

Zagazig University
Faculty of Computers and Informatics
Second grade

OOP Coursework Project

Student name	Hassan Ramadan Ibrahim Abdellatif
Seat number	2123
Email	HassanRamadanEbrahim@gmail.com
Grade	second
Lecturer	Dr. Ahmed Rafat
Tobic	C++ project that uses the object-oriented programming principles to follow up the heat temperature for multiple persons for 14 days in the Quarantine (number 1).

Heat Temperature Follow in the Quarantine System

Abstract

This system is used to follow up the heat temperature for multiple persons for 14 days in the Quarantine. It is implemented by applying object oriented programming principles using C++. Object oriented programming is a very powerful and popular programming paradigm.

Using the system you can Insert a person and add whose information such as age, residence - the place he/she lives in - and the temperature during 14 days to follow up the person's heat temperature. And it automatically calculates the average of the person's heat temperature.

The system guarantees you also display a person's information and temperature through the Quarantine. Also you can edit this person's information.

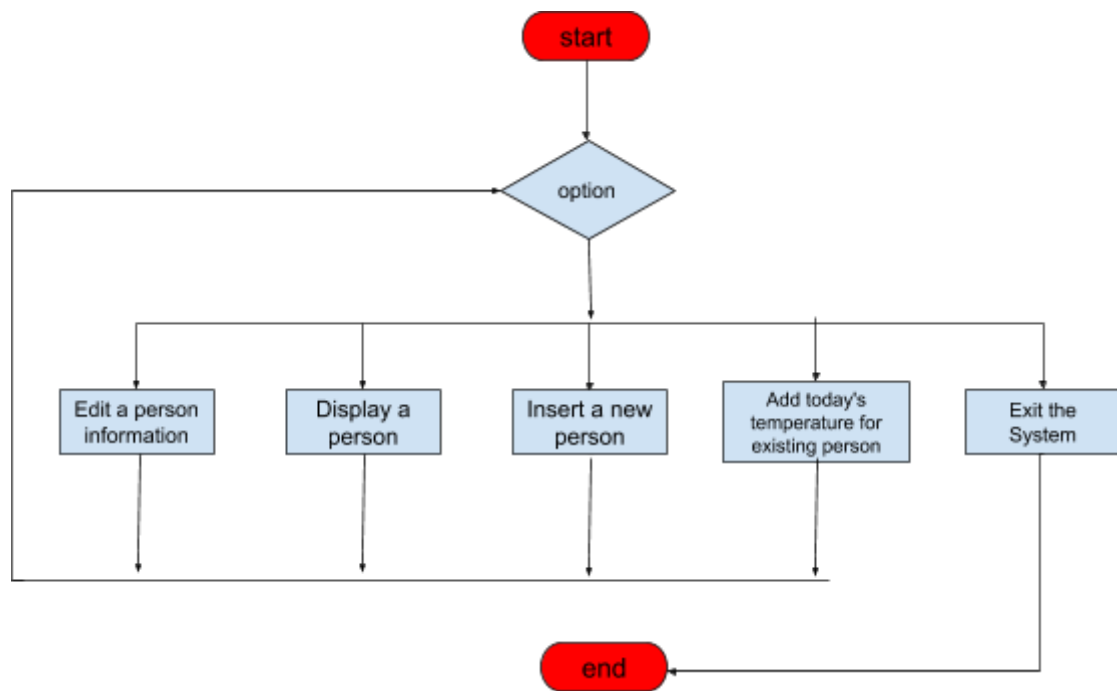
Introduction

The main advantages of OOP paradigm is it represents everything as an object so it represents the life around us as it is. This makes the code more readable, Because it abstract the data and encapsulate it.

Every object has its own data and methods inside it. You can protect your data from external modification, So the only thing that can access the object data is its methods which makes us avoid security issues.

This is all a very big plus for OOP, But OOP like everything has its advantages and disadvantages. The main disadvantage of OOP is that it loses the speed of execution which procedural programming provides.

