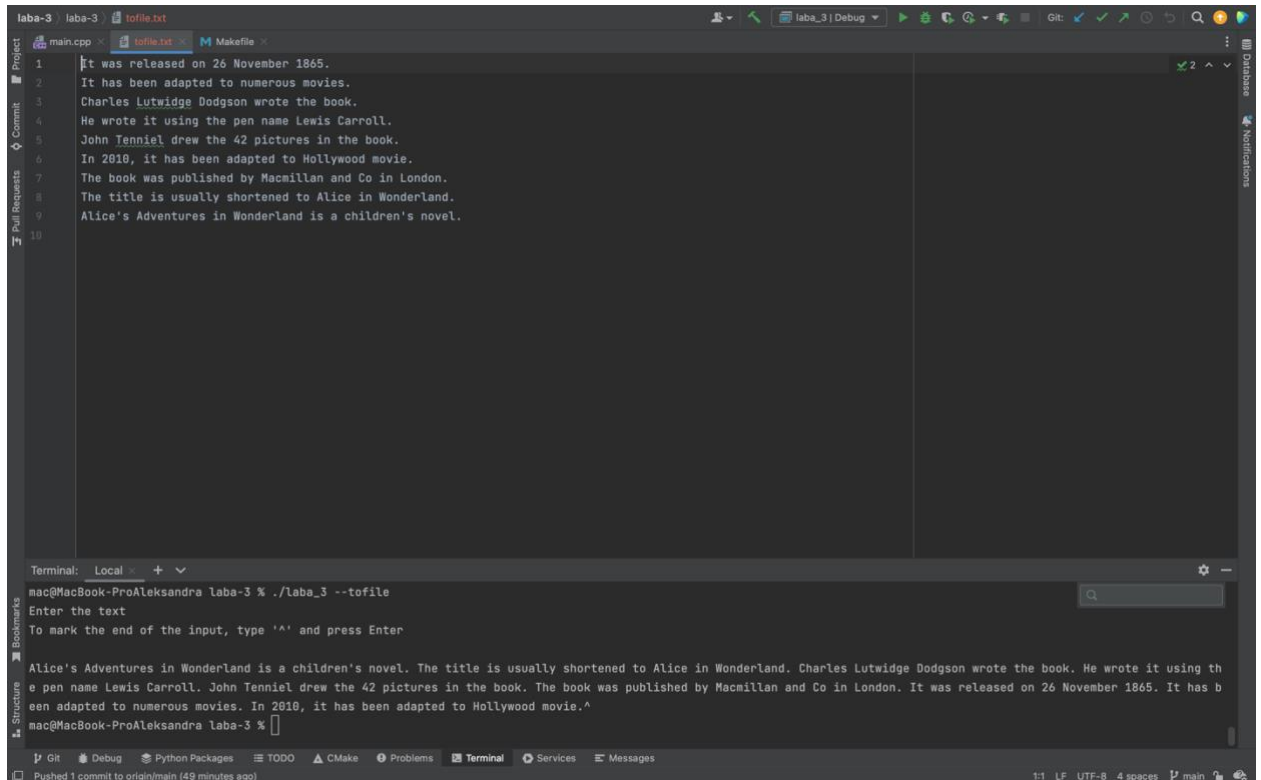
clean:
    rm -rf *.o laba_3

distclean:
    rm -rf laba_3 *.o *.txt

```

Приложение 3. Тесты

Ввод с клавиатуры, вывод в файл (без имени файла).

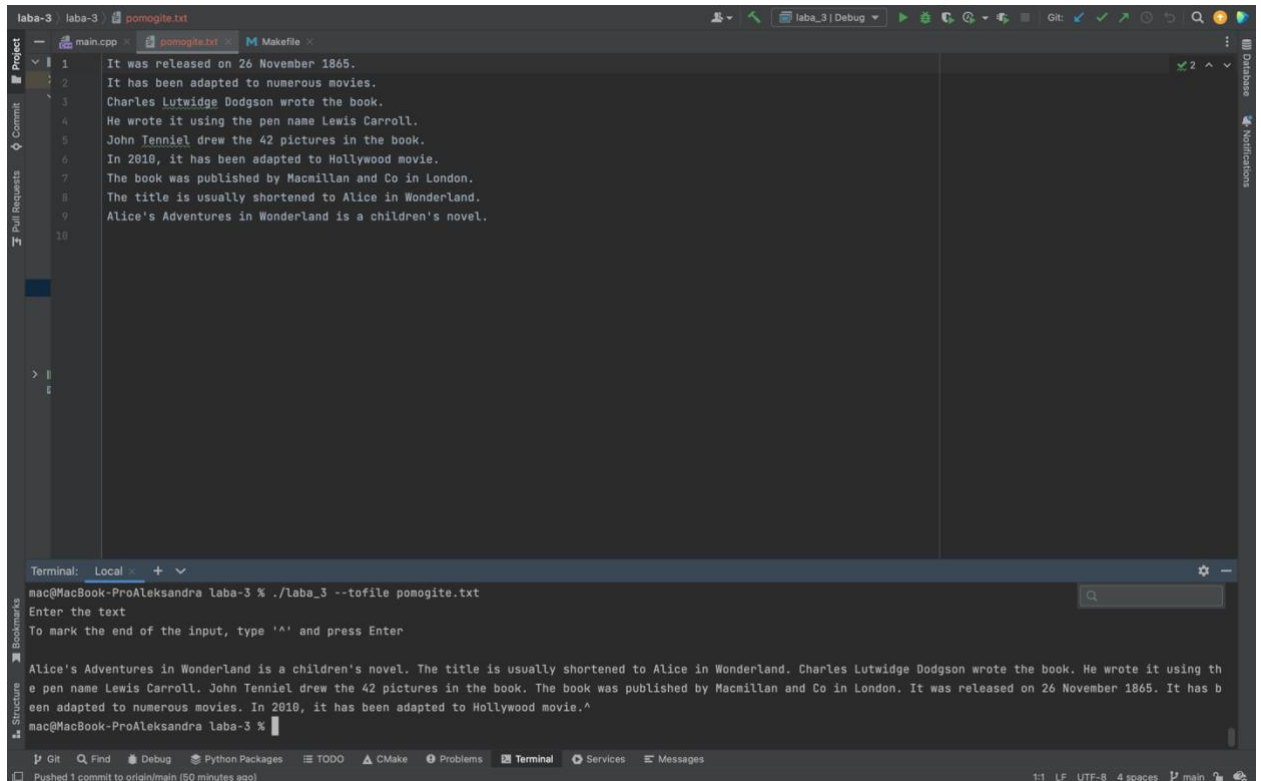


The screenshot shows the Visual Studio Code editor with a project named 'laba-3'. The file 'tofile.txt' is open, displaying the following text:

```
1 It was released on 26 November 1865.  
2 It has been adapted to numerous movies.  
3 Charles Lutwidge Dodgson wrote the book.  
4 He wrote it using the pen name Lewis Carroll.  
5 John Tenniel drew the 42 pictures in the book.  
6 In 2010, it has been adapted to Hollywood movie.  
7 The book was published by Macmillan and Co in London.  
8 The title is usually shortened to Alice in Wonderland.  
9 Alice's Adventures in Wonderland is a children's novel.  
10
```

The terminal at the bottom shows the command `mac@MacBook-ProAleksandra laba-3 % ./Laba_3 --tofile` and the output text, which matches the content of 'tofile.txt'. The status bar at the bottom indicates 'Pushed 1 commit to origin/main (49 minutes ago)'.

Ввод с клавиатуры, вывод в файл с именем несуществующего ранее файла.



The screenshot shows the Visual Studio Code editor with a project named 'laba-3'. The file 'pomogite.txt' is open, displaying the following text:

