Міністерство освіти і науки України
Національний університет «Львівська політехніка»
Кафедра систем штучного інтелекту

Звіт

про виконання лабораторних та практичних робіт блоку № 5
На тему: «Файли. Бінарні Файли. Символи і Рядкові Змінні та Текстові Файли. Стандартна бібліотека та деталі/методи роботи з файлами. Створення й використання бібліотек.»
з дисципліни: «Основи програмування»
до:
ВНС Лабораторної Роботи № 6
ВНС Лабораторної Роботи № 8
ВНС Лабораторної Роботи № 9
Алготестер Лабораторної Роботи №4
Алготестер Лабораторної Роботи №6
Практичних Робіт до блоку №5

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Кривичко Назар

Тема роботи:

Файли. Бінарні Файли. Символи і Рядкові Змінні та Текстові Файли. Стандартна бібліотека та деталі/методи роботи з файлами. Створення й використання бібліотек

Мета роботи:

Навчитись працювати з файловою системою в C++ , рядками типу std::string та char* . Використання стандартної бібліотеки та створення власних бібліотек

Джерела:

книга - Stephen Prata - “ *C++ Primer Plus* ”
книга - *Aditya Y.Bhargava* - “ *Grokking algorithms* ”

Виконання роботи:

Завдання № 3

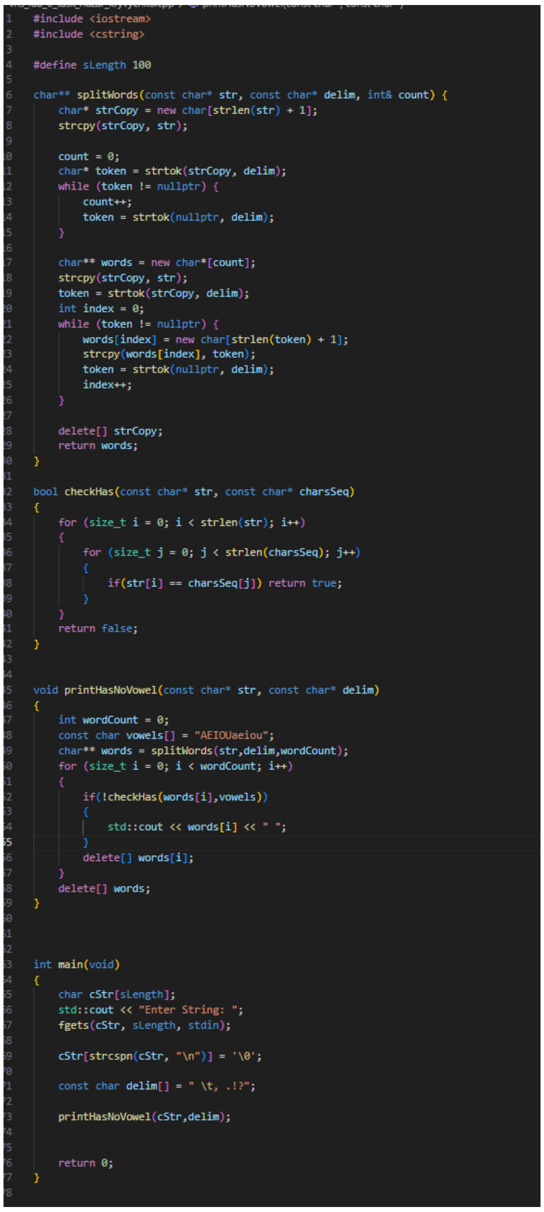
Requirements :

Vns Lab 6

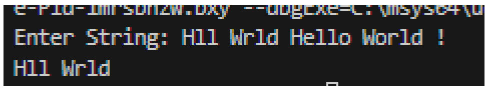
Time:

Expected: 1 hour

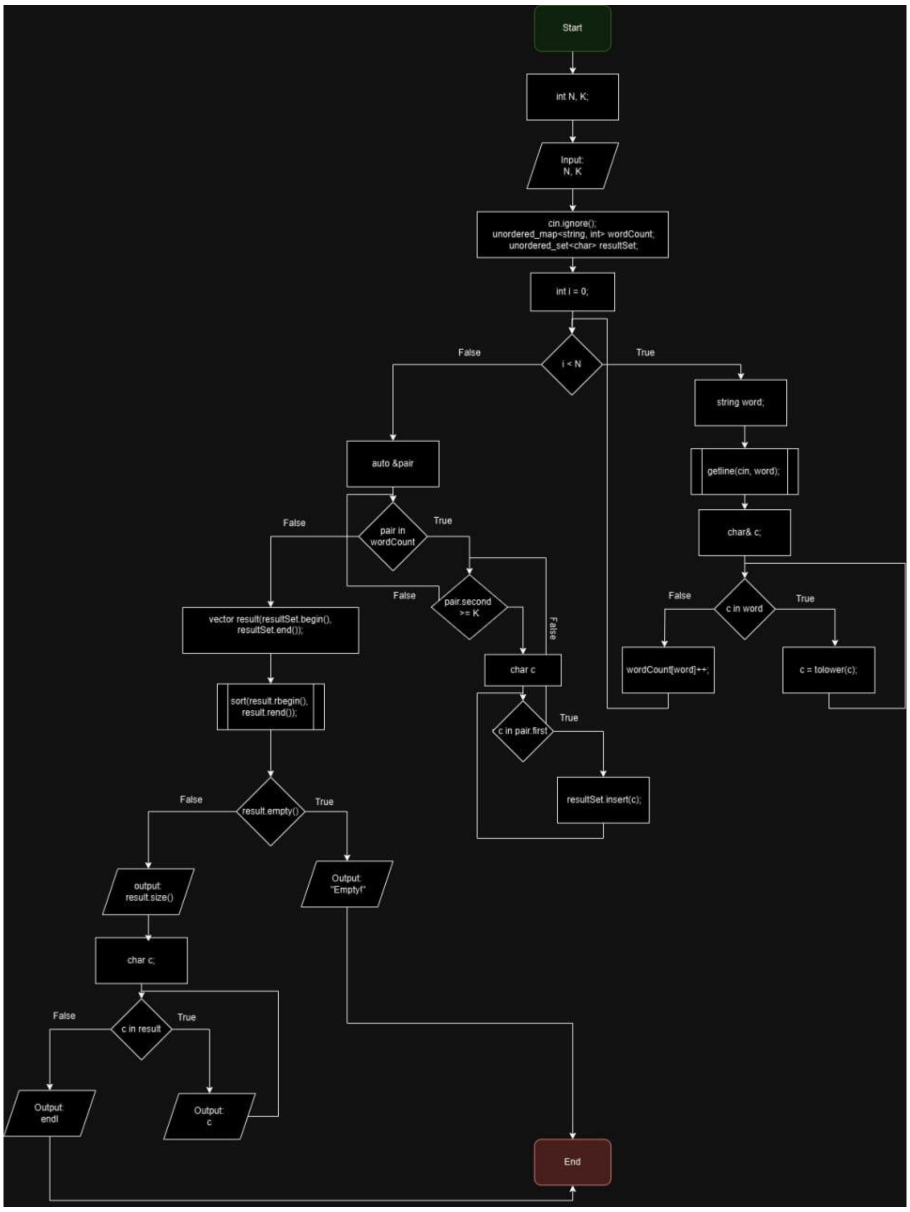
Spent: up to 1 hour



```cpp
#include <iostream>
#include <cstring>

#define sLength 100

char** splitWords(const char* str, const char* delim, int& count) {
    char* strCopy = new char[strlen(str) + 1];
    strcpy(strCopy, str);

    count = 0;
    char* token = strtok(strCopy, delim);
    while (token != nullptr) {
        count++;
        token = strtok(nullptr, delim);
    }

    char** words = new char*[count];
    strcpy(strCopy, str);
    token = strtok(strCopy, delim);
    int index = 0;
    while (token != nullptr) {
        words[index] = new char[strlen(token) + 1];
        strcpy(words[index], token);
        token = strtok(nullptr, delim);
        index++;
    }

    delete[] strCopy;
    return words;
}

bool checkHas(const char* str, const char* charsSeq)
{
    for (size_t i = 0; i < strlen(str); i++)
    {
        for (size_t j = 0; j < strlen(charsSeq); j++)
        {
            if(str[i] == charsSeq[j]) return true;
        }
    }
    return false;
}


void printHasNoVowel(const char* str, const char* delim)
{
    int wordCount = 0;
    const char vowels[] = "AEIOUaeiou";
    char** words = splitWords(str,delim,wordCount);
    for (size_t i = 0; i < wordCount; i++)
    {
        if(!checkHas(words[i],vowels))
        {
            std::cout << words[i] << " ";
        }
        delete[] words[i];
    }
    delete[] words;
}



int main(void)
{
    char cStr[sLength];
    std::cout << "Enter String: ";
    fgets(cStr, sLength, stdin);

    cStr[strcspn(cStr, "\n")] = '\0';

    const char delim[] = " \t, .!?";

    printHasNoVowel(cStr,delim);


    return 0;
}
```



```
Enter String: Hll Wrld Hello World !
Hll Wrld
```



