TRƯỜNG ĐẠI HỌC VINH
VIỆN KỸ THUẬT VÀ CÔNG NGHỆ

NGUYỄN ĐÌNH MẠNH – VÕ TẠ ĐỨC – VŨ HOÀNG HẢI

ĐỒ ÁN KẾT THÚC HỌC PHẦN
LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

ĐỀ TÀI SỐ 2

Nghệ An, tháng 6/2023

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ĐỀ TÀI SỐ 2

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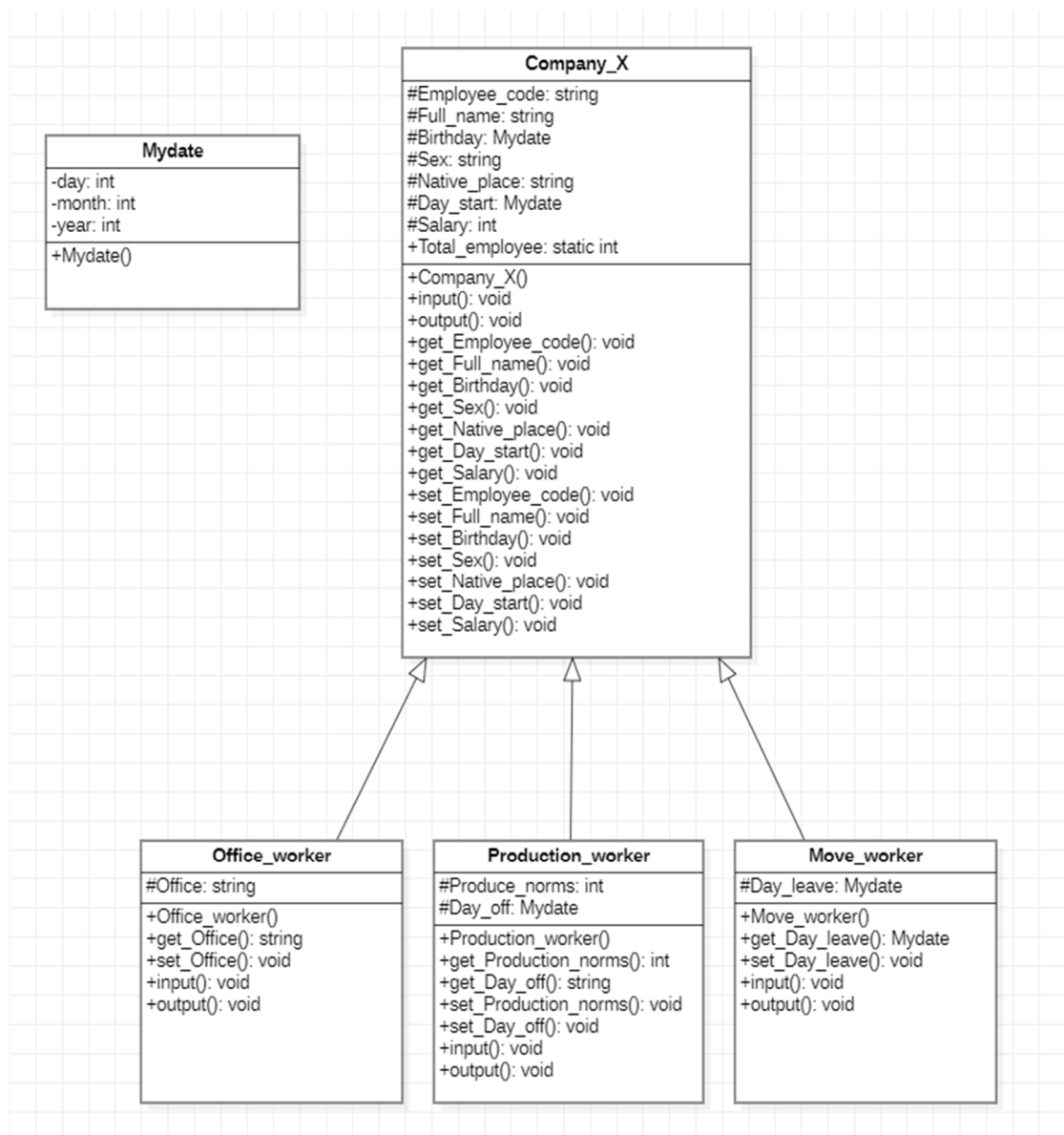# MỤC LỤC

PHẦN I: NỘI DUNG BÁO CÁO

1. Đề tài:

Trong một Công ty sản xuất X, việc quản lý nhân sự được thực hiện như sau: tất cả nhân viên đều được quản lý Họ và tên, Mã nhân viên, Ngày sinh, Giới tính, Quê quán, Ngày vào công ty, Lương, Tổng số nhân viên trong Công ty. Đối tượng Nhân viên văn phòng được quản lý thêm Phòng, đối tượng Công nhân sản xuất được quản lý thêm Định mức số lượng sản phẩm. Đối với đối tượng Công nhân, nếu là nam ngày nghỉ quy định là ngày chủ nhật, còn đối với nữ có thể đăng ký 1 ngày nghỉ bất kỳ trong tuần. Ngoài ra, Công ty còn lưu thông tin nhân viên sau khi chuyển đi khỏi Công ty, bao gồm Họ và tên, Mã nhân viên, Ngày sinh, Giới tính, Ngày chuyển đi. Viết chương trình quản lý nhân sự cho Công ty X bao gồm các công việc cơ bản sau: Quản lý danh sách nhân viên; Hiển thị thông tin nhân viên; Thống kê số nhân viên nữ đăng ký nghỉ theo thứ trong tuần, thống kê nhân viên chuyển đi,…

2. Yêu cầu

+ Phân tích, thiết kế các lớp;

+ Biểu diễn các lớp, sơ đồ kế thừa nếu có (có thể sử dụng công cụ UML);

+ Xác định lớp cơ sở ảo, lớp cơ sở trừu tượng, hàm xử lý liên kết tương ứng bội (nếu có);

+ Sử dụng ngôn ngữ C++ để viết chương trình;

+ Dữ liệu vào/ ra sử dụng tệp văn bản;

+ Báo cáo toàn bộ nội dung đã thực hiện bằng bản Word *(Font: Times New Roman; Cỡ chữ: 13; Lề trên: 2 cm; dưới: 2cm; trái 3 cm; phải 2 cm; dãn dòng Multiple 1.3; dãn đoạn: 3pt; Mục lục tự động; Có tiêu đề đầu trang hoặc cuối trang với nội dung: Đồ án kết thúc học phần Lập trình hướng đối tượng; Đánh số trang; Căn lề hợp lý; Sửa lỗi chính tả.)*

3. Sơ đồ kế thừa

Mydate

-day: int
-month: int
-year: int

+Mydate()

Company_X

#Employee_code: string
#Full_name: string
#Birthday: Mydate
#Sex: string
#Native_place: string
#Day_start: Mydate
#Salary: int
+Total_employee: static int

+Company_X()
+input(): void
+output(): void
+get_Employee_code(): void
+get_Full_name(): void
+get_Birthday(): void
+get_Sex(): void
+get_Native_place(): void
+get_Day_start(): void
+get_Salary(): void
+set_Employee_code(): void
+set_Full_name(): void
+set_Birthday(): void
+set_Sex(): void
+set_Native_place(): void
+set_Day_start(): void
+set_Salary(): void

Office_worker

#Office: string

+Office_worker()
+get_Office(): string
+set_Office(): void
+input(): void
+output(): void

Production_worker

#Produce_norms: int
#Day_off: Mydate

+Production_worker()
+get_Production_norms(): int
+get_Day_off(): string
+set_Production_norms(): void
+set_Day_off(): void
+input(): void
+output(): void

Move_worker

#Day_leave: Mydate

+Move_worker()
+get_Day_leave(): Mydate
+set_Day_leave(): void
+input(): void
+output(): void

4. Cấu trúc các tệp dữ liệu vào/ ra

4.1. Cấu trúc tệp dữ liệu vào
- Tên file: Office_worker_input.txt
- Chức năng: Lưu thông tin nhân viên văn phòng
- Cấu trúc của file: Bao gồm các thông tin:
  o Mã nhân viên;
  o Họ và tên nhân viên;
  o Ngày sinh;
  o Giới tính;
  o Quê quán;
  o Ngày vào làm;
  o Lương;
  o Công việc văn phòng.
- Tên file: Production_worker_input.txt
- Chức năng: Lưu thông tin công nhân sản xuất
- Cấu trúc của file: Bao gồm các thông tin:
  o Mã nhân viên;
  o Họ và tên nhân viên;
  o Ngày sinh;
  o Giới tính;
  o Quê quán;
  o Ngày vào làm;
  o Lương;
  o Định mức sản phẩm;
  o Ngày nghỉ.
- Ngày nghỉ. Tên file: Move_worker_input.txt
- Chức năng: Lưu thông tin nhân viên chuyển đi
- Cấu trúc của file: Bao gồm các thông tin:
  o Mã nhân viên;
  o Họ và tên nhân viên;
  o Ngày sinh;
  o Giới tính;
  o Ngày chuyển đi.

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4.2. Cấu trúc tệp dữ liệu ra

- Tên file: File_list_worker.txt
- Chức năng: Lưu danh sách nhân viên của công ty
- Cấu trúc file: Bao gồm các danh sách:
    - Danh sách nhân viên văn phòng;
    - Danh sách công nhân sản xuất;
    - Danh sách nhân viên chuyển đi.
- Tên file: File_output_statistical.txt
- Chức năng: Lưu danh sách nhân viên thống kê theo các tiêu chí
- Cấu trúc file: Bao gồm các danh sách:
    - Danh sách nhân viên;
    - Danh sách nhân viên nam;
    - Danh sách nhân viên nữ;
    - Danh sách nhân viên xếp theo ngày sinh;
    - Danh sách nhân viên theo tiền lương;
    - Danh sách nhân viên theo văn phòng;
    - Danh sách nhân viên theo ngày làm công ty;
    - Danh sách nhân viên theo ngày nghỉ;
    - Danh sách ngày nghỉ công nhân nữ;
    - Danh sách nhân viên chuyển đi.

5. Code

```cpp
#include <bits/stdc++.h>
#include <Windows.h>

using namespace std;

// Tao file doc va ghi du lieu
ifstream file_office("Office_worker_input.txt", ios::in);
ifstream file_production("Production_worker_input.txt", ios::in);
ifstream file_move("Move_worker_input.txt", ios::in);
ofstream file_list("File_list_worker.txt", ios::out);
ofstream file_statistical("File_output_statistical.txt", ios::out);

void TextColor(int x){
    HANDLE h= GetStdHandle(STD_OUTPUT_HANDLE);
    SetConsoleTextAttribute(h, x);
}

void MENU(){
    TextColor(11);
    cout << "\t\t\t\t+--------------------------------+\n";
    cout << "\t\t\t\t|            MENU                |\n";
    cout << "\t\t\t\t+--------------------------------+\n";
    cout << "\t\t\t\t|  1. Tim kiem nhan vien.         |\n";
    cout << "\t\t\t\t|  2. Xem danh sach nhan vien.    |\n";
    cout << "\t\t\t\t|  3. Them nhan vien.             |\n";
    cout << "\t\t\t\t|  4. Xoa nhan vien.              |\n";
    cout << "\t\t\t\t|  5. Chinh sua thong tin.        |\n";
```

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```cpp
        cout << "\t\t\t\t|  6. Thong ke.                |\n";
        cout << "\t\t\t\t|  0. Thoat.                |\n";
        cout << "\t\t\t\t+-------------------------------+\n";
}


// Menu cac lop nhan vien
void MENU_company(){
        cout << "\n\t1. Nhan vien van phong.\n";
        cout << "\t2. Nhan vien san xuat.\n";
        cout << "\t3. Nhan vien chuyen di khoi cong ty.\n";
}


// Menu cac tieu chi thong ke
void MENU_statistical(){
        cout << "\t0. Thong ke nhan vien trong cong ty.\n";
        cout << "\t1. Thong ke theo gioi tinh.\n";
        cout << "\t2. Thong ke theo nam sinh.\n";
        cout << "\t3. Thong ke theo tien luong.\n";
        cout << "\t4. Thong ke theo van phong.\n";
        cout << "\t5. Thong ke theo ngay vao cong ty.\n";
        cout << "\t6. Thong ke theo ngay nghi.\n";
        cout << "\t7. Thong ke theo ngay nghi cong nhan nu.\n";
        cout << "\t8. Thong ke nhan vien chuyen di khoi cong ty.\n";
}