```
1 It was released on 26 November 1865.  
2 It has been adapted to numerous movies.  
3 Charles Lutwidge Dodgson wrote the book.  
4 He wrote it using the pen name Lewis Carroll.  
5 John Tenniel drew the 42 pictures in the book.  
6 In 2010, it has been adapted to Hollywood movie.  
7 The book was published by Macmillan and Co in London.  
8 The title is usually shortened to Alice in Wonderland.  
9 Alice's Adventures in Wonderland is a children's novel.  
10
```

The terminal at the bottom shows the command `mac@MacBook-ProAleksandra laba-3 % ./Laba_3 --tofile pomogite.txt` and the output text, which matches the content of 'pomogite.txt'. The status bar at the bottom indicates 'Pushed 1 commit to origin/main (50 minutes ago)'.

Ввод из файла с выводом на экран, проверены разрыв строки и излишние пробелы.

```
laba-3 | laba-3 | input.txt
P... CMakeLists.txt
Project: laba-3 - ~/CLionProjects/le...
  > cmake-build-debug 2
    laba-3
      a.out
      GRADES.md
      input.txt
      laba_3
      main.cpp
      main.o
      Makefile
      NINE.txt
      README.md
      Temp
      CMakeLists.txt
  > External Libraries
  > Scratches and Consoles

Alice's Adventures in Wonderland is a children's novel. The title is usually shortened to Alice in Wonderland. Charles Lutwidge Dodge wrote the book.
the 42 pictures in the book. The book was published by Macmillan and Co in London. It was released on 26 November 1865. It has been adapted to numerous movies.
Charles Lutwidge Dodgson wrote the book. In 2010, it has been adapted to Hollywood. He wrote it using the pen name Lewis Carroll. John Tenniel drew the 42 pictures in the book.
The book was published by Macmillan and Co in London. The title is usually shortened to Alice in Wonderland. Alice's Adventures in Wonderland is a children's novel.

Terminal: Local
mac@MacBook-ProAleksandra laba-3 % ./laba_3 --fromfile input.txt
It was released on 26 November 1865.
It has been adapted to numerous movies.
Charles Lutwidge Dodgson wrote the book.
In 2010, it has been adapted to Hollywood.
He wrote it using the pen name Lewis Carroll.
John Tenniel drew the 42 pictures in the book.
The book was published by Macmillan and Co in London.
The title is usually shortened to Alice in Wonderland.
Alice's Adventures in Wonderland is a children's novel.
mac@MacBook-ProAleksandra laba-3 %
```

Ввод из файла, вывод в еще не существующий файл. Так же проверка на разрывы и пробелы.

```
laba-3 | laba-3 | tofile.txt
P... CMakeLists.txt
Project: laba-3 - ~/CLionProjects/le...
  > cmake-build-debug 2
    laba-3
      a.out
      GRADES.md
      input.txt
      laba_3
      main.cpp
      main.o
      Makefile
      NINE.txt
      README.md
      Temp
      CMakeLists.txt
  > External Libraries
  > Scratches and Consoles

1 It was released on 26 November 1865.
2 It has been adapted to numerous movies.
3 Charles Lutwidge Dodgson wrote the book.
4 In 2010, it has been adapted to Hollywood.
5 He wrote it using the pen name Lewis Carroll.
6 John Tenniel drew the 42 pictures in the book.
7 The book was published by Macmillan and Co in London.
8 The title is usually shortened to Alice in Wonderland.
9 Alice's Adventures in Wonderland is a children's novel.
10

Terminal: Local
It was released on 26 November 1865.
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Charles Lutwidge Dodgson wrote the book.
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John Tenniel drew the 42 pictures in the book.
The book was published by Macmillan and Co in London.
The title is usually shortened to Alice in Wonderland.
Alice's Adventures in Wonderland is a children's novel.
mac@MacBook-ProAleksandra laba-3 % ./laba_3 --fromfile input.txt --tofile tofile.txt
mac@MacBook-ProAleksandra laba-3 %
```

Вывод

В ходе работы я узнала, что такое distclean, научилась работать с выводом в созданные во время выполнения программы файлы и многострочным вводом в терминал.