Завдання № 4

Requirements :

Vns Lab 8

Time:

Expected: 1 hour

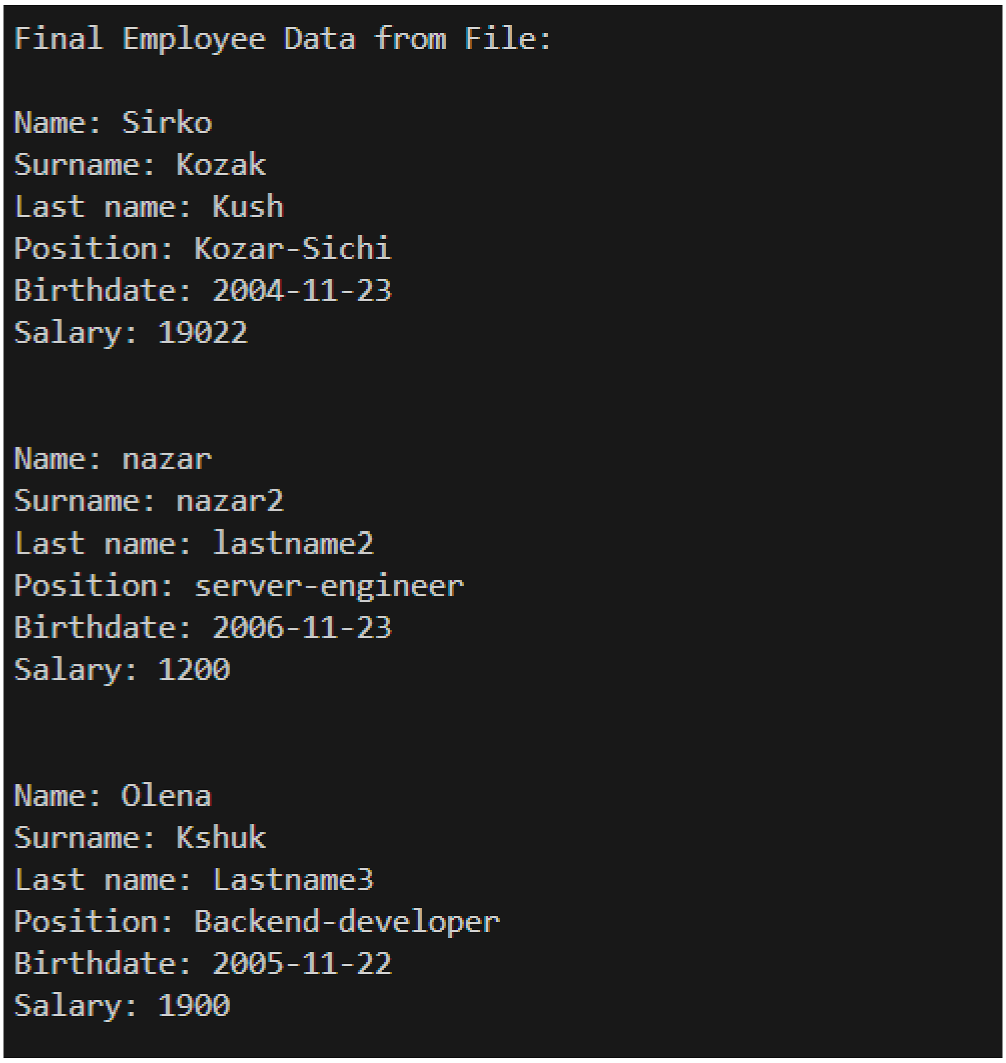
Spent: up to 1 hour

```
#include <iostream>
#include <cstdio>
#include <cstdlib>
```