// Tieu de cua nhan vien van phong
void Header_office(){
        TextColor(7);
```
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```cpp
        cout << "
_____
_____
_____ \n";
        cout << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh|        Que quan        | Ngay vao cong ty | Luong (dong) |    Van phong   |\n";
        cout << "|---------+-------------------------+--------------+---------+----------------------------------------+------------------+--------------+----------------|\n";
}


void Footer_office(){
        cout << "|_____|_____|_____|_____|_____|_____|_____|_____|\n";
}


// Tieu de cua cong nhan san xuat
void Header_production(){
        TextColor(7);
        cout << "
_____
_____
_____ \n";
        cout << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh|        Que quan        | Ngay vao cong ty | Luong (dong) | Dinh muc sp (sp/thang) | Ngay nghi |\n";
        cout << "|---------+-------------------------+--------------+---------+----------------------------------------+------------------+--------------+------------------------+-----------|\n";
}


void Footer_production(){
```

```cpp
        cout <<
"|_____|_____|_____|_____|_____
_____|_____|_____|_____
_____|_____|\n";
}


// Tieu de cua nhan vien chuyen di khoi cong ty
void Header_move(){
        TextColor(7);
        cout << "
_____
_____ \n";
        cout << "|  Ma nv  |      Ho va ten       | Ngay sinh  |Gioi tinh| Ngay chuyen di
|\n";
        cout << "|---------+-------------------------+-------------+---------+-----------------
|\n";
}


void Footer_move(){
        cout <<
"|_____|_____|_____|_____|_____
_____|\n";
}


// Lop Mydate xu ly ngay thang nam
class Mydate {
        public:
                int day, month, year;
                Mydate(){}
                friend istream& operator >> (istream& is, Mydate &mydate){
                        is >> mydate.day >> mydate.month >> mydate.year;
```
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```cpp
                return is;

        }


        friend ostream& operator << (ostream& os, Mydate &mydate){
                os << mydate.day << "/" << setw(2) << mydate.month << "/" <<
setw(4) << mydate.year;

                return os;

        }


        bool operator > (Mydate mydate){
                if(year > mydate.year) return true;
                else if(year < mydate.year) return false;


                if(month > mydate.month) return true;
                else if(month < mydate.month) return false;


                if(day > mydate.day) return true;
                else return false;

        }
};


// Lop Company_X quan ly nhan vien cong ty X
class Company_X {
        protected:
                string Employee_code; // Ma nhan vien
                string Full_name; // Ho va ten
                Mydate Birthday; // Ngay sinh
                string Sex; // Gioi tinh
```

```cpp
        string Native_place; // Que quan
        Mydate Day_start; // Ngay vao lam
        int Salary; // Tien luong
public:
        static int Total_employee;

        // Lay du lieu nhan vien
        string get_Employee_code(){
                return Employee_code;
        }
        string get_Full_name(){
                return Full_name;
        }
        Mydate get_Birthday(){
                return Birthday;
        }
        string get_Sex(){
                return Sex;
        }
        string get_Native_place(){
                return Native_place;
        }
        Mydate get_Day_start(){
                return Day_start;
        }
        int get_Salary(){
                return Salary;
        }
```

```cpp
// Thay doi du lieu nhan vien
void set_Employee_code(string employee_code){
    Employee_code = employee_code;
}
void set_Full_name(string full_name){
    Full_name = full_name;
}
void set_Birthday(Mydate birthday){
    Birthday = birthday;
}
void set_Sex(string sex){
    Sex = sex;
}
void set_Native_place(string native_place){
    Native_place = native_place;
}
void set_Day_start(Mydate day_start){
    Day_start = day_start;
}
void set_Salary(int salary){
    Salary = salary;
}

Company_X(){}
void input(){
    cout << "Nhap ma nhan vien: ";
    getline(cin, Employee_code);
```

```cpp
            cout << "Nhap Ten: ";
            getline(cin, Full_name);
            cout << "Nhap ngay sinh: ";
            cin >> Birthday;
            cin.ignore();
            cout << "Nhap gioi tinh: ";
            getline(cin, Sex);
            cout << "Nhap que quan: ";
            getline(cin, Native_place);
            cout << "Nhap ngay vao lam: ";
            cin >> Day_start;
            cout << "Nhap tien luong: ";
            cin >> Salary;
            cin.ignore();
            Total_employee++;
    }
    void output(){
            cout << "|" << setw(8) << Employee_code << " |";
            cout << setw(26) << Full_name << " |";
            cout << setw(4) << Birthday << "  |";
            cout << setw(6) << Sex << "   |";
            cout << setw(37) << Native_place << " |";
            cout << setw(6) << Day_start << "    |";
            cout << setw(13) << Salary << " |" << endl;
    }
    friend istream& operator >> (istream& is, Company_X &company_x){
            // cout << "Nhap ma nhan vien: ";
            getline(is, company_x.Employee_code);
```

```cpp
            // cout << "Nhap Ten: ";
            getline(is, company_x.Full_name);
            // cout << "Nhap ngay sinh: ";
            is >> company_x.Birthday;
            is.ignore();
            // cout << "Nhap gioi tinh: ";
            getline(is, company_x.Sex);
            // cout << "Nhap que quan: ";
            getline(is, company_x.Native_place);
            // cout << "Nhap ngay vao lam: ";
            is >> company_x.Day_start;
            // cout << "Nhap tien luong: ";
            is >> company_x.Salary;
            is.ignore();
            company_x.Total_employee++;
            return is;
    }
    friend ostream& operator << (ostream& os, Company_X &company_x){
            os << "|" << setw(8) << company_x.Employee_code << " |";
            os << setw(26) << company_x.Full_name << " |";
            os << setw(4) << company_x.Birthday << "  |";
            os << setw(6) << company_x.Sex << "   |";
            os << setw(37) << company_x.Native_place << " |";
            os << setw(6) << company_x.Day_start << "    |";
            os << setw(13) << company_x.Salary << " |" << endl;
            return os;
    }
    bool operator > (const Company_X company_x){
```
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```cpp
                    string name1, name2;
                    for(int i = Full_name.length() - 1; ; i--){
                            char tmp_char = Full_name[i];
                            name1 += tmp_char;
                            if(Full_name[i-1] == ' '){
                                    break;
                            }
                    }
                    for(int i = company_x.Full_name.length() - 1; ; i--){
                            char tmp_char = company_x.Full_name[i];
                            name2 += tmp_char;
                            if(company_x.Full_name[i-1] == ' '){
                                    break;
                            }
                    }
                    reverse(name1.begin(), name1.end()); // đảo ngược chuỗi
                    reverse(name2.begin(), name2.end()); // đảo ngược chuỗi
                    return name1 > name2;
            }
};


int Company_X::Total_employee = 0;


// Lop Move_worker quan ly nhan vien chuyen di khoi cong ty
class Move_worker : public Company_X {
        protected:
                Mydate Day_leave;
        public:
```

```cpp
Move_worker(){}
// Lay du lieu nhan vien chuyen di khoi cong ty
Mydate get_Day_leave(){
        return Day_leave;
}

// Thay doi du lieu chuyen di khoi cong ty
void set_Day_leave(Mydate day_leave){
        Day_leave = day_leave;
}

void input(){
        // cout << "Nhap ma nhan vien: ";
        getline(cin, Employee_code);
        // cout << "Nhap Ten: ";
        getline(cin, Full_name);
        // cout << "Nhap ngay sinh: ";
        cin >> Birthday;
        cin.ignore();
        // cout << "Nhap gioi tinh: ";
        getline(cin, Sex);
        // cout << "Nhap ngay chuyen di: ";
        cin >> Day_leave;
        cin.ignore();
}
void output(){
        cout << "|" << setw(8) << Employee_code << " |";
        cout << setw(26) << Full_name << " |";
```
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```cpp
                cout << setw(4) << Birthday << "  |";
                cout << setw(6) << Sex << "   |";
                cout << setw(6) << Day_leave << "    |" << endl;
        }
        friend istream& operator >> (istream& is, Move_worker &move_worker){
                // cout << "Nhap ma nhan vien: ";
                getline(is, move_worker.Employee_code);
                // cout << "Nhap Ten: ";
                getline(is, move_worker.Full_name);
                // cout << "Nhap ngay sinh: ";
                is >> move_worker.Birthday;
                is.ignore();
                // cout << "Nhap gioi tinh: ";
                getline(is, move_worker.Sex);
                // cout << "Nhap ngay chuyen di: ";
                is >> move_worker.Day_leave;
                is.ignore();
                return is;
        }
        friend ostream& operator << (ostream& os, Move_worker
&move_worker){
                os << "|" << setw(8) << move_worker.Employee_code << " |";
                os << setw(26) << move_worker.Full_name << " |";
                os << setw(4) << move_worker.Birthday << "  |";
                os << setw(6) << move_worker.Sex << "   |";
                os << setw(6) << move_worker.Day_leave << "    |" << endl;
                return os;
        }
```

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```cpp
bool operator > (const Move_worker move_worker){
    string name1, name2;
    for(int i = Full_name.length() - 1; ; i--){
        char tmp_char = Full_name[i];
        name1 += tmp_char;
        if(Full_name[i-1] == ' '){
            break;
        }
    }
    for(int i = move_worker.Full_name.length() - 1; ; i--){
        char tmp_char = move_worker.Full_name[i];
        name2 += tmp_char;
        if(move_worker.Full_name[i-1] == ' '){
            break;
        }
    }
    reverse(name1.begin(), name1.end()); // đảo ngược chuỗi
    reverse(name2.begin(), name2.end()); // đảo ngược chuỗi
    return name1 > name2;
}
friend void Find(Move_worker *mov_work, int size, string worker_code,
int &check);
friend void Add_employee_move(Move_worker* &mov_work, int &size,
Move_worker move_worker);
friend void Change_file(Move_worker *mov_work, int size);
};
// Tim kiem nhan vien chuyen di khoi cong ty
void Find(Move_worker *mov_work, int size, string worker_code, int &check){
```

```cpp
        TextColor(7);
        for(int i=0; i<size; i++){
                if(worker_code == mov_work[i].Employee_code){
                        cout << "\n\tNhan vien chuyen di khoi cong ty.\n";
                        Header_move();
                        cout << mov_work[i];
                        Footer_move();
                        check = 1;
                        return;
                }
        }
        check = 0;
}
// Xuat danh sach nhan vien chuyen di khoi cong ty ra man hinh
void List_move(Move_worker *mov_work, int size){
        TextColor(7);
        cout << "                NHAN VIEN CHUYEN DI KHOI CONG TY\n";
        cout << "Tong co " << size << " nhan vien.\n";
        Header_move();
        for(int i=0; i<size; i++){
                cout << mov_work[i];
        }
        Footer_move();
}
// Them nhan vien chuyen di khoi cong ty
void Add_employee_move(Move_worker* &mov_work, int &size, Move_worker
move_worker){
        if(move_worker.Employee_code == ""){
```

```
            return;
    }
    int new_size = size + 1;
    Move_worker *_mov_work = new Move_worker[new_size];
    for(int i=0; i<size; i++){
            _mov_work[i] = mov_work[i];
    }


    // Luu thong tin doi tuong xoa
    _mov_work[new_size-1] = move_worker;


    delete[] mov_work;
    mov_work = _mov_work;
    size = new_size;
}
// Sua file doc du lieu
void Change_file(Move_worker *mov_work, int size){
    ofstream file_change("Move_worker_input.txt", ios::out);
    file_change << size << endl;
    for(int i=0; i<size; i++){
            file_change << mov_work[i].Employee_code << endl;
            file_change << mov_work[i].Full_name << endl;
            file_change << mov_work[i].Birthday.day << " " <<
mov_work[i].Birthday.month << " " << mov_work[i].Birthday.year << endl;
            file_change << mov_work[i].Sex << endl;
            file_change << mov_work[i].Day_leave.day << " " <<
mov_work[i].Day_leave.month << " " << mov_work[i].Day_leave.year << endl;
    }
```

```cpp
        file_change.close();
}



// Lop Office_worker quan ly nhan vien van phong
class Office_worker : public Company_X {
        protected:
                string Office; // Van phong
        public:
                Office_worker(){}
                // Lay du lieu nhan vien van phong
                string get_Office(){
                        return Office;
                }


                // Thay doi du lieu nhan vien van phong
                void set_Office(string office){
                        Office = office;
                }


                void input(){
                        Company_X::input();
                        cout << "Nhap van phong: ";
                        getline(cin, Office);
                }
                void output(){
                        Company_X::output();
                        cout << "Van phong: " << Office << endl;
```

```cpp
        }
        friend istream& operator >> (istream& is, Office_worker &office_worker){
                // cout << "Nhap ma nhan vien: ";
                getline(is, office_worker.Employee_code);
                // cout << "Nhap Ten: ";
                getline(is, office_worker.Full_name);
                // cout << "Nhap ngay sinh: ";
                is >> office_worker.Birthday;
                is.ignore();
                // cout << "Nhap gioi tinh: ";
                getline(is, office_worker.Sex);
                // cout << "Nhap que quan: ";
                getline(is, office_worker.Native_place);
                // cout << "Nhap ngay vao lam: ";
                is >> office_worker.Day_start;
                // cout << "Nhap tien luong: ";
                is >> office_worker.Salary;
                is.ignore();
                // cout << "Nhap van phong: ";
                getline(is, office_worker.Office);
                office_worker.Total_employee++;
                return is;
        }
        friend ostream& operator << (ostream& os, Office_worker
&office_worker){
                os << "|" << setw(8) << office_worker.Employee_code << " |";
                os << setw(26) << office_worker.Full_name << " |";
                os << setw(4) << office_worker.Birthday << "  |";
```

```cpp
        os << setw(6) << office_worker.Sex << "    |";
        os << setw(37) << office_worker.Native_place << " |";
        os << setw(6) << office_worker.Day_start << "    |";
        os << setw(13) << office_worker.Salary << " |";
        os << setw(16) << office_worker.Office << " |" << endl;
        return os;
}
bool operator > (const Office_worker office_worker){
        string name1, name2;
        for(int i = Full_name.length() - 1; ; i--){
                char tmp_char = Full_name[i];
                name1 += tmp_char;
                if(Full_name[i-1] == ' '){
                        break;
                }
        }
        for(int i = office_worker.Full_name.length() - 1; ; i--){
                char tmp_char = office_worker.Full_name[i];
                name2 += tmp_char;
                if(office_worker.Full_name[i-1] == ' '){
                        break;
                }
        }
        reverse(name1.begin(), name1.end()); // đảo ngược chuỗi
        reverse(name2.begin(), name2.end()); // đảo ngược chuỗi
        return name1 > name2;
}
```