This is the flow chart of the program:



Results

The code

```
#include <bits/stdc++.h>
using namespace std;

class Person{
private:
    int PersonNumber;
    string PersonName;
    string PersonGender;
    string PersonResidence;
    int PersonAge;
    int Indx;
    float PersonHeatTemp[14];
public:
    static int NumberOfPersons;
    Person(){
        Indx = 0;
        PersonNumber = ++NumberOfPersons + 1;
        PersonName = "";
        PersonResidence = "";
```

```

    PersonAge = 0;
    for(int i=0; i<14; i++) PersonHeatTemp[i] = 0;
}
Person(string Name){
    Indx = 0;
    PersonNumber = ++NumberOfPersons + 1;
    PersonName = Name;
    PersonResidence = "";
    PersonAge = 0;
    for(int i=0; i<14; i++) PersonHeatTemp[i] = 0;
}
void InsertName(string Name){
    PersonName = Name;
}
void InsertGender(string Gender){
    PersonGender = Gender;
}
void InsertResidence(string Residence){
    PersonResidence = Residence;
}
void InsertAge(int Age){
    PersonAge = Age;
}
void InsertHeatTemp(float HeatTemp,int Index){
    PersonHeatTemp[Index] = HeatTemp;
}
int GetAndIncrementIndx(){
    return Indx++;
}
int GetNumber(){
    return PersonNumber;
}
string GetName(){
    return PersonName;
}
string GetGender(){
    return PersonGender;
}
string GetResidence(){
    return PersonResidence;
}

```

```

    }
    int GetAge(){
        return PersonAge;
    }
    float GetHeatTempOfIndx(int Index){
        return PersonHeatTemp[Index-1];
    }
    float* GetAllHeatTemps(){
        return PersonHeatTemp;
    }
    float GetAverageHeatTemp(){
        float sum = 0;
        for(int i=0;i<14;i++) sum += PersonHeatTemp[i];
        return (sum/Indx);
    }
};

int Person::NumberOfPersons = 0;

int main(void)
{
    Person person1,person2,person3,person4,person5;
    int Option;
    int ID = 0;
    while(true){
        cout << "Heat Temperature Follow in the Quarantine System" << endl << endl;
        cout << "\tOptions:" << endl;
        cout << "\t\t1. Insert a new person." << endl;
        cout << "\t\t2. Add today's temperature for existing person." << endl;
        cout << "\t\t3. Display a person." << endl;
        cout << "\t\t4. Edit a person information(Name, Age, Residence, or Temperature)."
        << endl;
        cout << "\t\t5. Exit the System." << endl;
        cout << "\tChoose Option: ";
        cin >> Option;
        if(Option==1){
            string name,gender,residence,YoN;
            int age; float temp;
            cout << "You can add up to 5 persons in the system. There is " << ID << "
persons in the system, now!" << endl;
            if(ID == Person::NumberOfPersons) { cout<< "There is no capacity to store

```

```

more"; continue;}

    cout << "Enter the person's name: ";
    cin >> name;
    ID++;
    if(ID == 1){
        person1.InsertName(name);
        cout << "Enter Age(if not exist Enter 0): ";
        cin >> age;
        person1.InsertAge(age);
        cout << "Enter Gender(if not exist Enter N/A): ";
        cin >> gender;
        person1.InsertGender(gender);
        cout << "Enter Residence(if not exist Enter N/A): ";
        cin >> residence;
        person1.InsertResidence(residence);
        cout << "Do you want insert today's heat temperature of this
person(yes/no): ";
        cin >> YoN;
        if(YoN == "yes") {
            cout << "Enter The Heat Temperature: ";
            cin >> temp;
            person1.InsertHeatTemp(temp, person1.GetAndIncrementIndx());
        }
        cout << "The Person is inserted successfully." << endl;
    }
    else if (ID == 2){
        person2.InsertName(name);
        cout << "Enter Age(if not exist Enter 0): ";
        cin >> age;
        person2.InsertAge(age);
        cout << "Enter Gender(if not exist Enter N/A): ";
        cin >> gender;
        person2.InsertGender(gender);
        cout << "Enter Residence(if not exist Enter N/A): ";
        cin >> residence;
        person2.InsertResidence(residence);
        cout << "Do you want insert today's heat temperature of this
person(yes/no): ";
        cin >> YoN;
        if(YoN == "yes") {