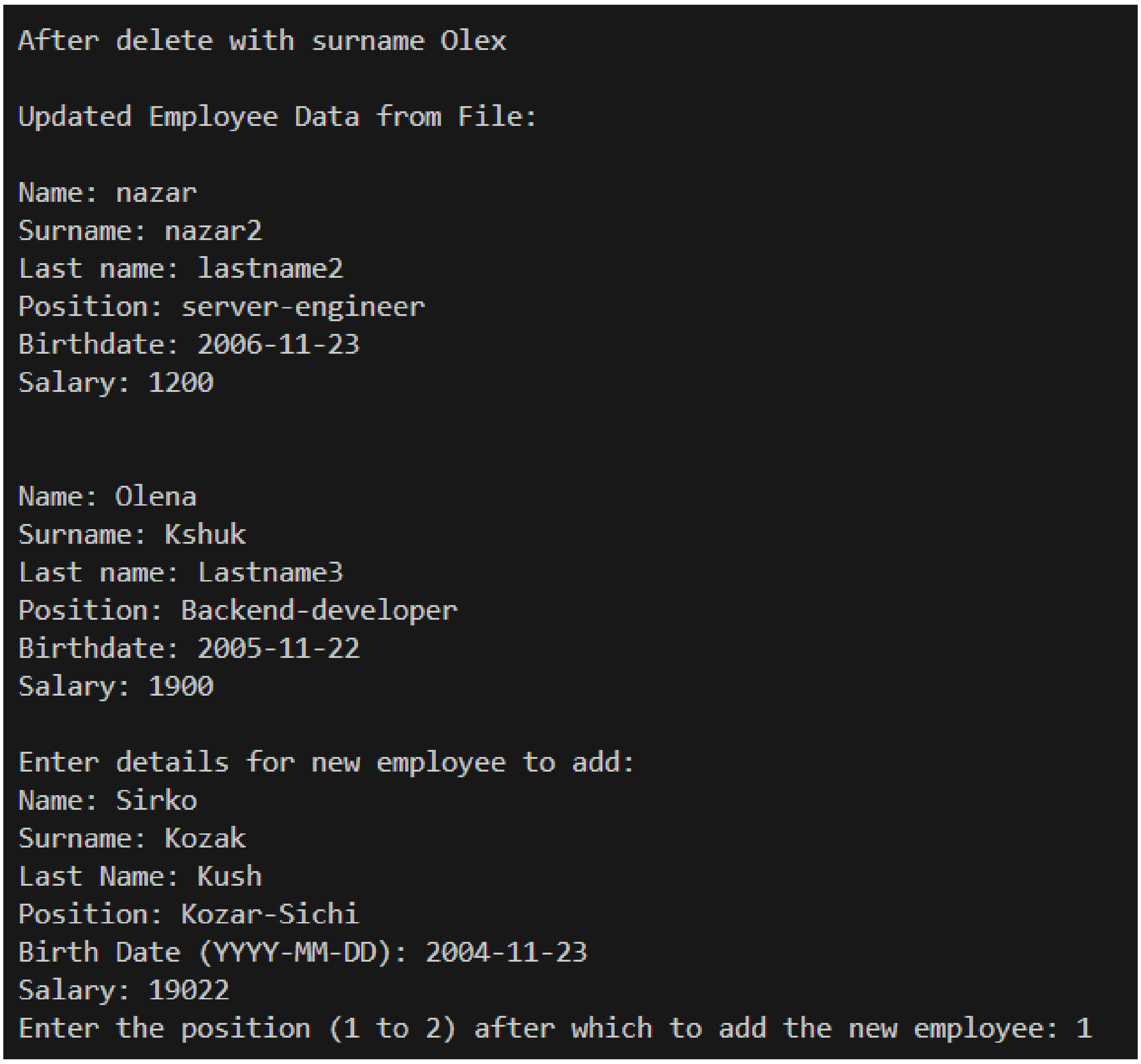
```cpp
#include <cstring>

static size_t aLength = 2;

typedef struct {
    char name[50];
    char surname[50];
    char last_name[50];
    char position[50];
    char birth_date[11];
    unsigned int salary;
} EMPLOYEE;

void print_emp(const EMPLOYEE& emp) {
    printf("Name: %s\nSurname: %s\nLast name: %s\nPosition: %s\nBirthdate: 
%s\nSalary: %u\n",
           emp.name, emp.surname, emp.last_name, emp.position, emp.birth_date, 
emp.salary);
}

void delete_with_surname(const char* surname) {
    EMPLOYEE* fEmps = new EMPLOYEE[aLength];
    FILE* fPtr = fopen("employees.bin", "rb");
    fread(fEmps, sizeof(EMPLOYEE), aLength, fPtr);
    fclose(fPtr);

    size_t cNewEms = aLength;
    for (size_t i = 0; i < aLength; i++) {
        if (strcmp(fEmps[i].surname, surname) == 0) {
            cNewEms--;
        }
    }

    EMPLOYEE* dEmps = new EMPLOYEE[cNewEms];
    size_t dEmpsI = 0;
    for (size_t i = 0; i < aLength; i++) {
        if (strcmp(fEmps[i].surname, surname) != 0) {
            dEmps[dEmpsI++] = fEmps[i];
        }
    }

    FILE* fnPtr = fopen("employees.bin", "wb");
    fwrite(dEmps, sizeof(EMPLOYEE), cNewEms, fnPtr);
    fclose(fnPtr);

    aLength = cNewEms;
    delete[] fEmps;
    delete[] dEmps;
}

void add_after(FILE* fptr, const unsigned int& number, const EMPLOYEE& newEmp)
{
    EMPLOYEE* emps = new EMPLOYEE[aLength];
    fread(emps, sizeof(EMPLOYEE), aLength, fptr);

    EMPLOYEE* newEmps = new EMPLOYEE[aLength + 1];
    size_t empsI = 0;

    for (size_t i = 0; i < number - 1; i++) {
        newEmps[empsI++] = emps[i];
    }

    newEmps[empsI++] = newEmp;

    for (size_t i = number - 1; i < aLength; i++) {
        newEmps[empsI++] = emps[i];
    }

    FILE* fCptr = fopen("employees.bin", "wb");
    fwrite(newEmps, sizeof(EMPLOYEE), aLength + 1, fCptr);
    fclose(fCptr);

    delete[] emps;
    delete[] newEmps;
}

void read_employee_data(EMPLOYEE* emps, int count) {
    for (int i = 0; i < count; i++) {
        printf("Enter details for employee %d:\n", i + 1);
        printf("Name: ");
        fgets(emps[i].name, sizeof(emps[i].name), stdin);
        emps[i].name[strcspn(emps[i].name, "\n")] = '\0';

        printf("Surname: ");
        fgets(emps[i].surname, sizeof(emps[i].surname), stdin);
        emps[i].surname[strcspn(emps[i].surname, "\n")] = '\0';

        printf("Last Name: ");
        fgets(emps[i].last_name, sizeof(emps[i].last_name), stdin);
        emps[i].last_name[strcspn(emps[i].last_name, "\n")] = '\0';
        printf("Position: ");
        fgets(emps[i].position, sizeof(emps[i].position), stdin);
        emps[i].position[strcspn(emps[i].position, "\n")] = '\0';

        printf("Birth Date (YYYY-MM-DD): ");
        fgets(emps[i].birth_date, sizeof(emps[i].birth_date), stdin);
        emps[i].birth_date[strcspn(emps[i].birth_date, "\n")] = '\0';

        printf("Salary: ");
        scanf("%u", &emps[i].salary);
        getchar();
    }
}

int main() {
    FILE* fPtr;

    fPtr = fopen("employees.bin", "wb");
    if (!fPtr) {
        perror("Error opening file for writing");
        return EXIT_FAILURE;
    }

    EMPLOYEE* emps = new EMPLOYEE[aLength];
    read_employee_data(emps, aLength);

    fwrite(emps, sizeof(EMPLOYEE), aLength, fPtr);
    fclose(fPtr);
    delete[] emps;

    fPtr = fopen("employees.bin", "rb");
    if (!fPtr) {
        perror("Error opening file for reading");
        return EXIT_FAILURE;
    }

    EMPLOYEE* rEmpArr = new EMPLOYEE[aLength];
    fread(rEmpArr, sizeof(EMPLOYEE), aLength, fPtr);
    fclose(fPtr);

    printf("\nEmployee Data from File:\n");
    for (int i = 0; i < aLength; i++) {
        printf("\n");
        print_emp(rEmpArr[i]);
        printf("\n");
    }
```

```
printf("\nAfter delete with surname Olex\n");
delete_with_surname("Olex");

fPtr = fopen("employees.bin", "rb");
if (!fPtr) {
    perror("Error opening file for reading");
    return EXIT_FAILURE;
}

EMPLOYEE* updatedEmps = new EMPLOYEE[aLength];
fread(updatedEmps, sizeof(EMPLOYEE), aLength, fPtr);
fclose(fPtr);

printf("\nUpdated Employee Data from File:\n");
for (size_t i = 0; i < aLength; i++) {
    printf("\n");
    print_emp(updatedEmps[i]);
    printf("\n");
}

EMPLOYEE newEmp;
printf("Enter details for new employee to add:\n");
printf("Name: ");
fgets(newEmp.name, sizeof(newEmp.name), stdin);
newEmp.name[strcspn(newEmp.name, "\n")] = '\0';

printf("Surname: ");
fgets(newEmp.surname, sizeof(newEmp.surname), stdin);
newEmp.surname[strcspn(newEmp.surname, "\n")] = '\0';

printf("Last Name: ");
fgets(newEmp.last_name, sizeof(newEmp.last_name), stdin);
newEmp.last_name[strcspn(newEmp.last_name, "\n")] = '\0';

printf("Position: ");
fgets(newEmp.position, sizeof(newEmp.position), stdin);
newEmp.position[strcspn(newEmp.position, "\n")] = '\0';

printf("Birth Date (YYYY-MM-DD): ");
fgets(newEmp.birth_date, sizeof(newEmp.birth_date), stdin);
newEmp.birth_date[strcspn(newEmp.birth_date, "\n")] = '\0';

printf("Salary: ");
scanf("%u", &newEmp.salary);
getchar();
```