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```cpp
        friend void Find(Office_worker *off_work, int size, string worker_code, int &check);
        friend void Add_employee_office(Office_worker* &off_work, int &size, int &mark_office_code);
        friend void Delete_employee_office(Office_worker* &off_work, int &size, Move_worker &move_worker);
        friend void Edit_employee_office(Office_worker* &off_work, int size);
        friend void Change_file(Office_worker *off_work, int size, int mark_office_code);
};
// Tim kiem nhan vien van phong
void Find(Office_worker *off_work, int size, string worker_code, int &check){
    TextColor(7);
    for(int i=0; i<size; i++){
        if(worker_code == off_work[i].Employee_code){
            cout << "\n\tNhan vien van phong.\n";
            Header_office();
            cout << off_work[i];
            Footer_office();
            check = 1;
            return;
        }
    }
    check = 0;
}
// Xuat danh sach nhan vien van phong ra man hinh
void List_office(Office_worker *off_work, int size){
    TextColor(7);
```

```cpp
    cout << "\n                              DANH SACH NHAN VIEN VAN
PHONG\n";

    cout << "Tong co " << size << " nhan vien.\n";

    Header_office();

    for(int i=0; i<size; i++){

            cout << off_work[i];

    }

    Footer_office();

}

// Them nhan vien van phong

void Add_employee_office(Office_worker* &off_work, int &size, int
&mark_office_code){

    int new_size = size + 1;

    mark_office_code++;

    Office_worker *_off_work = new Office_worker[new_size];

    for(int i=0; i<size; i++){

            _off_work[i] = off_work[i];

    }


    List_office(off_work, size);


    // Tao ma nhan vien

    _off_work[new_size-1].Employee_code = "";

    string tmp_code = to_string(mark_office_code);

    if(mark_office_code < 10){

            _off_work[new_size-1].Employee_code = "OFF00" + tmp_code;

    }

    else if(mark_office_code >=10 && mark_office_code < 100){
```

```cpp
        _off_work[new_size-1].Employee_code = "OFF0" + tmp_code;
}
else {
        _off_work[new_size-1].Employee_code = "OFF" + tmp_code;
}


cout << "Nhap Ten: ";
getline(cin, _off_work[new_size-1].Full_name);
cout << "Nhap ngay sinh: ";
cin >> _off_work[new_size-1].Birthday;
cin.ignore();
cout << "Nhap gioi tinh: ";
getline(cin, _off_work[new_size-1].Sex);
cout << "Nhap que quan: ";
getline(cin, _off_work[new_size-1].Native_place);
do{
        cout << "Nhap ngay vao lam: ";
        cin >> _off_work[new_size-1].Day_start;
        if(_off_work[new_size-1].Birthday > _off_work[new_size-1].Day_start){
                cout << "Ngay vao lam khong hop le. Vui long nhap lai!\n";
        }
} while(_off_work[new_size-1].Birthday > _off_work[new_size-1].Day_start);
cout << "Nhap tien luong: ";
cin >> _off_work[new_size-1].Salary;
cin.ignore();
cout << "Nhap van phong: ";
getline(cin, _off_work[new_size-1].Office);
delete[] off_work;
```

```cpp
        off_work = _off_work;

        size = new_size;

        Company_X::Total_employee++; // Cong them 1 nhan vien vao tong so nhan vien
cua cong ty X

        cout << "***   Them thanh cong   ***\n";

}
// Xoa nhan vien van phong

void Delete_employee_office(Office_worker* &off_work, int &size, Move_worker
&move_worker){

        int new_size = size - 1;

        Office_worker *_off_work = new Office_worker[new_size];


        List_office(off_work, size);


        int check;

        do{

                string employee_code;

                cout << "Nhap ma nhan vien xoa: ";

                getline(cin, employee_code);

                for(int i=0; i<size; i++){

                        if(employee_code == off_work[i].Employee_code){

                                // Lay thong tin doi tuong xoa


move_worker.set_Employee_code(off_work[i].Employee_code);

                                move_worker.set_Full_name(off_work[i].Full_name);

                                move_worker.set_Birthday(off_work[i].Birthday);

                                move_worker.set_Sex(off_work[i].Sex);

                                Mydate day_leave;

                                cout << "Nhap ngay chuyen di: ";
```

```cpp
                cin >> day_leave;

                cin.ignore();

                move_worker.set_Day_leave(day_leave);

                for(int j=i; j<size-1; j++){

                        off_work[j] = off_work[j+1];

                }


                check = 1;

                break;

        }else {

                check = 0;

        }

    }

    if(!check){

            string select2;

            cout << "Ma nhan vien khong dung.\n";

            cout << "Chon 0 de thoat / so bat ky de tiep tuc : ";

            getline(cin, select2);

            if(select2 == "0"){

                    return;

            }

            cout << "Vui long nhap lai!\n";

    }

} while(!check);


for(int i=0; i<new_size; i++){

    _off_work[i] = off_work[i];

}
```

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```cpp
        delete[] off_work;
        off_work = _off_work;
        size = new_size;
        Company_X::Total_employee--;
        cout << "***   Xoa thanh cong   ***\n";
}
// Chinh sua thong tin nhan vien
void Edit_employee_office(Office_worker* &off_work, int size){

        List_office(off_work, size);

        string employee_code;
        int check;
        do{
                check = 0;
                cout << "Nhap ma nhan vien chinh sua: ";
                getline(cin, employee_code);
                for(int i=0; i<size; i++){
                        if(off_work[i].Employee_code == employee_code){
                                check = 1;
                                cout << "Chinh sua thong tin:\n";
                                cout << "Nhap Ten: ";
                                getline(cin, off_work[i].Full_name);
                                cout << "Nhap ngay sinh: ";
                                cin >> off_work[i].Birthday;
                                cin.ignore();
                                cout << "Nhap gioi tinh: ";
                                getline(cin, off_work[i].Sex);
```
30

```cpp
                    cout << "Nhap que quan: ";
                    getline(cin, off_work[i].Native_place);
                    do{
                            cout << "Nhap ngay vao lam: ";
                            cin >> off_work[i].Day_start;
                            if(off_work[i].Birthday > off_work[i].Day_start){
                                    cout << "Ngay vao lam khong hop le. Vui long
nhap lai!\n";

                            }
                    } while(off_work[i].Birthday > off_work[i].Day_start);
                    cout << "Nhap tien luong: ";
                    cin >> off_work[i].Salary;
                    cin.ignore();
                    cout << "Nhap van phong: ";
                    getline(cin, off_work[i].Office);
                    cout << "***   Chinh sua thanh cong   ***\n";
            }
    }
    if(!check){
            string select2;
            cout << "Ma nhan vien khong dung.\n";
            cout << "Chon 0 de thoat / so bat ky de tiep tuc : ";
            getline(cin, select2);
            if(select2 == "0"){
                    return;
            }
            cout << "Vui long nhap lai!\n";
    }
```

```cpp
        } while(!check);
}
// Sua file doc du lieu nhan vien van phong
void Change_file(Office_worker *off_work, int size, int mark_office_code){
        ofstream file_change("Office_worker_input.txt", ios::out);
        file_change << mark_office_code << endl;
        file_change << size << endl;
        for(int i=0; i<size; i++){
                file_change << off_work[i].Employee_code << endl;
                file_change << off_work[i].Full_name << endl;
                file_change << off_work[i].Birthday.day << " " <<
off_work[i].Birthday.month << " " << off_work[i].Birthday.year << endl;
                file_change << off_work[i].Sex << endl;
                file_change << off_work[i].Native_place << endl;
                file_change << off_work[i].Day_start.day << " " <<
off_work[i].Day_start.month << " " << off_work[i].Day_start.year << endl;
                file_change << off_work[i].Salary << endl;
                file_change << off_work[i].Office << endl;
        }
        file_change.close();
}


// Lop Production_worker quan ly cong nhan san xuat
class Production_worker : public Company_X {
        protected:
                int Product_norms; // Dinh muc san pham (san pham/ thang)
                string Day_off; // Ngay nghi trong tuan
```

```cpp
public:
        // Lay du lieu cong nhan san xuat
        int get_Product_norms(){
                return Product_norms;
        }
        string get_Day_off(){
                return Day_off;
        }


        // Thay doi du lieu cong nhan san xuat
        void get_Product_norms(int product_norms){
                Product_norms = product_norms;
        }
        void get_Day_off(string day_off){
                Day_off = day_off;
        }


        Production_worker(){}
        void input(){
                Company_X::input();
                cout << "Nhap dinh muc san pham: ";
                cin >> Product_norms;
                cin.ignore();
                cout << "Nhap ngay nghi: ";
                getline(cin, Day_off);
        }
        void output(){
                Company_X::output();
```

```cpp
                cout << "Dinh muc san pham: " << Product_norms << endl;
                cout << "Ngay nghi: " << Day_off << endl;
        }
        friend istream& operator >> (istream& is, Production_worker
&production_worker){
                // cout << "Nhap ma nhan vien: ";
                getline(is, production_worker.Employee_code);
                // cout << "Nhap Ten: ";
                getline(is, production_worker.Full_name);
                // cout << "Nhap ngay sinh: ";
                is >> production_worker.Birthday;
                is.ignore();
                // cout << "Nhap gioi tinh: ";
                getline(is, production_worker.Sex);
                // cout << "Nhap que quan: ";
                getline(is, production_worker.Native_place);
                // cout << "Nhap ngay vao lam: ";
                is >> production_worker.Day_start;
                // cout << "Nhap tien luong: ";
                is >> production_worker.Salary;
                // cout << "Nhap dinh muc san pham: ";
                is >> production_worker.Product_norms;
                is.ignore();
                // cout << "Nhap ngay nghi: ";
                getline(is, production_worker.Day_off);
                production_worker.Total_employee++;
                return is;
        }
```

```cpp
        friend ostream& operator << (ostream& os, Production_worker
&production_worker){
                os << "|" << setw(8) << production_worker.Employee_code << " |";
                os << setw(26) << production_worker.Full_name << " |";
                os << setw(4) << production_worker.Birthday << "  |";
                os << setw(6) << production_worker.Sex << "   |";
                os << setw(37) << production_worker.Native_place << " |";
                os << setw(6) << production_worker.Day_start << "    |";
                os << setw(13) << production_worker.Salary << " |";
                os << setw(23) << production_worker.Product_norms << " |";
                os << setw(10) << production_worker.Day_off << " |" << endl;
                return os;
        }
        bool operator > (const Production_worker production_worker){
                string name1, name2;
                for(int i = Full_name.length() - 1; ; i--){
                        char tmp_char = Full_name[i];
                        name1 += tmp_char;
                        if(Full_name[i-1] == ' '){
                                break;
                        }
                }
                for(int i = production_worker.Full_name.length() - 1; ; i--){
                        char tmp_char = production_worker.Full_name[i];
                        name2 += tmp_char;
                        if(production_worker.Full_name[i-1] == ' '){
                                break;
                        }
```

```
                }
                reverse(name1.begin(), name1.end()); // đảo ngược chuỗi
                reverse(name2.begin(), name2.end()); // đảo ngược chuỗi
                return name1 > name2;
            }
            friend void Find(Production_worker *pro_work, int size, string
worker_code, int &check);
            friend void Add_employee_production(Production_worker* &pro_work, int
&size, int &mark_production_code);
            friend void Delete_employee_production(Production_worker* &pro_work,
int &size, Move_worker &move_worker);
            friend void Edit_employee_production(Production_worker* &pro_work, int
size);
            friend void Change_file(Production_worker *pro_work, int size,  int
mark_production_code);
};
// Tim kiem cong nhan san xuat
void Find(Production_worker *pro_work, int size, string worker_code, int &check){
    TextColor(7);
    for(int i=0; i<size; i++){
            if(worker_code == pro_work[i].Employee_code){
                cout << "\n\tCong nhan san xuat.\n";
                Header_production();
                cout << pro_work[i];
                Footer_production();
                check = 1;
                return;
            }
    }
```

```
            check = 0;
    }
// Xuat danh sach cong nhan san xuat ra man hinh
void List_production(Production_worker *pro_work, int size){
        TextColor(7);
        cout << "\n                                DANH SACH CONG NHAN SAN
XUAT\n";
        cout << "Tong co " << size << " nhan vien.\n";
        Header_production();
        for(int i=0; i<size; i++){
                cout << pro_work[i];
        }
        Footer_production();
}
// Them cong nhan san xuat
void Add_employee_production(Production_worker* &pro_work, int &size, int
&mark_production_code){
        int new_size = size + 1;
        mark_production_code++;
        Production_worker *_pro_work = new Production_worker[new_size];
        for(int i=0; i<size; i++){
                _pro_work[i] = pro_work[i];
        }


        List_production(pro_work, size);


        // Tao ma nhan vien
        _pro_work[new_size-1].Employee_code = "";
```

```cpp
string tmp_code = to_string(mark_production_code);
if(mark_production_code < 10){
        _pro_work[new_size-1].Employee_code = "PRO00" + tmp_code;
}
else if(mark_production_code >=10 && mark_production_code < 100){
        _pro_work[new_size-1].Employee_code = "PRO0" + tmp_code;
}
else {
        _pro_work[new_size-1].Employee_code = "PRO" + tmp_code;
}


cout << "Nhap Ten: ";
getline(cin, _pro_work[new_size-1].Full_name);
cout << "Nhap ngay sinh: ";
cin >> _pro_work[new_size-1].Birthday;
cin.ignore();
cout << "Nhap gioi tinh: ";
getline(cin, _pro_work[new_size-1].Sex);
cout << "Nhap que quan: ";
getline(cin, _pro_work[new_size-1].Native_place);
do{
        cout << "Nhap ngay vao lam: ";
        cin >> _pro_work[new_size-1].Day_start;
        if(_pro_work[new_size-1].Birthday > _pro_work[new_size-1].Day_start){
                cout << "Ngay vao lam khong hop le. Vui long nhap lai!\n";
        }
} while(_pro_work[new_size-1].Birthday > _pro_work[new_size-1].Day_start);
cout << "Nhap tien luong: ";
```

```cpp
        cin >> _pro_work[new_size-1].Salary;

        cin.ignore();

        cout << "Nhap dinh muc san pham: ";

        cin >> _pro_work[new_size-1].Product_norms;

        cin.ignore();

        if(_pro_work[new_size-1].Sex == "Nu" || _pro_work[new_size-1].Sex == "nu"){

                cout << "Nhap ngay nghi: ";

                getline(cin, _pro_work[new_size-1].Day_off);

        }else {

                _pro_work[new_size-1].Day_off = "Chu Nhat";

        }

        delete[] pro_work;

        pro_work = _pro_work;

        size = new_size;

        Company_X::Total_employee++; // Cong them 1 nhan vien vao tong so nhan vien
cua cong ty X

        cout << "***   Them thanh cong   ***\n";

}
// Xoa cong nhan san xuat
void Delete_employee_production(Production_worker* &pro_work, int &size,
Move_worker &move_worker){

        int new_size = size - 1;

        Production_worker *_pro_work = new Production_worker[new_size];


        List_production(pro_work, size);


        int check;

        do{
```

```cpp
            string employee_code;
            cout << "Nhap ma cong nhan xoa: ";
            getline(cin, employee_code);
            for(int i=0; i<size; i++){
                    if(employee_code == pro_work[i].Employee_code){
                            // Lay thong tin doi tuong xoa

move_worker.set_Employee_code(pro_work[i].Employee_code);
                            move_worker.set_Full_name(pro_work[i].Full_name);
                            move_worker.set_Birthday(pro_work[i].Birthday);
                            move_worker.set_Sex(pro_work[i].Sex);
                            Mydate day_leave;
                            cout << "Nhap ngay chuyen di: ";
                            cin >> day_leave;
                            cin.ignore();
                            move_worker.set_Day_leave(day_leave);
                            for(int j=i; j<size-1; j++){
                                    pro_work[j] = pro_work[j+1];
                            }

                            check = 0;
                            break;
                    }else {
                            check = 1;
                    }
            }
            if(check){
                    string select2;
```

```cpp
                    cout << "Ma cong nhan khong dung.\n";
                    cout << "Chon 0 de thoat / so bat ky de tiep tuc : ";
                    getline(cin, select2);
                    if(select2 == "0"){
                            return;
                    }
                    cout << "Vui long nhap lai!\n";
            }
        } while(check);


        for(int i=0; i<new_size; i++){
                _pro_work[i] = pro_work[i];
        }
        delete[] pro_work;
        pro_work = _pro_work;
        size = new_size;
        Company_X::Total_employee--;
        cout << "***   Xoa thanh cong   ***\n";
}
// Chinh sua thong tin cong nhan
void Edit_employee_production(Production_worker* &pro_work, int size){

        List_production(pro_work, size);

        string employee_code;
        int check;
        do{
                check = 0;
```

```cpp
cout << "Nhap ma nhan vien chinh sua: ";
getline(cin, employee_code);
for(int i=0; i<size; i++){
    if(pro_work[i].Employee_code == employee_code){
        check = 1;
        cout << "Chinh sua thong tin:\n";
        cout << "Nhap Ten: ";
        getline(cin, pro_work[i].Full_name);
        cout << "Nhap ngay sinh: ";
        cin >> pro_work[i].Birthday;
        cin.ignore();
        cout << "Nhap gioi tinh: ";
        getline(cin, pro_work[i].Sex);
        cout << "Nhap que quan: ";
        getline(cin, pro_work[i].Native_place);
        do{
            cout << "Nhap ngay vao lam: ";
            cin >> pro_work[i].Day_start;
            if(pro_work[i].Birthday > pro_work[i].Day_start){
                cout << "Ngay vao lam khong hop le. Vui long nhap lai!\n";
            }
        } while(pro_work[i].Birthday > pro_work[i].Day_start);
        cout << "Nhap tien luong: ";
        cin >> pro_work[i].Salary;
        cout << "Nhap dinh muc san pham: ";
        cin >> pro_work[i].Product_norms;
        cin.ignore();
```

```cpp
                        if(pro_work[i].Sex == "Nu" || pro_work[i].Sex == "nu"){
                                cout << "Nhap ngay nghi: ";
                                getline(cin, pro_work[i].Day_off);
                        }
                        cout << "***   Chinh sua thanh cong   ***\n";
                }
            }
            if(!check){
                string select2;
                cout << "Ma nhan vien khong dung.\n";
                cout << "Chon 0 de thoat / so bat ky de tiep tuc : ";
                getline(cin, select2);
                if(select2 == "0"){
                        return;
                }
                cout << "Vui long nhap lai!\n";
            }
        } while(!check);
}
// Sua file doc du lieu cong nhan san xuat
void Change_file(Production_worker *pro_work, int size, int mark_production_code){
        ofstream file_change("Production_worker_input.txt", ios::out);
        file_change << mark_production_code << endl;
        file_change << size << endl;
        for(int i=0; i<size; i++){
                file_change << pro_work[i].Employee_code << endl;
                file_change << pro_work[i].Full_name << endl;
```

```cpp
            file_change << pro_work[i].Birthday.day << " " <<
pro_work[i].Birthday.month << " " << pro_work[i].Birthday.year << endl;

            file_change << pro_work[i].Sex << endl;

            file_change << pro_work[i].Native_place << endl;

            file_change << pro_work[i].Day_start.day << " " <<
pro_work[i].Day_start.month << " " << pro_work[i].Day_start.year << endl;

            file_change << pro_work[i].Salary << endl;

            file_change << pro_work[i].Product_norms << endl;

            file_change << pro_work[i].Day_off << endl;

        }

        file_change.close();

}


// Thong ke nhan vien trong cong ty

void Employee_statistical(Office_worker *off_work, int off_num, Production_worker
*pro_work, int pro_num){

        int size = off_num + pro_num;

        Company_X *company_x = new Company_X[size];

        for(int i=0; i<off_num; i++){

                company_x[i].set_Employee_code(off_work[i].get_Employee_code());

                company_x[i].set_Full_name(off_work[i].get_Full_name());

                company_x[i].set_Birthday(off_work[i].get_Birthday());

                company_x[i].set_Sex(off_work[i].get_Sex());

                company_x[i].set_Native_place(off_work[i].get_Native_place());

                company_x[i].set_Day_start(off_work[i].get_Day_start());

                company_x[i].set_Salary(off_work[i].get_Salary());

        }
```

```cpp
        for(int i=off_num; i<size; i++){

                company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

                company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

                company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

                company_x[i].set_Sex(pro_work[i - off_num].get_Sex());

                company_x[i].set_Native_place(pro_work[i -
off_num].get_Native_place());

                company_x[i].set_Day_start(pro_work[i - off_num].get_Day_start());

                company_x[i].set_Salary(pro_work[i - off_num].get_Salary());

        }


        // Sap xep danh sach theo ten Alphabet
        for(int i=size-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(company_x[j] > company_x[j+1]){
                                Company_X tmp_company_x = company_x[j];
                                company_x[j] = company_x[j+1];
                                company_x[j+1] = tmp_company_x;
                        }
                }
        }


        TextColor(7);
        cout << "\n                                DANH SACH NHAN VIEN CONG
TY\n";
        cout << "Tong so: " << Company_X::Total_employee << " nhan vien" << endl;
```

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```cpp
        cout << "
_____
_____\n";
        cout << "| Ma nv |       Ho va ten       | Ngay sinh  |Gioi tinh|           Que quan         | Ngay vao cong ty | Luong (dong) |\n";
        cout << "|--------+--------------------------+--------------+---------+----------------------------------+------------------+--------------|\n";
        for(int i=0; i<size; i++){
            cout << "|" << setw(8) << company_x[i].get_Employee_code() << " |";
            cout << setw(26) << company_x[i].get_Full_name() << " |";
            Mydate tmp_birthday = company_x[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << company_x[i].get_Sex() << "   |";
            cout << setw(37) << company_x[i].get_Native_place() << " |";
            Mydate tmp_day_start = company_x[i].get_Day_start();
            cout << setw(6) << tmp_day_start << "    |";
            cout << setw(13) << company_x[i].get_Salary() << " |" << endl;
        }
        cout << "|_____|_____|_____|_____|_____|_____|_____|\n";
}
// Thong ke theo gioi tinh
void Sex_statistical(Office_worker *off_work, int off_num, Production_worker *pro_work, int pro_num){
    int size = off_num + pro_num;
    Company_X *company_x = new Company_X[size];
    for(int i=0; i<off_num; i++){
        company_x[i].set_Employee_code(off_work[i].get_Employee_code());
        company_x[i].set_Full_name(off_work[i].get_Full_name());
```

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```
                company_x[i].set_Birthday(off_work[i].get_Birthday());

                company_x[i].set_Sex(off_work[i].get_Sex());

        }

        for(int i=off_num; i<size; i++){

                company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

                company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

                company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

                company_x[i].set_Sex(pro_work[i - off_num].get_Sex());

        }


        // Sap xep theo nam sinh
        for(int i=size-1; i>0; i--){

                for(int j=0; j<i; j++){

                        if(company_x[j].get_Birthday() > company_x[j+1].get_Birthday()){

                                Company_X tmp_company_x = company_x[j];

                                company_x[j] = company_x[j+1];

                                company_x[j+1] = tmp_company_x;

                        }

                }

        }


        int Total_male = 0;
        for(int i=0; i<size; i++){

                if(company_x[i].get_Sex() == "Nam"){

                        Total_male++;

                }

        }
```

```cpp
TextColor(7);
cout << "\n                DANH SACH NHAN VIEN NAM\n";
cout << "Tong co " << Total_male << " nam" << endl;
cout << "
_____ \n";
cout << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh|\n";
cout << "|--------+-------------------------+-------------+--------|\n";
for(int i=0; i<size; i++){
        if(company_x[i].get_Sex() == "Nam"){
                cout << "|" << setw(8) << company_x[i].get_Employee_code() << "
|";
                cout << setw(26) << company_x[i].get_Full_name() << " |";
                Mydate tmp_birthday = company_x[i].get_Birthday();
                cout << setw(4) << tmp_birthday << "  |";
                cout << setw(6) << company_x[i].get_Sex() << "   |" << endl;
        }
}


cout <<
"|_____|_____|_____|_____|\n";


cout << "\n                DANH SACH NHAN VIEN NU\n";
cout << "Tong co " << size - Total_male << " nu" << endl;
cout << "
_____ \n";
cout << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh|\n";
cout << "|--------+-------------------------+-------------+--------|\n";
for(int i=0; i<size; i++){
```