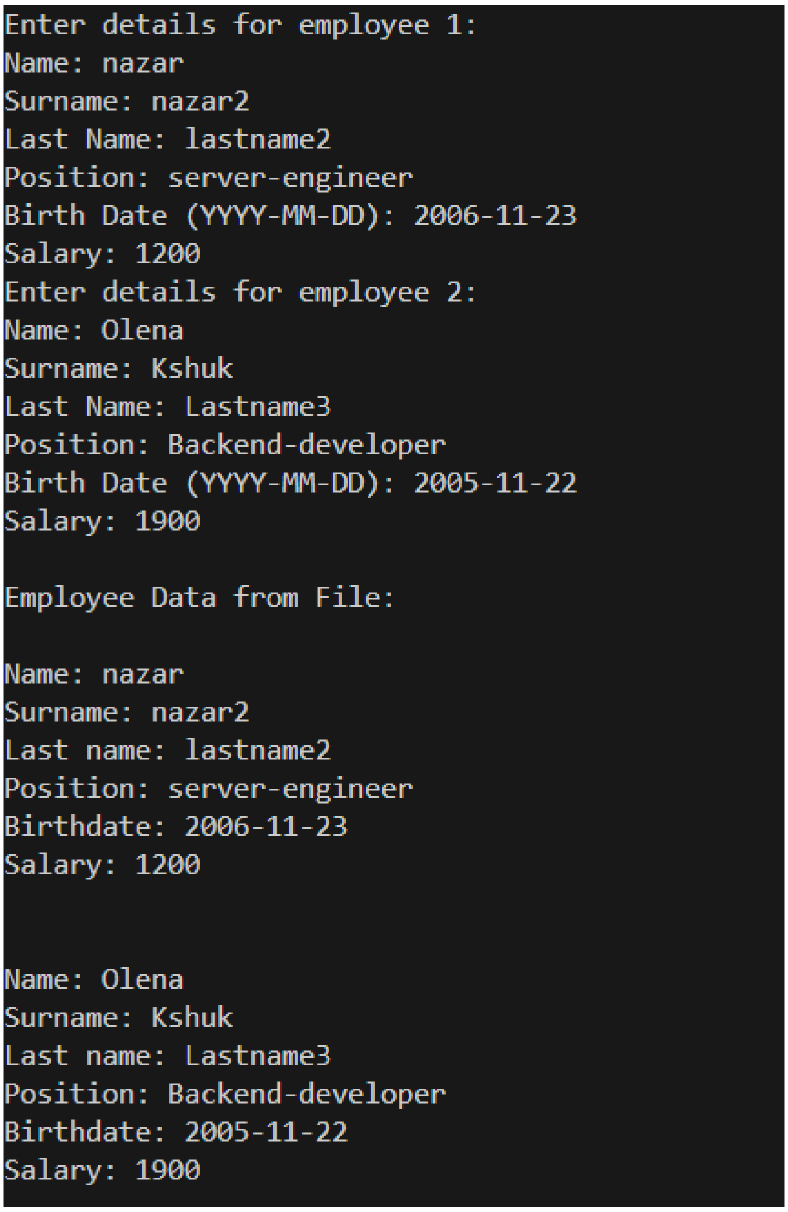
```
    unsigned int position;
    printf("Enter the position (1 to %zu) after which to add the new employee:
", aLength);
    scanf("%u", &position);
    getchar();

    if (position > 0 && position <= aLength) {
        fPtr = fopen("employees.bin", "rb+");
        add_after(fPtr, position, newEmp);
        fclose(fPtr);
    } else {
        printf("Invalid position!\n");
    }

    fPtr = fopen("employees.bin", "rb");
    if (!fPtr) {
        perror("Error opening file for reading");
        return EXIT_FAILURE;
    }

    EMPLOYEE* finalEmps = new EMPLOYEE[aLength + 1];
    fread(finalEmps, sizeof(EMPLOYEE), aLength + 1, fPtr);
    fclose(fPtr);

    printf("\nFinal Employee Data from File:\n");
    for (size_t i = 0; i < aLength + 1; i++) {
        printf("\n");
        print_emp(finalEmps[i]);
        printf("\n");
    }

    delete[] rEmpArr;
    delete[] updatedEmps;
    delete[] finalEmps;

    return 0;
}
```



```
Final Employee Data from File:

Name: Sirko
Surname: Kozak
Last name: Kush
Position: Kozar-Sichi
Birthdate: 2004-11-23
Salary: 19022


Name: nazar
Surname: nazar2
Last name: lastname2
Position: server-engineer
Birthdate: 2006-11-23
Salary: 1200


Name: Olena
Surname: Kshuk
Last name: Lastname3
Position: Backend-developer
Birthdate: 2005-11-22
Salary: 1900
```



```
After delete with surname Olex

Updated Employee Data from File:

Name: nazar
Surname: nazar2
Last name: lastname2
Position: server-engineer
Birthdate: 2006-11-23
Salary: 1200


Name: Olena
Surname: Kshuk
Last name: Lastname3
Position: Backend-developer
Birthdate: 2005-11-22
Salary: 1900

Enter details for new employee to add:
Name: Sirko
Surname: Kozak
Last Name: Kush
Position: Kozar-Sichi
Birth Date (YYYY-MM-DD): 2004-11-23
Salary: 19022
Enter the position (1 to 2) after which to add the new employee: 1
```



```
Enter details for employee 1:
Name: nazar
Surname: nazar2
Last Name: lastname2
Position: server-engineer
Birth Date (YYYY-MM-DD): 2006-11-23
Salary: 1200
Enter details for employee 2:
Name: Olena
Surname: Kshuk
Last Name: Lastname3
Position: Backend-developer
Birth Date (YYYY-MM-DD): 2005-11-22
Salary: 1900

Employee Data from File:

Name: nazar
Surname: nazar2
Last name: lastname2
Position: server-engineer
Birthdate: 2006-11-23
Salary: 1200


Name: Olena
Surname: Kshuk
Last name: Lastname3
Position: Backend-developer
Birthdate: 2005-11-22
Salary: 1900
```

Завдання № 5

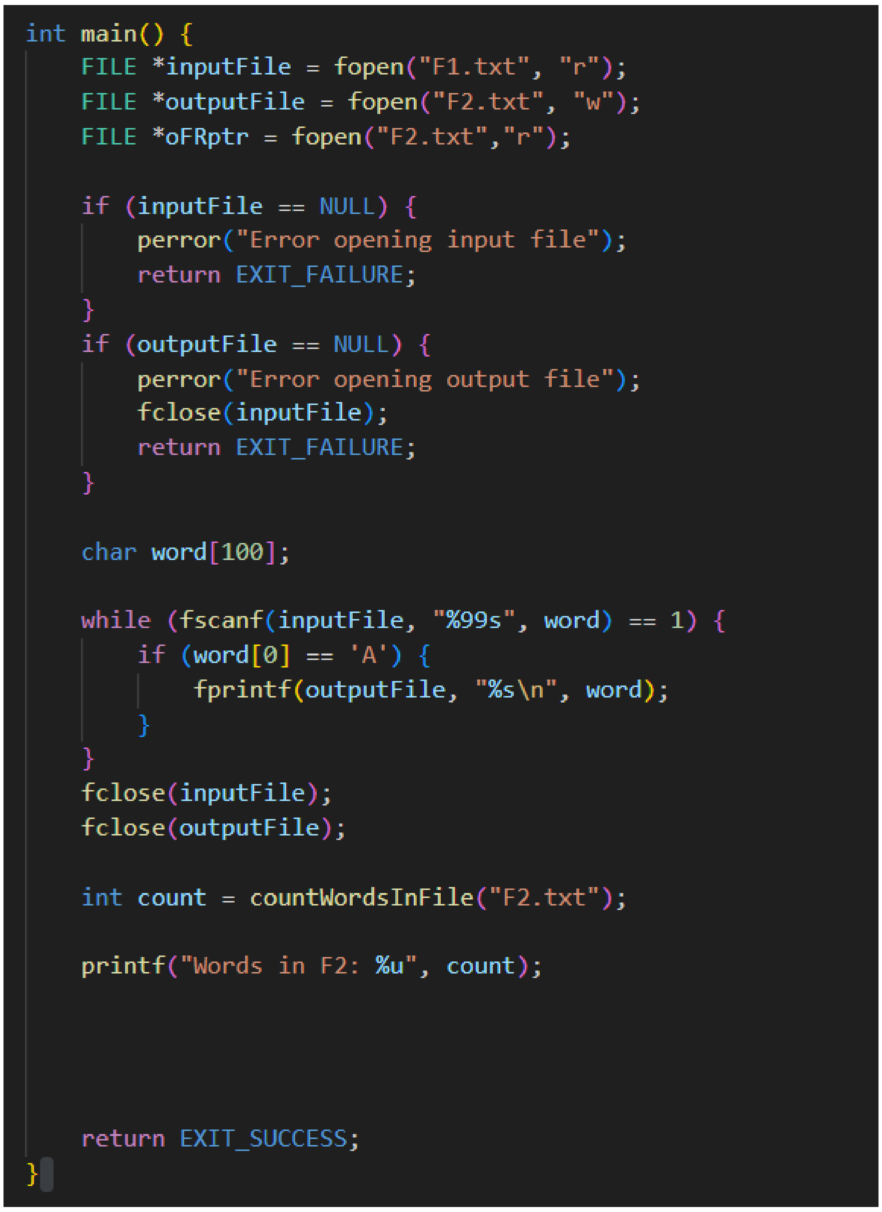
Requirements :

Vns Lab 9

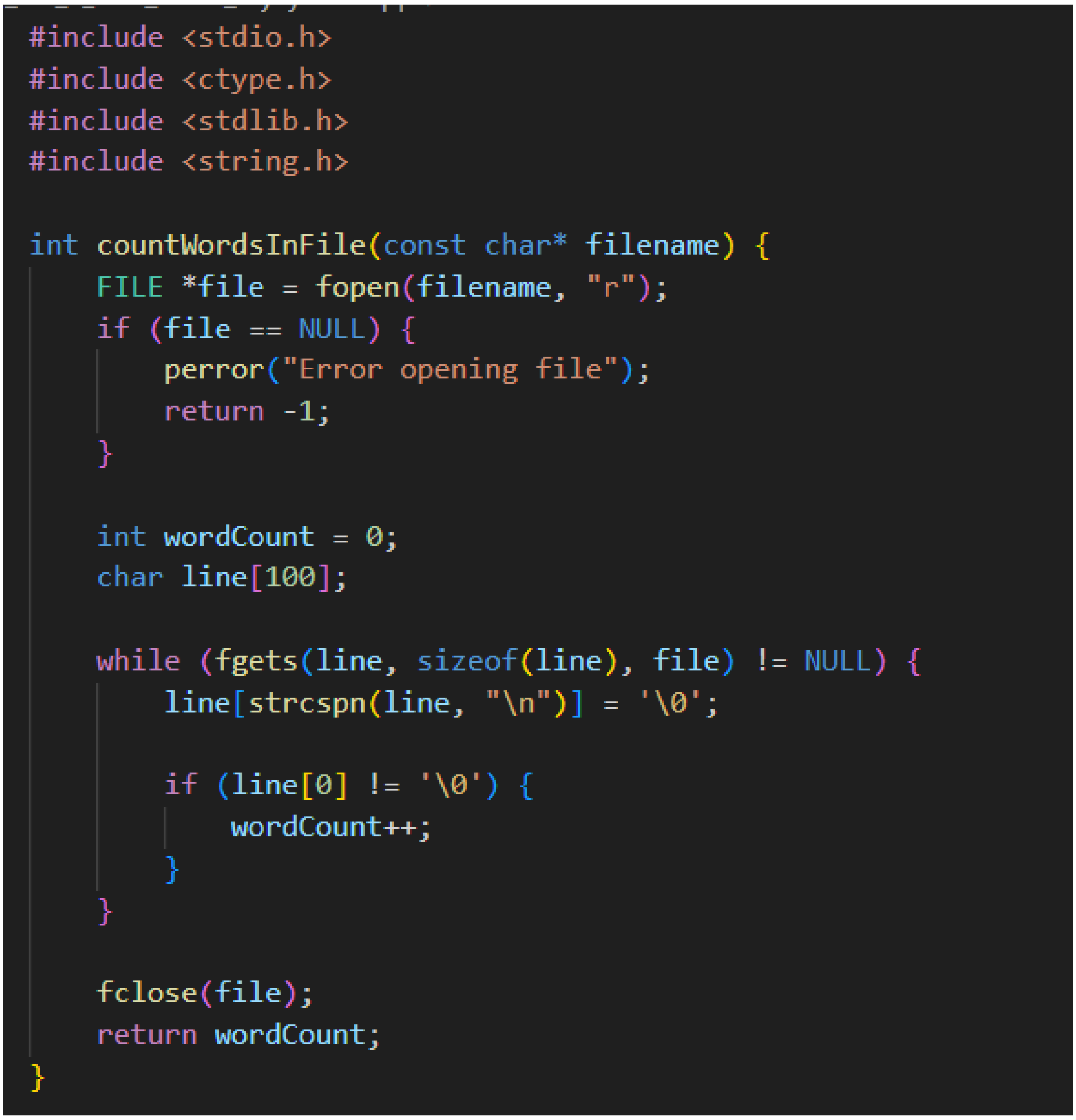
Time:

Expected: 1 hour

Spent: up to 1 hour

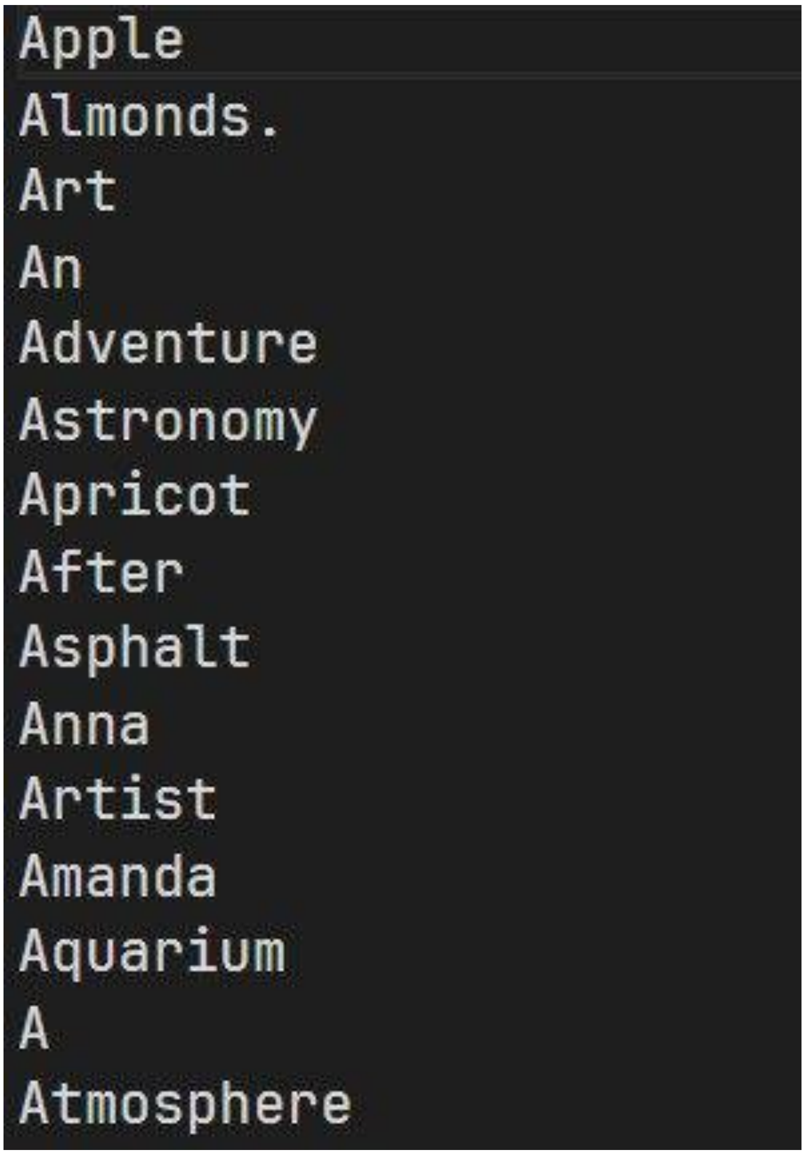


```c
int main() {
    FILE *inputFile = fopen("F1.txt", "r");
    FILE *outputFile = fopen("F2.txt", "w");
    FILE *oFRptr = fopen("F2.txt","r");

    if (inputFile == NULL) {
        perror("Error opening input file");
        return EXIT_FAILURE;
    }
    if (outputFile == NULL) {
        perror("Error opening output file");
        fclose(inputFile);
        return EXIT_FAILURE;
    }

    char word[100];

    while (fscanf(inputFile, "%99s", word) == 1) {
        if (word[0] == 'A') {
            fprintf(outputFile, "%s\n", word);
        }
    }
    fclose(inputFile);
    fclose(outputFile);

    int count = countWordsInFile("F2.txt");

    printf("Words in F2: %u", count);




    return EXIT_SUCCESS;
}
```