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```cpp
            if(company_x[i].get_Sex() == "Nu"){

                cout << "|" << setw(8) << company_x[i].get_Employee_code() << "
|";

                cout << setw(26) << company_x[i].get_Full_name() << " |";

                Mydate tmp_birthday = company_x[i].get_Birthday();

                cout << setw(4) << tmp_birthday << "  |";

                cout << setw(6) << company_x[i].get_Sex() << "   |" << endl;

            }

        }

        cout <<
"|_____|_____|_____|_____|\n";

}
// Thong ke theo nam sinh
void Birthday_statistical(Office_worker *off_work, int off_num, Production_worker
*pro_work, int pro_num){

        int size = off_num + pro_num;

        Company_X *company_x = new Company_X[size];

        for(int i=0; i<off_num; i++){

                company_x[i].set_Employee_code(off_work[i].get_Employee_code());

                company_x[i].set_Full_name(off_work[i].get_Full_name());

                company_x[i].set_Birthday(off_work[i].get_Birthday());

                company_x[i].set_Sex(off_work[i].get_Sex());

        }

        for(int i=off_num; i<size; i++){

                company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

                company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

                company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

                company_x[i].set_Sex(pro_work[i - off_num].get_Sex());
```

```
        }


        // Sap xep theo nam sinh
        for(int i=size-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(company_x[j].get_Birthday() > company_x[j+1].get_Birthday()){
                                Company_X tmp_company_x = company_x[j];
                                company_x[j] = company_x[j+1];
                                company_x[j+1] = tmp_company_x;
                        }
                }
        }


        TextColor(7);
        cout << "\n         DANH SACH NHAN VIEN XEP THEO NGAY SINH\n";
        cout << "
_____ \n";
        cout << "| Ma nv |      Ho va ten        | Ngay sinh  |Gioi tinh|\n";
        cout << "|--------+-------------------------+-------------+--------|\n";
        for(int i=0; i<size; i++){
                cout << "|" << setw(8) << company_x[i].get_Employee_code() << " |";
                cout << setw(26) << company_x[i].get_Full_name() << " |";
                Mydate tmp_birthday = company_x[i].get_Birthday();
                cout << setw(4) << tmp_birthday << "  |";
                cout << setw(6) << company_x[i].get_Sex() << "   |" << endl;
        }
        cout <<
"|_____|_____|_____|_____|\n";
```

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```
}
// Thong ke theo tien luong
void Salary_statistical(Office_worker *off_work, int off_num, Production_worker
*pro_work, int pro_num){
        int size = off_num + pro_num;
        Company_X *company_x = new Company_X[size];
        for(int i=0; i<off_num; i++){
                company_x[i].set_Employee_code(off_work[i].get_Employee_code());
                company_x[i].set_Full_name(off_work[i].get_Full_name());
                company_x[i].set_Birthday(off_work[i].get_Birthday());
                company_x[i].set_Sex(off_work[i].get_Sex());
                company_x[i].set_Salary(off_work[i].get_Salary());
        }
        for(int i=off_num; i<size; i++){
                company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());
                company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());
                company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());
                company_x[i].set_Sex(pro_work[i - off_num].get_Sex());
                company_x[i].set_Salary(pro_work[i - off_num].get_Salary());
        }
        for(int i=size-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(company_x[j].get_Salary() > company_x[j+1].get_Salary()){
                                Company_X tmp_company_x = company_x[j];
                                company_x[j] = company_x[j+1];
                                company_x[j+1] = tmp_company_x;
                        }
```

```cpp
        }
    }


    TextColor(7);
    cout << "\n               DANH SACH NHAN VIEN THEO TIEN LUONG\n";
    cout << "
_____
_____ \n";
    cout << "| Ma nv  |      Ho va ten      | Ngay sinh |Gioi tinh| Luong (dong) \n";
    cout << "|---------+--------------------------+--------------+---------+-------------|\n";
    for(int i=0; i<size; i++){
        cout << "|" << setw(8) << company_x[i].get_Employee_code() << " |";
        cout << setw(26) << company_x[i].get_Full_name() << " |";
        Mydate tmp_birthday = company_x[i].get_Birthday();
        cout << setw(4) << tmp_birthday << "  |";
        cout << setw(6) << company_x[i].get_Sex() << "   |";
        cout << setw(13) << company_x[i].get_Salary() << " |" << endl;
    }
    cout <<
"|_____|_____|_____|_____|_____
_____|\n";
}
// Thong ke theo van phong
void Office_statistical(Office_worker *off_work, int off_num){


    TextColor(7);
    cout << "\n               DANH SACH NHAN VIEN THEO VAN PHONG\n";
    cout << "
_____
_____ \n";
```

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```cpp
        cout << "|  Ma nv  |       Ho va ten        | Ngay sinh  |Gioi tinh|    Van phong  |\n";
        cout << "|--------+------------------------+------------+--------+----------------|\n";
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Quan ly nhan su"){
                        cout << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
                        cout << setw(26) << off_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = off_work[i].get_Birthday();
                        cout << setw(4) << tmp_birthday << "  |";
                        cout << setw(6) << off_work[i].get_Sex() << "   |";
                        cout << setw(16) << off_work[i].get_Office() << " |" << endl;
                }
        }
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Y tuong" || off_work[i].get_Office() == "Y Tuong"){
                        cout << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
                        cout << setw(26) << off_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = off_work[i].get_Birthday();
                        cout << setw(4) << tmp_birthday << "  |";
                        cout << setw(6) << off_work[i].get_Sex() << "   |";
                        cout << setw(16) << off_work[i].get_Office() << " |" << endl;
                }
        }
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Thiet ke" || off_work[i].get_Office() == "Thiet Ke"){
                        cout << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
                        cout << setw(26) << off_work[i].get_Full_name() << " |";
```

```cpp
            Mydate tmp_birthday = off_work[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << off_work[i].get_Sex() << "   |";
            cout << setw(16) << off_work[i].get_Office() << " |" << endl;

        }
    }
    for(int i=0; i<off_num; i++){
        if(off_work[i].get_Office() == "Ke toan" || off_work[i].get_Office() == "Ke
Toan"){
            cout << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
            cout << setw(26) << off_work[i].get_Full_name() << " |";
            Mydate tmp_birthday = off_work[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << off_work[i].get_Sex() << "   |";
            cout << setw(16) << off_work[i].get_Office() << " |" << endl;

        }
    }
    for(int i=0; i<off_num; i++){
        if(off_work[i].get_Office() == "Marketing"){
            cout << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
            cout << setw(26) << off_work[i].get_Full_name() << " |";
            Mydate tmp_birthday = off_work[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << off_work[i].get_Sex() << "   |";
            cout << setw(16) << off_work[i].get_Office() << " |" << endl;

        }
    }
    for(int i=0; i<off_num; i++){
```

```cpp
            if(off_work[i].get_Office() == "Ky Thuat" || off_work[i].get_Office() ==
"Ky thuat"){

                    cout << "|" << setw(8) << off_work[i].get_Employee_code() << " |";

                    cout << setw(26) << off_work[i].get_Full_name() << " |";

                    Mydate tmp_birthday = off_work[i].get_Birthday();

                    cout << setw(4) << tmp_birthday << "  |";

                    cout << setw(6) << off_work[i].get_Sex() << "   |";

                    cout << setw(16) << off_work[i].get_Office() << " |" << endl;

            }
        }


        cout <<
"|_____|_____|_____|_____|_____
_____|\n";

}
// Thong ke theo ngay vao cong ty
void Day_start_statistical(Office_worker *off_work, int off_num, Production_worker
*pro_work, int pro_num){

        int size = off_num + pro_num;

        Company_X *company_x = new Company_X[size];

        for(int i=0; i<off_num; i++){

                company_x[i].set_Employee_code(off_work[i].get_Employee_code());

                company_x[i].set_Full_name(off_work[i].get_Full_name());

                company_x[i].set_Birthday(off_work[i].get_Birthday());

                company_x[i].set_Sex(off_work[i].get_Sex());

                company_x[i].set_Day_start(off_work[i].get_Day_start());

        }

        for(int i=off_num; i<size; i++){
```

```cpp
            company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

            company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

            company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

            company_x[i].set_Sex(pro_work[i - off_num].get_Sex());

            company_x[i].set_Day_start(pro_work[i - off_num].get_Day_start());

        }
        for(int i=size-1; i>0; i--){

            for(int j=0; j<i; j++){

                if(company_x[j].get_Day_start() >
company_x[j+1].get_Day_start()){

                    Company_X tmp_company_x = company_x[j];

                    company_x[j] = company_x[j+1];

                    company_x[j+1] = tmp_company_x;

                }

            }

        }


    TextColor(7);

    cout << "\n            DANH SACH NHAN VIEN THEO NGAY VAO CONG
TY\n";

    cout << "
_____
_____ \n";

    cout << "| Ma nv |      Ho va ten      | Ngay sinh  |Gioi tinh| Ngay vao cong ty
|\n";

    cout << "|---------+--------------------------+--------------+---------+------------------
|\n";

    for(int i=0; i<size; i++){

        cout << "|" << setw(8) << company_x[i].get_Employee_code() << " |";
```
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```cpp
        cout << setw(26) << company_x[i].get_Full_name() << " |";
        Mydate tmp_birthday = company_x[i].get_Birthday();
        cout << setw(4) << tmp_birthday << "  |";
        cout << setw(6) << company_x[i].get_Sex() << "   |";
        Mydate tmp_day_start = company_x[i].get_Day_start();
        cout << setw(6) << tmp_day_start << "    |" << endl;
    }
    cout <<
"|_____|_____|_____|_____|_____
_____|\n";
}
// Thong ke theo ngay nghi
void Day_off_statistical(Production_worker *pro_work, int pro_num){

    TextColor(7);
    cout << "\n                 DANH SACH CONG NHAN THEO NGAY NGHI\n";
    cout << "
_____
__ \n";
    cout << "| Ma nv |      Ho va ten      | Ngay sinh  |Gioi tinh| Ngay nghi |\n";
    cout << "|--------+--------------------------+--------------+---------+-----------|\n";
    for(int i=0; i<pro_num; i++){
        if(pro_work[i].get_Day_off() == "Thu Hai"){
            cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
            cout << setw(26) << pro_work[i].get_Full_name() << " |";
            Mydate tmp_birthday = pro_work[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << pro_work[i].get_Sex() << "   |";
            cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;
```

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```cpp
                }
        }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Thu Ba"){
                        cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
                        cout << setw(26) << pro_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = pro_work[i].get_Birthday();
                        cout << setw(4) << tmp_birthday << "  |";
                        cout << setw(6) << pro_work[i].get_Sex() << "   |";
                        cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;
                }
        }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Thu Tu"){
                        cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
                        cout << setw(26) << pro_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = pro_work[i].get_Birthday();
                        cout << setw(4) << tmp_birthday << "  |";
                        cout << setw(6) << pro_work[i].get_Sex() << "   |";
                        cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;
                }
        }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Thu Nam"){
                        cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
                        cout << setw(26) << pro_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = pro_work[i].get_Birthday();
                        cout << setw(4) << tmp_birthday << "  |";
```

```cpp
                cout << setw(6) << pro_work[i].get_Sex() << "   |";
                cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;

        }

    }

    for(int i=0; i<pro_num; i++){
        if(pro_work[i].get_Day_off() == "Thu Sau"){
            cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
            cout << setw(26) << pro_work[i].get_Full_name() << " |";
            Mydate tmp_birthday = pro_work[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << pro_work[i].get_Sex() << "   |";
            cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;

        }

    }

    for(int i=0; i<pro_num; i++){
        if(pro_work[i].get_Day_off() == "Thu Bay"){
            cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
            cout << setw(26) << pro_work[i].get_Full_name() << " |";
            Mydate tmp_birthday = pro_work[i].get_Birthday();
            cout << setw(4) << tmp_birthday << "  |";
            cout << setw(6) << pro_work[i].get_Sex() << "   |";
            cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;

        }

    }

    for(int i=0; i<pro_num; i++){
        if(pro_work[i].get_Day_off() == "Chu Nhat"){
            cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
            cout << setw(26) << pro_work[i].get_Full_name() << " |";
```

```cpp
                    Mydate tmp_birthday = pro_work[i].get_Birthday();
                    cout << setw(4) << tmp_birthday << "  |";
                    cout << setw(6) << pro_work[i].get_Sex() << "   |";
                    cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;
            }
        }
        cout <<
"|_____|_____|_____|_____|_____
_|\n";
}
// Thong ke theo ngay nghi cong nhan nu
void Day_off_female_statistical(Production_worker *pro_work, int pro_num){

        TextColor(7);
        cout << "\n                DANH SACH NGAY NGHI CONG NHAN NU\n";
        cout << "
_____
__ \n";
        cout << "| Ma nv |      Ho va ten        | Ngay sinh  |Gioi tinh| Ngay nghi |\n";
        cout << "|--------+--------------------------+--------------+---------+-----------|\n";
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Sex() == "Nu"){
                    cout << "|" << setw(8) << pro_work[i].get_Employee_code() << " |";
                    cout << setw(26) << pro_work[i].get_Full_name() << " |";
                    Mydate tmp_birthday = pro_work[i].get_Birthday();
                    cout << setw(4) << tmp_birthday << "  |";
                    cout << setw(6) << pro_work[i].get_Sex() << "   |";
                    cout << setw(10) << pro_work[i].get_Day_off() << " |" << endl;
                }
```

```
        }
        cout <<
"|_____|_____|_____|_____|_____
_|\n";
}



// Xuat danh sach nhan vien vao file

void List_office_file_output(Office_worker* &off_work, int off_num){
        // Sap xep danh sach
        for(int i=off_num-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(off_work[j] > off_work[j+1]){
                                Office_worker tmp_office_worker = off_work[j];
                                off_work[j] = off_work[j+1];
                                off_work[j+1] = tmp_office_worker;
                        }
                }
        }

        file_list << "\n                              DANH SACH NHAN VIEN VAN
PHONG\n";
        file_list << "Tong so " << off_num << " nhan vien." << endl;
        file_list << "

_____

_____
_____ \n";
        file_list << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh|        Que
quan         | Ngay vao cong ty | Luong (dong) |    Van phong  \n";
```

```cpp
        file_list << "|---------+-------------------------+-------------+---------+-------------------------------------+-----------------+-------------+----------------|\n";

        for(int i=0; i<off_num; i++){
                file_list << off_work[i];
        }
        file_list <<
"|_____|_____|_____|_____|_____|_____|_____|_____|\n";
}
// Xuat danh sach cong nhan vao file
void List_production_file_output(Production_worker* &pro_work, int pro_num){
        // Sap xep danh sach
        for(int i=pro_num-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(pro_work[j] > pro_work[j+1]){
                                Production_worker tmp_production_worker = pro_work[j];
                                pro_work[j] = pro_work[j+1];
                                pro_work[j+1] = tmp_production_worker;
                        }
                }
        }

        file_list << "\n                          DANH SACH CONG NHAN SAN XUAT\n";
        file_list << "Tong so " << pro_num << " cong nhan." << endl;
        file_list << "
_____
_____
_____ \n";
```

```
            file_list << "|  Ma nv  |        Ho va ten        | Ngay sinh  |Gioi tinh|            Que
quan            | Ngay vao cong ty | Luong (dong) | Dinh muc sp (sp/thang) | Ngay nghi |\n";
            file_list << "|---------+-------------------------+--------------+---------+------------------
-------------------+-----------------+-------------+-----------------------+----------|\n";
            for(int i=0; i<pro_num; i++){
                    file_list << pro_work[i];
            }
            file_list <<
"|_____|_____|_____|_____|_____
_____|_____|_____|_____
_____|_____|\n";
}
// Xuat danh sach nhan vien chuyen khoi cong ty vao file
void List_move_file_output(Move_worker* &mov_work, int mov_num){
        // Sap xep danh sach
        for(int i=mov_num-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(mov_work[j] > mov_work[j+1]){
                                Move_worker tmp_move_worker = mov_work[j];
                                mov_work[j] = mov_work[j+1];
                                mov_work[j+1] = tmp_move_worker;
                        }
                }
        }

        file_list << "\n                    DANH SACH NHAN VIEN CHUYEN DI\n";
        file_list << "Tong so " << mov_num << " nhan vien." << endl;
        file_list << "
_____
_____ \n";
```

```cpp
        file_list << "|  Ma nv  |       Ho va ten        | Ngay sinh  |Gioi tinh| Ngay chuyen di  |\n";

        file_list << "|---------+-------------------------+-------------+---------+-----------------|\n";

    for(int i=0; i<mov_num; i++){

            file_list << mov_work[i];

    }

        file_list << "|_____|_____|_____|_____|_____|\n";

}



// Xuat bang thong ke nhan vien trong cong ty vao file

void Employee_statistical_file_output(Office_worker *off_work, int off_num, Production_worker *pro_work, int pro_num){

    int size = off_num + pro_num;

    Company_X *company_x = new Company_X[size];

    for(int i=0; i<off_num; i++){

            company_x[i].set_Employee_code(off_work[i].get_Employee_code());

            company_x[i].set_Full_name(off_work[i].get_Full_name());

            company_x[i].set_Birthday(off_work[i].get_Birthday());

            company_x[i].set_Sex(off_work[i].get_Sex());

            company_x[i].set_Native_place(off_work[i].get_Native_place());

            company_x[i].set_Day_start(off_work[i].get_Day_start());

            company_x[i].set_Salary(off_work[i].get_Salary());


    }

    for(int i=off_num; i<size; i++){
```

```cpp
            company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

            company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

            company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

            company_x[i].set_Sex(pro_work[i - off_num].get_Sex());

            company_x[i].set_Native_place(pro_work[i -
off_num].get_Native_place());

            company_x[i].set_Day_start(pro_work[i - off_num].get_Day_start());

            company_x[i].set_Salary(pro_work[i - off_num].get_Salary());

        }


        // Sap xep danh sach theo ten Alphabet
        for(int i=size-1; i>0; i--){

            for(int j=0; j<i; j++){

                if(company_x[j] > company_x[j+1]){

                    Company_X tmp_company_x = company_x[j];

                    company_x[j] = company_x[j+1];

                    company_x[j+1] = tmp_company_x;

                }

            }

        }
        file_statistical << "\n                                DANH SACH NHAN VIEN
CONG TY\n";

        file_statistical << "Tong so: " << Company_X::Total_employee << " nhan vien"
<< endl;

        file_statistical << "
_____
_____ \n";

        file_statistical << "| Ma nv |       Ho va ten       | Ngay sinh  |Gioi tinh|
Que quan          | Ngay vao cong ty | Luong (dong) |\n";
```

```cpp
        file_statistical << "|---------+------------------------+-------------+---------+----------
----------------------------+-----------------+-------------|\n";
        for(int i=0; i<size; i++){
                file_statistical << "|" << setw(8) << company_x[i].get_Employee_code() <<
" |";
                file_statistical << setw(26) << company_x[i].get_Full_name() << " |";
                Mydate tmp_birthday = company_x[i].get_Birthday();
                file_statistical << setw(4) << tmp_birthday << " |";
                file_statistical << setw(6) << company_x[i].get_Sex() << "   |";
                file_statistical << setw(37) << company_x[i].get_Native_place() << " |";
                Mydate tmp_day_start = company_x[i].get_Day_start();
                file_statistical << setw(6) << tmp_day_start << "    |";
                file_statistical << setw(13) << company_x[i].get_Salary() << " |" << endl;
        }
        file_statistical <<
"|_____|_____|_____|_____|_____
_____|_____|_____|\n";
}
// Xuat bang thong ke theo gioi tinh vao file
void Sex_statistical_file_output(Office_worker *off_work, int off_num,
Production_worker *pro_work, int pro_num){
        int size = off_num + pro_num;
        Company_X *company_x = new Company_X[size];
        for(int i=0; i<off_num; i++){
                company_x[i].set_Employee_code(off_work[i].get_Employee_code());
                company_x[i].set_Full_name(off_work[i].get_Full_name());
                company_x[i].set_Birthday(off_work[i].get_Birthday());
                company_x[i].set_Sex(off_work[i].get_Sex());
        }
```

```cpp
        for(int i=off_num; i<size; i++){
                company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());
                company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());
                company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());
                company_x[i].set_Sex(pro_work[i - off_num].get_Sex());
        }


        // Sap xep theo nam sinh
        for(int i=size-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(company_x[j].get_Birthday() > company_x[j+1].get_Birthday()){
                                Company_X tmp_company_x = company_x[j];
                                company_x[j] = company_x[j+1];
                                company_x[j+1] = tmp_company_x;
                        }
                }
        }


        int Total_male = 0;
        for(int i=0; i<size; i++){
                if(company_x[i].get_Sex() == "Nam"){
                        Total_male++;
                }
        }


        file_statistical << "\n            DANH SACH NHAN VIEN NAM\n";
        file_statistical << "Tong so: " << Total_male << " nam" << endl;
```

```cpp
file_statistical << "
_____ \n";
file_statistical << "|  Ma nv  |      Ho va ten       | Ngay sinh  |Gioi tinh|\n";
file_statistical << "|---------+-------------------------+-------------+---------|\n";
for(int i=0; i<size; i++){
        if(company_x[i].get_Sex() == "Nam"){
                file_statistical << "|" << setw(8) <<
company_x[i].get_Employee_code() << " |";
                file_statistical << setw(26) << company_x[i].get_Full_name() << "
|";
                Mydate tmp_birthday = company_x[i].get_Birthday();
                file_statistical << setw(4) << tmp_birthday << "  |";
                file_statistical << setw(6) << company_x[i].get_Sex() << "   |" <<
endl;
        }
}


file_statistical <<
"|_____|_____|_____|_____|\n";


file_statistical << "\n            DANH SACH NHAN VIEN NU\n";
file_statistical << "Tong so: " << size - Total_male << " nu" << endl;
file_statistical << "
_____ \n";
file_statistical << "|  Ma nv  |      Ho va ten       | Ngay sinh  |Gioi tinh|\n";
file_statistical << "|---------+-------------------------+-------------+---------|\n";
for(int i=0; i<size; i++){
        if(company_x[i].get_Sex() == "Nu"){
                file_statistical << "|" << setw(8) <<
company_x[i].get_Employee_code() << " |";
```

```cpp
            file_statistical << setw(26) << company_x[i].get_Full_name() << "
|";

                Mydate tmp_birthday = company_x[i].get_Birthday();

                file_statistical << setw(4) << tmp_birthday << " |";

                file_statistical << setw(6) << company_x[i].get_Sex() << "   |" <<
endl;

            }
        }
        file_statistical <<
"|_____|_____|_____|_____|\n";
}
// Xuat bang thong ke theo nam sinh vao file
void Birthday_statistical_file_output(Office_worker *off_work, int off_num,
Production_worker *pro_work, int pro_num){
        int size = off_num + pro_num;
        Company_X *company_x = new Company_X[size];
        for(int i=0; i<off_num; i++){
                company_x[i].set_Employee_code(off_work[i].get_Employee_code());
                company_x[i].set_Full_name(off_work[i].get_Full_name());
                company_x[i].set_Birthday(off_work[i].get_Birthday());
                company_x[i].set_Sex(off_work[i].get_Sex());
        }
        for(int i=off_num; i<size; i++){
                company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());
                company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());
                company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());
                company_x[i].set_Sex(pro_work[i - off_num].get_Sex());
        }
```