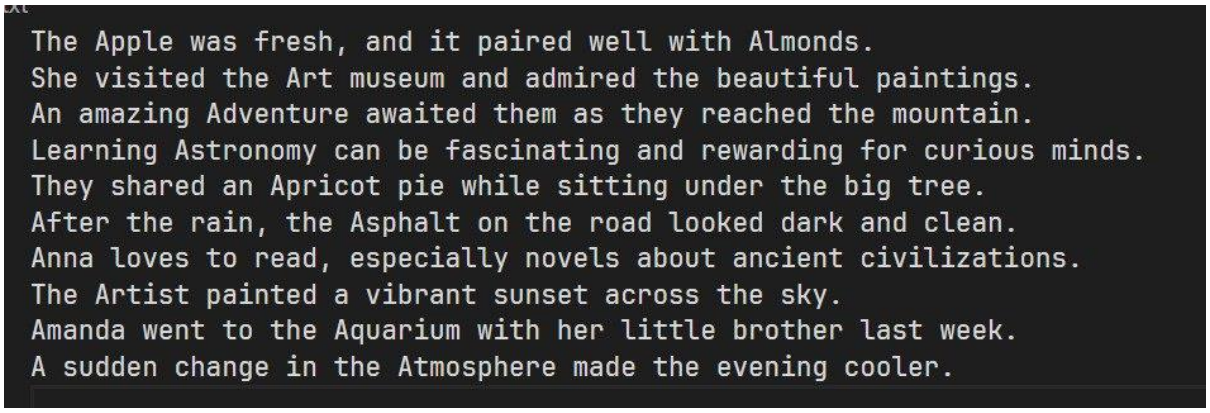
```c
#include <stdio.h>
#include <ctype.h>
#include <stdlib.h>
#include <string.h>

int countWordsInFile(const char* filename) {
    FILE *file = fopen(filename, "r");
    if (file == NULL) {
        perror("Error opening file");
        return -1;
    }

    int wordCount = 0;
    char line[100];

    while (fgets(line, sizeof(line), file) != NULL) {
        line[strcspn(line, "\n")] = '\0';

        if (line[0] != '\0') {
            wordCount++;
        }
    }

    fclose(file);
    return wordCount;
}
```

F2:



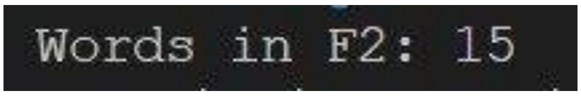
```
Apple
Almonds.
Art
An
Adventure
Astronomy
Apricot
After
Asphalt
Anna
Artist
Amanda
Aquarium
A
Atmosphere
```

F1:



```
The Apple was fresh, and it paired well with Almonds.
She visited the Art museum and admired the beautiful paintings.
An amazing Adventure awaited them as they reached the mountain.
Learning Astronomy can be fascinating and rewarding for curious minds.
They shared an Apricot pie while sitting under the big tree.
After the rain, the Asphalt on the road looked dark and clean.
Anna loves to read, especially novels about ancient civilizations.
The Artist painted a vibrant sunset across the sky.
Amanda went to the Aquarium with her little brother last week.
A sudden change in the Atmosphere made the evening cooler.
```

Result:



```
Words in F2: 15
```

Завдання № 6

Requirements :

Algotester Lab 4

Time:

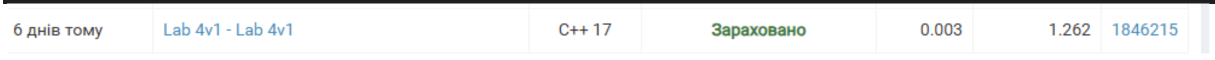
Expected: 1 hour

Spent: up to 1 hour

```
#include <iostream>
#include <vector>
#include <algorithm>
#include <unordered_map>

using namespace std;

// Function to print the size and sorted elements of a vector
void printSetResult(const vector<int>& result) {
    cout << result.size() << endl;
    for (int num : result) {
        cout << num << " ";
    }
    cout << endl;
}

// Function to perform the set operations
void manualSetOperations() {
    int N, M;

    // Input for the first array
    cin >> N;
    vector<int> array1(N);
    for (int i = 0; i < N; ++i) {
        cin >> array1[i];
    }

    // Input for the second array
    cin >> M;
    vector<int> array2(M);
    for (int i = 0; i < M; ++i) {
        cin >> array2[i];
    }

    // Use unordered_map to count occurrences of each element
    unordered_map<int, int> count1, count2;
    for (int num : array1) {
        count1[num]++;
    }
    for (int num : array2) {
        count2[num]++;
    }

    // Calculate difference N - M
    vector<int> difference_N_M;
    for (const auto& pair : count1) {
        int num = pair.first;
        int count = pair.second;
        if (count2.find(num) == count2.end()) {
            difference_N_M.insert(difference_N_M.end(), count, num);
        } else {
            // If it exists in both, add the difference in counts
            int diffCount = count - count2[num];
            if (diffCount > 0) {
                difference_N_M.insert(difference_N_M.end(), diffCount, num);
            }
        }
    }

    // Calculate difference M - N
    vector<int> difference_M_N;
    for (const auto& pair : count2) {
        int num = pair.first;
        int count = pair.second;
        if (count1.find(num) == count1.end()) {
            difference_M_N.insert(difference_M_N.end(), count, num);
        } else {
            // If it exists in both, add the difference in counts
            int diffCount = count - count1[num];
            if (diffCount > 0) {
                difference_M_N.insert(difference_M_N.end(), diffCount, num);
            }
        }
    }

    // Calculate intersection
    vector<int> intersection;
    for (const auto& pair : count1) {
```

```cpp
        int num = pair.first;
        if (count2.find(num) != count2.end()) {
            int minCount = min(pair.second, count2[num]);
            intersection.insert(intersection.end(), minCount, num);
        }
    }

    // Calculate union
    vector<int> unionSet;
    for (const auto& pair : count1) {
        int num = pair.first;
        int count = pair.second;
        unionSet.insert(unionSet.end(), count, num);
    }
    for (const auto& pair : count2) {
        int num = pair.first;
        int count = pair.second;
        if (count1.find(num) == count1.end()) {
            unionSet.insert(unionSet.end(), count, num);
        }
    }

    // Calculate symmetric difference
    vector<int> symmetric_difference;
    for (const auto& pair : count1) {
        int num = pair.first;
        if (count2.find(num) == count2.end()) {
            symmetric_difference.insert(symmetric_difference.end(),
pair.second, num);
        } else {
            int diffCount = pair.second - count2[num];
            if (diffCount > 0) {
                symmetric_difference.insert(symmetric_difference.end(),
diffCount, num);
            }
        }
    }
    for (const auto& pair : count2) {
        int num = pair.first;
        if (count1.find(num) == count1.end()) {
            symmetric_difference.insert(symmetric_difference.end(),
pair.second, num);
        } else {
            int diffCount = pair.second - count1[num];
            if (diffCount > 0) {
                symmetric_difference.insert(symmetric_difference.end(),
diffCount, num);
```

```
            }
        }
    }

    // Sort results for output
    sort(difference_N_M.begin(), difference_N_M.end());
    sort(difference_M_N.begin(), difference_M_N.end());
    sort(intersection.begin(), intersection.end());
    sort(unionSet.begin(), unionSet.end());
    sort(symmetric_difference.begin(), symmetric_difference.end());

    // Print results
    printSetResult(difference_N_M);
    printSetResult(difference_M_N);
    printSetResult(intersection);
    printSetResult(unionSet);
    printSetResult(symmetric_difference);
}

int main() {
    manualSetOperations();
    return 0;
}
```



6 днів тому	Lab 4v1 - Lab 4v1	C++ 17	Зараховано	0.003	1.262	1846215

[6.2]

```
#include <iostream>
#include <vector>
#include <algorithm>
#include <unordered_set>



void printsc(const std::vector<int>& v) {
    std::cout << v.size() << std::endl;
    for (const auto& el : v) {
        std::cout << el << ' ';
    }
    std::cout << std::endl;
}

int main() {
    size_t N, M;
    std::cin >> N;
    std::vector<int> v1(N);
    for (size_t i = 0; i < N; i++) {
        std::cin >> v1[i];
```

```cpp
    }

    std::cin >> M;
    std::vector<int> v2(M);
    for (size_t i = 0; i < M; i++) {
        std::cin >> v2[i];
    }

    std::sort(v1.begin(), v1.end());
    std::sort(v2.begin(), v2.end());

    // N - M
    std::vector<int> NdM;
    std::set_difference(v1.begin(), v1.end(), v2.begin(), v2.end(),
std::back_inserter(NdM));
    printsc(NdM);
    std::cout << std::endl;

    // M - N
    std::vector<int> MnD;
    std::set_difference(v2.begin(), v2.end(), v1.begin(), v1.end(),
std::back_inserter(MnD));
    printsc(MnD);
    std::cout << std::endl;

    // M with N
    std::vector<int> MwithN;
    std::set_intersection(v1.begin(), v1.end(), v2.begin(), v2.end(),
std::back_inserter(MwithN));
    printsc(MwithN);
    std::cout << std::endl;
    // M and N
    std::vector<int> MandN;
    std::set_union(v1.begin(), v1.end(), v2.begin(), v2.end(),
std::back_inserter(MandN));
    printsc(MandN);
    std::cout << std::endl;

    // M <-> N
    std::vector<int> MsN;
    std::set_symmetric_difference(v1.begin(), v1.end(), v2.begin(), v2.end(),
std::back_inserter(MsN));
    printsc(MsN);



    return 0;
```

```
}
```

Завдання № 7

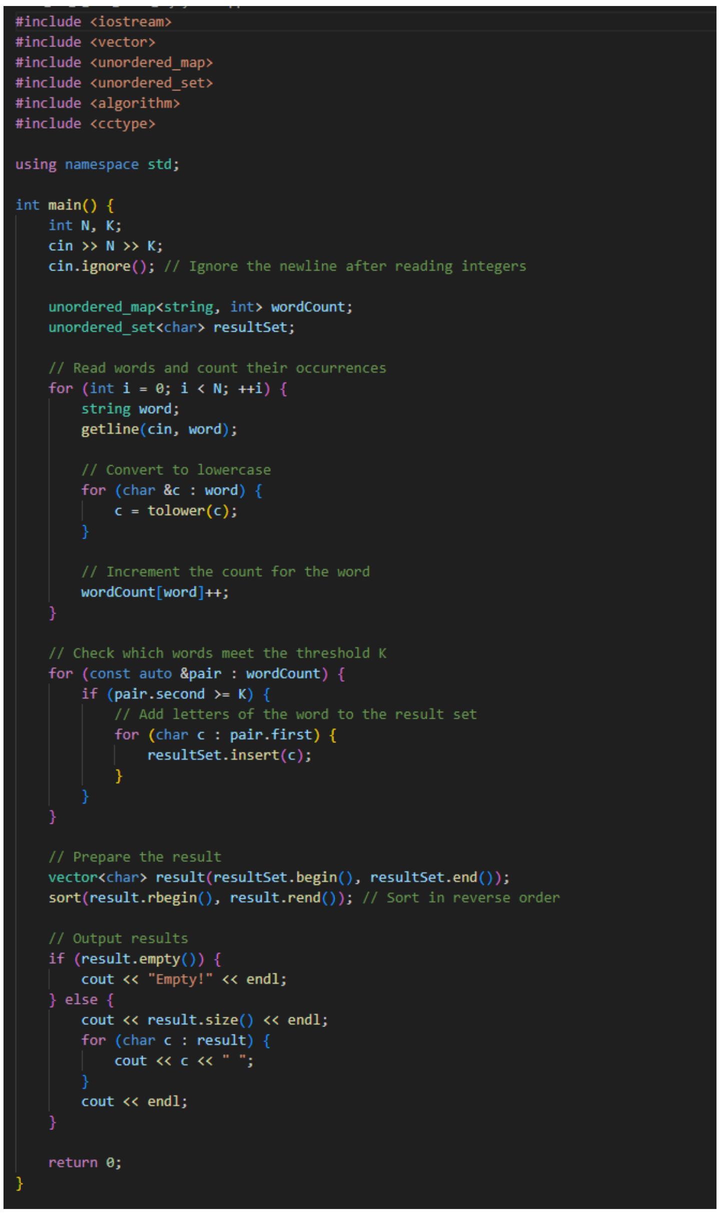
Requirements :

Algotester Lab 6

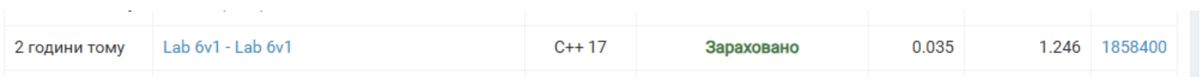
Time:

Expected: 1 hour

Spent: up to 1 hour



```cpp
#include <iostream>
#include <vector>
#include <unordered_map>
#include <unordered_set>
#include <algorithm>
#include <cctype>

using namespace std;

int main() {
    int N, K;
    cin >> N >> K;
    cin.ignore(); // Ignore the newline after reading integers

    unordered_map<string, int> wordCount;
    unordered_set<char> resultSet;

    // Read words and count their occurrences
    for (int i = 0; i < N; ++i) {
        string word;
        getline(cin, word);

        // Convert to lowercase
        for (char &c : word) {
            c = tolower(c);
        }

        // Increment the count for the word
        wordCount[word]++;
    }

    // Check which words meet the threshold K
    for (const auto &pair : wordCount) {
        if (pair.second >= K) {
            // Add letters of the word to the result set
            for (char c : pair.first) {
                resultSet.insert(c);
            }
        }
    }

    // Prepare the result
    vector<char> result(resultSet.begin(), resultSet.end());
    sort(result.rbegin(), result.rend()); // Sort in reverse order

    // Output results
    if (result.empty()) {
        cout << "Empty!" << endl;
    } else {
        cout << result.size() << endl;
        for (char c : result) {
            cout << c << " ";
        }
        cout << endl;
    }

    return 0;
}
```



2 години тому	Lab 6v1 - Lab 6v1	C++ 17	Зараховано	0.035	1.246	1858400

Завдання № 8

Requirements :

Class Practice Task

Time:

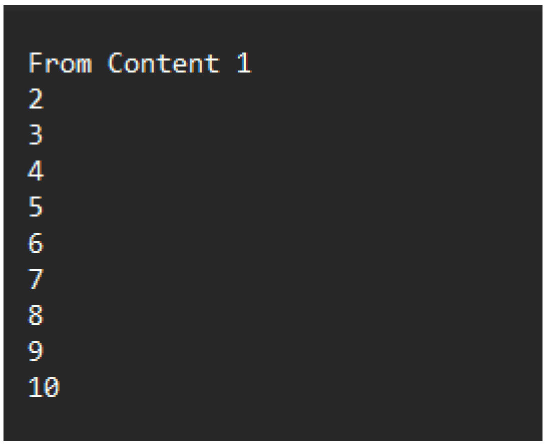
Expected: 1 hour

Spent: up to 1 hour

```cpp
#include <iostream>
#include <fstream>
#include <cstring>
#include <map>
#include <vector>
#include <string>

enum FileOpResult { Success = 0, Failure = 1 };

static std::map<FileOpResult, std::string> OperationStr = {
    { Success, "Success" },
    { Failure, "Failure" }
};

bool hasEnding(const std::string& fullString, const std::string& ending) {
    if (fullString.length() >= ending.length()) {
        return (0 == fullString.compare(fullString.length() - ending.length(),
ending.length(), ending));
    } else {
        return false;
    }
}

FileOpResult write_to_file(const char* name, const char* content) {
    if (name == nullptr || strcmp(name, "") == 0 || !hasEnding(name, ".txt"))
{
        name = "default.txt";
    }

    std::ofstream fileOut(name, std::ios::out | std::ios::trunc);
    if (!fileOut.is_open()) {
        return FileOpResult::Failure;
    }
    fileOut << content;
    if (!fileOut.good()) { // Check if writing to file was successful
        return FileOpResult::Failure;
    }

    fileOut.close();
    return fileOut.fail() ? FileOpResult::Failure : FileOpResult::Success;
}

unsigned int FileRead(std::istream& is, std::vector<char>& buff) {
    is.read(&buff[0], buff.size());
    return is.gcount();
}

void FileRead(std::ifstream& ifs, std::string& s) {
    const unsigned int BUFSIZE = 64 * 1024;
    std::vector<char> buffer(BUFSIZE);

    while (unsigned int n = FileRead(ifs, buffer)) {
        s.append(&buffer[0], n);
    }
}

FileOpResult copy_file(const char* file_from, const char* file_to) {
    if (file_from == nullptr || strcmp(file_from, "") == 0 ||
        file_to == nullptr || strcmp(file_to, "") == 0 ||
        !hasEnding(file_from, ".txt") || !hasEnding(file_to, ".txt")) {
        return FileOpResult::Failure;
    }

    std::ifstream fileIn(file_from, std::ios::in);
    if (!fileIn.is_open()) {
        return FileOpResult::Failure;
    }

    std::ofstream fileOut(file_to, std::ios::out | std::ios::trunc);
    if (!fileOut.is_open()) {
        fileIn.close();
        return FileOpResult::Failure;
    }

    std::string fileContent;
    FileRead(fileIn, fileContent);
    fileOut << fileContent;
```