```cpp
        // Sap xep theo nam sinh
        for(int i=size-1; i>0; i--){
                for(int j=0; j<i; j++){
                        if(company_x[j].get_Birthday() > company_x[j+1].get_Birthday()){
                                Company_X tmp_company_x = company_x[j];
                                company_x[j] = company_x[j+1];
                                company_x[j+1] = tmp_company_x;
                        }
                }
        }


        file_statistical << "\n        DANH SACH NHAN VIEN XEP THEO NGAY SINH\n";
        file_statistical << "_____ \n";
        file_statistical << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh|\n";
        file_statistical << "|---------+--------------------------+--------------+---------|\n";
        for(int i=0; i<size; i++){
                file_statistical << "|" << setw(8) << company_x[i].get_Employee_code() << " |";
                file_statistical << setw(26) << company_x[i].get_Full_name() << " |";
                Mydate tmp_birthday = company_x[i].get_Birthday();
                file_statistical << setw(4) << tmp_birthday << "  |";
                file_statistical << setw(6) << company_x[i].get_Sex() << "   |" << endl;
        }
        file_statistical << "|_____|_____|_____|_____|\n";
}
```

```cpp
// Xuat bang thong ke theo tien luong vao file

void Salary_statistical_file_output(Office_worker *off_work, int off_num,
Production_worker *pro_work, int pro_num){

    int size = off_num + pro_num;

    Company_X *company_x = new Company_X[size];

    for(int i=0; i<off_num; i++){

        company_x[i].set_Employee_code(off_work[i].get_Employee_code());

        company_x[i].set_Full_name(off_work[i].get_Full_name());

        company_x[i].set_Birthday(off_work[i].get_Birthday());

        company_x[i].set_Sex(off_work[i].get_Sex());

        company_x[i].set_Salary(off_work[i].get_Salary());

    }

    for(int i=off_num; i<size; i++){

        company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

        company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

        company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

        company_x[i].set_Sex(pro_work[i - off_num].get_Sex());

        company_x[i].set_Salary(pro_work[i - off_num].get_Salary());

    }

    for(int i=size-1; i>0; i--){

        for(int j=0; j<i; j++){

            if(company_x[j].get_Salary() > company_x[j+1].get_Salary()){

                Company_X tmp_company_x = company_x[j];

                company_x[j] = company_x[j+1];

                company_x[j+1] = tmp_company_x;

            }

        }
```

```cpp
	}
	file_statistical << "\n                DANH SACH NHAN VIEN THEO TIEN LUONG\n";
	file_statistical << "
_____
_____ \n";
	file_statistical << "| Ma nv |      Ho va ten       | Ngay sinh  |Gioi tinh| Luong (dong) |\n";
	file_statistical << "|---------+--------------------------+--------------+---------+--------------|\n";
	for(int i=0; i<size; i++){
		file_statistical << "|" << setw(8) << company_x[i].get_Employee_code() << " |";
		file_statistical << setw(26) << company_x[i].get_Full_name() << " |";
		Mydate tmp_birthday = company_x[i].get_Birthday();
		file_statistical << setw(4) << tmp_birthday << "  |";
		file_statistical << setw(6) << company_x[i].get_Sex() << "   |";
		file_statistical << setw(13) << company_x[i].get_Salary() << " |" << endl;
	}
	file_statistical << "|_____|_____|_____|_____|_____
_____|\n";
}
// Xuat bang thong ke theo van phong vao file
void Office_statistical_file_output(Office_worker *off_work, int off_num){

	file_statistical << "\n                DANH SACH NHAN VIEN THEO VAN PHONG\n";
	file_statistical << "
_____
_____ \n";
```

```cpp
        file_statistical << "|  Ma nv  |       Ho va ten        | Ngay sinh  |Gioi tinh|    Van phong   \n";
        file_statistical << "|---------+--------------------------+--------------+---------+-----------------|\n";
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Quan ly nhan su"){
                        file_statistical << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << off_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = off_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << off_work[i].get_Sex() << "   |";
                        file_statistical << setw(16) << off_work[i].get_Office() << " |" << endl;
                }
        }
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Y tuong" || off_work[i].get_Office() == "Y Tuong"){
                        file_statistical << "|" << setw(8) << off_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << off_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = off_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << off_work[i].get_Sex() << "   |";
                        file_statistical << setw(16) << off_work[i].get_Office() << " |" << endl;
                }
        }
        for(int i=0; i<off_num; i++){
```

```cpp
            if(off_work[i].get_Office() == "Thiet ke" || off_work[i].get_Office() ==
"Thiet Ke"){
                        file_statistical << "|" << setw(8) <<
off_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << off_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = off_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << off_work[i].get_Sex() << "   |";
                        file_statistical << setw(16) << off_work[i].get_Office() << " |" <<
endl;
                }
        }
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Ke toan" || off_work[i].get_Office() == "Ke
Toan"){
                        file_statistical << "|" << setw(8) <<
off_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << off_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = off_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << off_work[i].get_Sex() << "   |";
                        file_statistical << setw(16) << off_work[i].get_Office() << " |" <<
endl;
                }
        }
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Marketing"){
                        file_statistical << "|" << setw(8) <<
off_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << off_work[i].get_Full_name() << " |";
```

```cpp
                        Mydate tmp_birthday = off_work[i].get_Birthday();

                        file_statistical << setw(4) << tmp_birthday << "  |";

                        file_statistical << setw(6) << off_work[i].get_Sex() << "   |";

                        file_statistical << setw(16) << off_work[i].get_Office() << " |" << endl;

                }
        }
        for(int i=0; i<off_num; i++){
                if(off_work[i].get_Office() == "Ky Thuat" || off_work[i].get_Office() == "Ky thuat"){
                        file_statistical << "|" << setw(8) << off_work[i].get_Employee_code() << " |";

                        file_statistical << setw(26) << off_work[i].get_Full_name() << " |";

                        Mydate tmp_birthday = off_work[i].get_Birthday();

                        file_statistical << setw(4) << tmp_birthday << "  |";

                        file_statistical << setw(6) << off_work[i].get_Sex() << "   |";

                        file_statistical << setw(16) << off_work[i].get_Office() << " |" << endl;

                }
        }
        file_statistical << "|_____|_____|_____|_____|_____|\n";
}
// Xuat bang thong ke theo ngay vao cong ty vao file
void Day_start_statistical_file_output(Office_worker *off_work, int off_num, Production_worker *pro_work, int pro_num){
        int size = off_num + pro_num;

        Company_X *company_x = new Company_X[size];

        for(int i=0; i<off_num; i++){
```
75

```
        company_x[i].set_Employee_code(off_work[i].get_Employee_code());

        company_x[i].set_Full_name(off_work[i].get_Full_name());

        company_x[i].set_Birthday(off_work[i].get_Birthday());

        company_x[i].set_Sex(off_work[i].get_Sex());

        company_x[i].set_Day_start(off_work[i].get_Day_start());

    }

    for(int i=off_num; i<size; i++){

        company_x[i].set_Employee_code(pro_work[i -
off_num].get_Employee_code());

        company_x[i].set_Full_name(pro_work[i - off_num].get_Full_name());

        company_x[i].set_Birthday(pro_work[i - off_num].get_Birthday());

        company_x[i].set_Sex(pro_work[i - off_num].get_Sex());

        company_x[i].set_Day_start(pro_work[i - off_num].get_Day_start());

    }

    for(int i=size-1; i>0; i--){

        for(int j=0; j<i; j++){

            if(company_x[j].get_Day_start() >
company_x[j+1].get_Day_start()){

                Company_X tmp_company_x = company_x[j];

                company_x[j] = company_x[j+1];

                company_x[j+1] = tmp_company_x;

            }

        }

    }

    file_statistical << "\n              DANH SACH NHAN VIEN THEO NGAY VAO
CONG TY\n";

    file_statistical << "

_____
_____ \n";
```

```cpp
        file_statistical << "|  Ma nv  |       Ho va ten       | Ngay sinh  |Gioi tinh| Ngay
vao cong ty |\n";
        file_statistical << "|---------+-------------------------+-------------+---------+----------
--------|\n";
        for(int i=0; i<size; i++){
                file_statistical << "|" << setw(8) << company_x[i].get_Employee_code() <<
" |";

                file_statistical << setw(26) << company_x[i].get_Full_name() << " |";

                Mydate tmp_birthday = company_x[i].get_Birthday();

                file_statistical << setw(4) << tmp_birthday << "  |";

                file_statistical << setw(6) << company_x[i].get_Sex() << "   |";

                Mydate tmp_day_start = company_x[i].get_Day_start();

                file_statistical << setw(6) << tmp_day_start << "    |" << endl;

        }
        file_statistical <<
"|_____|_____|_____|_____|_____
_____|\n";
}
// Xuat bang thong ke theo ngay nghi vao file

void Day_off_statistical_file_output(Production_worker *pro_work, int pro_num){


        file_statistical << "\n                DANH SACH CONG NHAN THEO NGAY
NGHI\n";
        file_statistical << "
_____
__ \n";
        file_statistical << "|  Ma nv  |       Ho va ten       | Ngay sinh  |Gioi tinh| Ngay
nghi |\n";
        file_statistical << "|---------+-------------------------+-------------+---------+----------
-|\n";
        for(int i=0; i<pro_num; i++){
```

```cpp
                if(pro_work[i].get_Day_off() == "Thu Hai"){
                    file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";
                    file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";
                    Mydate tmp_birthday = pro_work[i].get_Birthday();
                    file_statistical << setw(4) << tmp_birthday << "  |";
                    file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";
                    file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;
                }
        }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Thu Ba"){
                    file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";
                    file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";
                    Mydate tmp_birthday = pro_work[i].get_Birthday();
                    file_statistical << setw(4) << tmp_birthday << "  |";
                    file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";
                    file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;
                }
        }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Thu Tu"){
                    file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";
                    file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";
                    Mydate tmp_birthday = pro_work[i].get_Birthday();
```

```cpp
                file_statistical << setw(4) << tmp_birthday << "  |";

                file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";

                file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;

            }

        }

        for(int i=0; i<pro_num; i++){

            if(pro_work[i].get_Day_off() == "Thu Nam"){

                file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";

                file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";

                Mydate tmp_birthday = pro_work[i].get_Birthday();

                file_statistical << setw(4) << tmp_birthday << "  |";

                file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";

                file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;

            }

        }

        for(int i=0; i<pro_num; i++){

            if(pro_work[i].get_Day_off() == "Thu Sau"){

                file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";

                file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";

                Mydate tmp_birthday = pro_work[i].get_Birthday();

                file_statistical << setw(4) << tmp_birthday << "  |";

                file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";

                file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;

            }
```

```cpp
            }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Thu Bay"){
                        file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = pro_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";
                        file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;
                }
        }
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Day_off() == "Chu Nhat"){
                        file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = pro_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";
                        file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;
                }
        }
        file_statistical <<
"|_____|_____|_____|_____|_____
_|\n";
}
// Xuat bang thong ke theo ngay nghi cong nhan nu vao file
```

```cpp
void Day_off_female_statistical_file_output(Production_worker *pro_work, int
pro_num){
        file_statistical << "\n            DANH SACH NGAY NGHI CONG NHAN
NU\n";
        file_statistical << "
_____
__ \n";
        file_statistical << "| Ma nv |      Ho va ten        | Ngay sinh  |Gioi tinh| Ngay
nghi |\n";
        file_statistical << "|---------+-------------------------+-------------+---------+----------
-|\n";
        for(int i=0; i<pro_num; i++){
                if(pro_work[i].get_Sex() == "Nu"){
                        file_statistical << "|" << setw(8) <<
pro_work[i].get_Employee_code() << " |";
                        file_statistical << setw(26) << pro_work[i].get_Full_name() << " |";
                        Mydate tmp_birthday = pro_work[i].get_Birthday();
                        file_statistical << setw(4) << tmp_birthday << "  |";
                        file_statistical << setw(6) << pro_work[i].get_Sex() << "   |";
                        file_statistical << setw(10) << pro_work[i].get_Day_off() << " |" <<
endl;
                }
        }
        file_statistical <<
"|_____|_____|_____|_____|_____
_|\n";
}
// Xuat bang thong ke nhan vien chuyen di khoi cong ty
void List_move_statistical_file_output(Move_worker *mov_work, int size){
        file_statistical << "\n                DANH SACH NHAN VIEN CHUYEN
DI\n";
```

```cpp
        file_statistical << "
_____
_____ \n";
        file_statistical << "|  Ma nv  |       Ho va ten        | Ngay sinh  |Gioi tinh|  Ngay
chuyen di  |\n";
        file_statistical << "|---------+--------------------------+-------------+---------+----------
--------|\n";
        for(int i=0; i<size; i++){
                file_statistical << mov_work[i];
        }
        file_statistical <<
"|_____|_____|_____|_____|_____
_____|\n";
}


int main(){

        int mark_office_code;
        int off_num;

        file_office >> mark_office_code;
        file_office >> off_num;
        file_office.ignore();
        Office_worker *off_work = new Office_worker[off_num];
        for(int i=0; i<off_num; i++){
                file_office >> off_work[i];
        }

        int mark_production_code;
```

```cpp
    int pro_num;

    file_production >> mark_production_code;
    file_production >> pro_num;
    file_production.ignore();
    Production_worker *pro_work = new Production_worker[pro_num];
    for(int i=0; i<pro_num; i++){
        file_production >> pro_work[i];
    }

    int mov_num;

    file_move >> mov_num;
    file_move.ignore();
    Move_worker *mov_work = new Move_worker[mov_num];
    for(int i=0; i<mov_num; i++){
        file_move >> mov_work[i];
    }

    MENU();

    while(true){

        TextColor(14);
        cout << "Nhap lua chon cua ban: ";
        string select;
        getline(cin, select);
```

```cpp
if(select == "0"){
        break;
}
else if(select == "1"){
        int check1, check2, check3;
        do {
                string worker_code;
                cout << "Nhap ma nhan vien tim: ";
                getline(cin, worker_code);
                Find(off_work, off_num, worker_code, check1);
                Find(pro_work, pro_num, worker_code, check2);
                Find(mov_work, mov_num, worker_code, check3);
                if(!check1 && !check2 && !check3){
                        cout << "Ma ban nhap khong dung.\n";
                        cout << "Chon 0 de thoat / so bat ky de tiep tuc: ";
                        string select1;
                        getline(cin, select1);
                        if(select1 == "0") {
                                break;
                        }
                        else {
                                cout << "Vui long nhap lai!\n";
                        }
                }
        } while(!check1 && !check2 && !check3);
}
else if(select == "2"){
        MENU_company();
```

```cpp
                    string select1;
                    do {
                            cout << "\tLua chon 1 / 2 / 3: ";
                            getline(cin, select1);
                            if(select1 == "1"){
                                    List_office(off_work, off_num);
                            }
                            else if(select1 == "2"){
                                    List_production(pro_work, pro_num);
                            }
                            else if(select1 == "3"){
                                    List_move(mov_work, mov_num);
                            }
                            else{
                                    cout << "Lua chon khong dung. Vui long nhap lai!\n";
                            }
                    } while (select1 != "1" && select1 != "2" && select1 != "3");
            }
            else if(select == "3"){
                    cout << "\n\t1. Nhan vien van phong.\n";
                    cout << "\t2. Cong nhan san xuat.\n";
                    string select1;
                    cout << "\nLua chon them nhan vien 1 / 2: ";
                    getline(cin, select1);
                    if(select1 == "1"){
                            Add_employee_office(off_work, off_num,
mark_office_code);
                    }
```

```cpp
                    else if(select1 == "2"){
                        Add_employee_production(pro_work, pro_num,
mark_production_code);
                    }
                    else {
                        cout << "Lua chon khong phu hop.\n";
                    }
                }
            else if(select == "4"){
                cout << "\n\t1. Nhan vien van phong.\n";
                cout << "\t2. Cong nhan san xuat.\n";
                string select1;
                cout << "\nLua chon xoa nhan vien 1 / 2: ";
                getline(cin, select1);
                if(select1 == "1"){
                    Move_worker move_worker;
                    move_worker.set_Employee_code("");
                    Delete_employee_office(off_work, off_num, move_worker);
                    Add_employee_move(mov_work, mov_num, move_worker);
                }
                else if(select1 == "2"){
                    Move_worker move_worker;
                    move_worker.set_Employee_code("");
                    Delete_employee_production(pro_work, pro_num,
move_worker);
                    Add_employee_move(mov_work, mov_num, move_worker);
                }
                else {
```

```cpp
                    cout << "Lua chon khong phu hop.\n";
                }
            }
            else if(select == "5"){
                cout << "\n\t1. Nhan vien van phong.\n";
                cout << "\t2. Cong nhan san xuat.\n";
                string select1;
                cout << "\nLua chon chinh sua nhan vien 1 / 2: ";
                getline(cin, select1);
                if(select1 == "1"){
                    Edit_employee_office(off_work, off_num);
                }
                else if(select1 == "2"){
                    Edit_employee_production(pro_work, pro_num);
                }
                else {
                    cout << "Lua chon khong phu hop.\n";
                }
            }
            else if(select == "6"){
                MENU_statistical();
                cout << "\nLua chon 0 / 1 / 2  / 3 / 4 / 5 / 6 / 7 / 8: ";
                string select1;
                getline(cin, select1);
                if(select1 == "0"){
                    Employee_statistical(off_work, off_num, pro_work,
pro_num);
                }
```

```cpp
        else if(select1 == "1"){
                Sex_statistical(off_work, off_num, pro_work, pro_num);
        }
        else if(select1 == "2"){
                Birthday_statistical(off_work, off_num, pro_work, pro_num);
        }
        else if(select1 == "3"){
                Salary_statistical(off_work, off_num, pro_work, pro_num);
        }
        else if(select1 == "4"){
                Office_statistical(off_work, off_num);
        }
        else if(select1 == "5"){
                Day_start_statistical(off_work, off_num, pro_work,
pro_num);

        }
        else if(select1 == "6"){
                Day_off_statistical(pro_work, pro_num);
        }
        else if(select1 == "7"){
                Day_off_female_statistical(pro_work, pro_num);
        }
        else if(select1 == "8"){
                List_move(mov_work, mov_num);
        }
        else{
                cout << "Lua chon khong phu hop.\n";
        }
```

```
        }
        else {
                cout << "Lua chon khong dung. Vui long nhap lai!\n";
        }
        system("pause");
        system("cls");
        MENU();
}


// Xuat danh sach vao file
List_office_file_output(off_work, off_num);
file_list << endl;
List_production_file_output(pro_work, pro_num);
file_list << endl;
List_move_file_output(mov_work, mov_num);


// Xuat du lieu thong ke vao file
Employee_statistical_file_output(off_work, off_num, pro_work, pro_num);
file_statistical << endl;
Sex_statistical_file_output(off_work, off_num, pro_work, pro_num);
file_statistical << endl;
Birthday_statistical_file_output(off_work, off_num, pro_work, pro_num);
file_statistical << endl;
Salary_statistical_file_output(off_work, off_num, pro_work, pro_num);
file_statistical << endl;
Office_statistical_file_output(off_work, off_num);
file_statistical << endl;
Day_start_statistical_file_output(off_work, off_num, pro_work, pro_num);
```

```cpp
        file_statistical << endl;
        Day_off_statistical_file_output(pro_work, pro_num);
        file_statistical << endl;
        Day_off_female_statistical_file_output(pro_work, pro_num);
        file_statistical << endl;
        List_move_statistical_file_output(mov_work, mov_num);
        file_statistical << endl;

        Change_file(mov_work, mov_num);
        Change_file(off_work, off_num, mark_office_code);
        Change_file(pro_work, pro_num, mark_production_code);

        file_office.close();
        file_production.close();
        file_move.close();
        file_list.close();
        file_statistical.close();

        return 0;
}
```

6. Dữ liệu vào/ ra

6.1. Tệp dữ liệu vào

- Tệp: Ofice_worker_input.txt

```
OFF004
Nguyen Van Anh
25 10 2000
Nam
TT Song Thao-Cam Khe-Phu Tho
14 2 2020
10000000
Thiet Ke
```

- Tệp: Production_worker_input.txt

```
PRO001
Nguyen Van An
22 9 1971
Nam
Hung Yen - Hung Nguyen - Nghe An
1 1 2017
12000000
2400
Chu Nhat
```

- Tệp: Move_worker_input.txt

```
OFF021
Truong Van An
12 12 1994
Nam
14 6 2023
```

6.2. Tệp dữ liệu ra

- Tệp: File_list_worker

```
                              DANH SACH NHAN VIEN VAN PHONG
Tong so 20 nhan vien.

| Ma nv  |      Ho va ten      | Ngay sinh |Gioi tinh|           Que quan            | Ngay vao cong ty | Luong (dong) |   Van phong    |
|--------+---------------------+-----------+---------+-------------------------------+------------------+--------------+----------------|
| OFF004 |   Nguyen Van Anh     | 25/10/2000 |   Nam   |   TT Song Thao-Cam Khe-Phu Tho  |   14/ 2/2020   |   10000000   |    Thiet Ke    |
| OFF025 | Nguyen Thi Van Anh   |  6/11/2000 |   Nu    |    Yen Xa - Y Yen - Nam Dinh    |   13/ 6/2022   |   11000000   |    Thiet Ke    |
| OFF014 |   Tran Trong Dat     |  3/10/1999 |   Nam   |    Phu Phuc - Ly Nhan - Ha Nam  |    4/ 9/2018   |   13000000   |    Y Tuong     |
| OFF011 |   Mai Tien Dung      | 20/11/2000 |   Nam   |   Nga Thanh - Nga Son - Thanh Hoa |   24/ 2/2022   |   11000000   |    Ky Thuat    |
| OFF019 |   Bui Van Dung       | 22/ 4/2001 |   Nam   |   An Hoa - Tam Duong - Vinh Phuc  |   12/ 3/2023   |    9000000   |    Y Tuong     |
| OFF010 |  Nguyen Hong Ha      | 10/ 9/1987 |   Nu    | Khu 4-Thach Son - Lam Thao-Phu Tho |  10/ 4/2019   |   13000000   | Quan ly nhan su |
```

- Tệp: File_output_statiscal

```
                              DANH SACH NHAN VIEN CONG TY
Tong so: 40 nhan vien

| Ma nv  |      Ho va ten      | Ngay sinh |Gioi tinh|           Que quan            | Ngay vao cong ty | Luong (dong) |
|--------+---------------------+-----------+---------+-------------------------------+------------------+--------------|
| PRO001 |   Nguyen Van An      | 22/ 9/1971 |   Nam   |  Hung Yen - Hung Nguyen - Nghe An |    1/ 1/2017   |   12000000   |
| OFF004 |   Nguyen Van Anh     | 25/10/2000 |   Nam   |   TT Song Thao-Cam Khe-Phu Tho  |   14/ 2/2020   |   10000000   |
| OFF025 | Nguyen Thi Van Anh   |  6/11/2000 |   Nu    |    Yen Xa - Y Yen - Nam Dinh    |   13/ 6/2022   |   11000000   |
| PRO002 |   Tran Van Anh       | 15/12/1988 |   Nam   | Hoang Khai - Yen Son - Tuyen Quang |   3/ 2/2016   |   11000000   |
| PRO011 |  Nguyen Thi Ha Anh   |  1/10/2002 |   Nu    | Cam Thanh - Cam Pha - Quang Ninh  |   5/ 3/2022   |   10500000   |
| PRO003 |   Huynh Thi Binh     | 22/ 9/1980 |   Nu    |  Dien Yen - Dien Chau - Nghe An   |   3/ 2/2017   |   10000000   |
| PRO004 |    Vo Van Chien      | 20/ 4/1978 |   Nam   |  Luong Tai - Ban Lam - Hung Yen   |   6/ 5/2014   |   11000000   |
| OFF014 |   Tran Trong Dat     |  3/10/1999 |   Nam   |    Phu Phuc - Ly Nhan - Ha Nam  |    4/ 9/2018   |   13000000   |
| OFF011 |   Mai Tien Dung      | 20/11/2000 |   Nam   |  Nga Thanh - Nga Son - Thanh Hoa  |   24/ 2/2022   |   11000000   |
```

PHẦN II: PHÂN CÔNG CÔNG VIỆC TRONG NHÓM

STT	Họ và tên	Công việc được giao	Ghi chú
1	Nguyễn Đình Mạnh	Code chính, làm file xuất/ nhập	
2	Võ Tạ Đức	Code phụ, làm báo cáo	
3	Vũ Hoàng Hải	Làm powpoin, tìm dữ liệu nhập	

PHẦN III: ĐÁNH GIÁ NHÓM

STT	Họ và tên	Đánh giá hoạt động nhóm	Xếp loại
1	Nguyễn Đình Mạnh	Tốt	A
2	Võ Tạ Đức	Tốt	A
3	Vũ Hoàng Hải	Khá	B

Ghi chú: Mỗi người xếp 1 trong 4 loại (Loại A chỉ được 1 - 2 bạn)

A: Tốt

B: Khá

C: Trung bình

D: Không tham gia nhóm