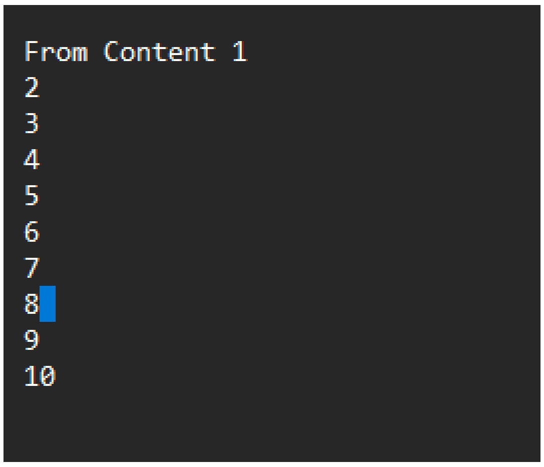
```cpp
    bool failure = fileIn.bad() || fileOut.bad();
    fileIn.close();
    fileOut.close();

    return failure ? FileOpResult::Failure : FileOpResult::Success;
}

int main() {
    // Task [1]
    std::string contentLine, fileName;
    std::cout << "Enter content: ";
    std::getline(std::cin, contentLine);
    std::cout << "Enter file name: (*.txt) (DEFAULT NAME = \"default.txt\"):
";
    std::getline(std::cin, fileName);
    FileOpResult writeResult = write_to_file(fileName.c_str(),
contentLine.c_str());
    std::cout << "Operation Result: " << OperationStr[writeResult] <<
std::endl;

    // Task [2]
    std::string fromFile, toFile;
    std::cout << "Enter file name {from}: ";
    std::getline(std::cin, fromFile);
    std::cout << "Enter file name {to}: ";
    std::getline(std::cin, toFile);
    FileOpResult copyResult = copy_file(fromFile.c_str(), toFile.c_str());
    std::cout << "Copy Operation Result: " << OperationStr[copyResult] <<
std::endl;

    return 0;
}
```

From.txt:



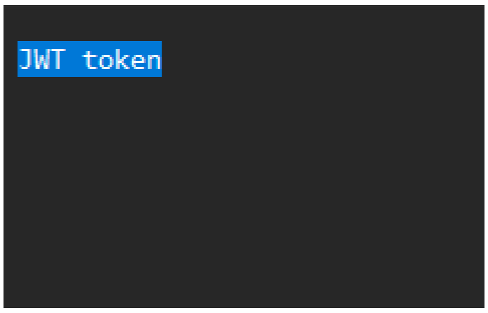
```
From Content 1
2
3
4
5
6
7
8
9
10
```

To.txt:

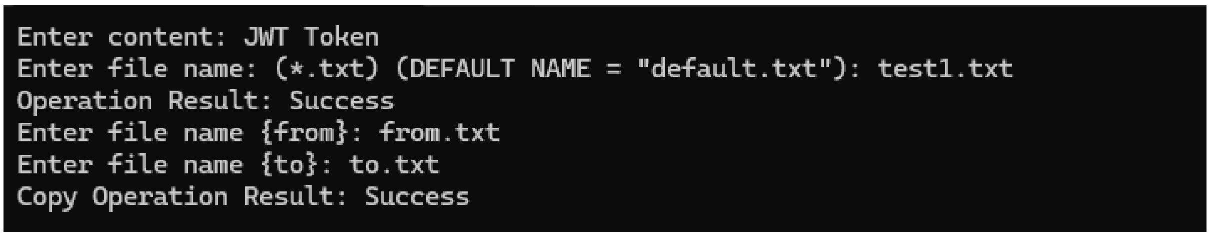


```
From Content 1
2
3
4
5
6
7
8
9
10
```

Test1.txt:



```
JWT token
```



```
Enter content: JWT Token
Enter file name: (*.txt) (DEFAULT NAME = "default.txt"): test1.txt
Operation Result: Success
Enter file name {from}: from.txt
Enter file name {to}: to.txt
Copy Operation Result: Success
```

Завдання № 9

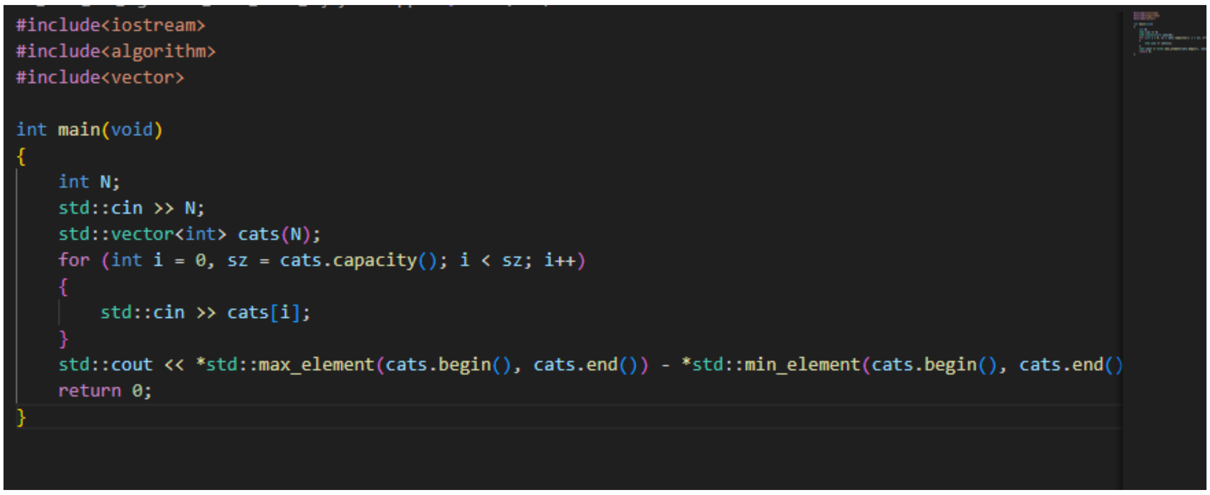
Requirements :

Class Practice Task

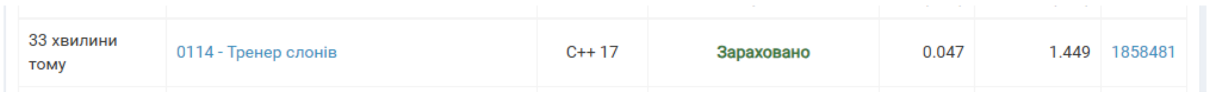
Time:

Expected: 1 hour

Spent: up to 1 hour



```cpp
#include<iostream>
#include<algorithm>
#include<vector>

int main(void)
{
    int N;
    std::cin >> N;
    std::vector<int> cats(N);
    for (int i = 0, sz = cats.capacity(); i < sz; i++)
    {
        std::cin >> cats[i];
    }
    std::cout << *std::max_element(cats.begin(), cats.end()) - *std::min_element(cats.begin(), cats.end()
    return 0;
}
```



33 хвилини тому	0114 - Тренер слонів	C++ 17	Зараховано	0.047	1.449	1858481

Pull Request: Link

Висновок :
Я навчився працювати з рядками типу char* та std::string , закріпив свої знання роботи з файлами на C та C++.