```

```

        cout << "Enter The Heat Temperature: ";
        cin >> temp;
        person2.InsertHeatTemp(temp, person2.GetAndIncrementIndx());
    }
    cout << "The Person is inserted successfully." << endl;
}
else if (ID == 3){
    person3.InsertName(name);
    cout << "Enter Age(if not exist Enter 0): ";
    cin >> age;
    person3.InsertAge(age);
    cout << "Enter Gender(if not exist Enter N/A): ";
    cin >> gender;
    person3.InsertGender(gender);
    cout << "Enter Residence(if not exist Enter N/A): ";
    cin >> residence;
    person3.InsertResidence(residence);
    cout << "Do you want insert today's heat temperature of this
person(yes/no): ";
    cin >> YoN;
    if(YoN == "yes") {
        cout << "Enter The Heat Temperature: ";
        cin >> temp;
        person3.InsertHeatTemp(temp, person3.GetAndIncrementIndx());
    }
    cout << "The Person is inserted successfully." << endl;
}
else if (ID == 4){
    person4.InsertName(name);
    cout << "Enter Age(if not exist Enter 0): ";
    cin >> age;
    person4.InsertAge(age);
    cout << "Enter Gender(if not exist Enter N/A): ";
    cin >> gender;
    person4.InsertGender(gender);
    cout << "Enter Residence(if not exist Enter N/A): ";
    cin >> residence;
    person4.InsertResidence(residence);
    cout << "Do you want insert today's heat temperature of this
person(yes/no): ";

```

```

        cin >> YoN;
        if(YoN == "yes") {
            cout << "Enter The Heat Temperature: ";
            cin >> temp;
            person4.InsertHeatTemp(temp, person4.GetAndIncrementIndx());
        }
        cout << "The Person is inserted successfully." << endl;
    }
    else if (ID == 5){
        person5.InsertName(name);
        cout << "Enter Age(if not exist Enter 0): ";
        cin >> age;
        person5.InsertAge(age);
        cout << "Enter Gender(if not exist Enter N/A): ";
        cin >> gender;
        person5.InsertGender(gender);
        cout << "Enter Residence(if not exist Enter N/A): ";
        cin >> residence;
        person5.InsertResidence(residence);
        cout << "Do you want insert today's heat temperature of this
person(yes/no): ";
        cin >> YoN;
        if(YoN == "yes") {
            cout << "Enter The Heat Temperature: ";
            cin >> temp;
            person5.InsertHeatTemp(temp, person5.GetAndIncrementIndx());
        }
        cout << "The Person is inserted successfully." << endl;
    }
}
else if (Option == 2){
    string name;
    float temp;
    cout << "Enter the person name: ";
    cin >> name;
    cout << "Enter The Heat Temperature: ";
    cin >> temp;
    if(name == person1.GetName() )
        person1.InsertHeatTemp(temp, person1.GetAndIncrementIndx());
    else if(name == person2.GetName() )

```



```

        person2.InsertHeatTemp(temp, person2.GetAndIncrementIndx());
    else if(name == person3.GetName() )
        person3.InsertHeatTemp(temp, person3.GetAndIncrementIndx());
    else if(name == person4.GetName() )
        person4.InsertHeatTemp(temp, person4.GetAndIncrementIndx());
    else if(name == person5.GetName() )
        person5.InsertHeatTemp(temp, person5.GetAndIncrementIndx());
    else
        cout << "The name you entered is not exist.";
}
else if(Option == 3){
    string name;
    cout << "Enter the person name: ";
    cin >> name;
    if(name == person1.GetName() ){
        cout << "Person number: " << person1.GetNumber() << endl;
        cout << "person name: " << person1.GetName() << endl;
        cout << "person age: " << person1.GetAge() << endl;
        cout << "person gender: " << person1.GetGender() << endl;
        cout << "person residence: " << person1.GetResidence() << endl;
        cout << "person Heat Temperature: ";
        float* p = person1.GetAllHeatTemps();
        for (int i = 0; i < 14; i++) cout << *(p + i) << " ";
        cout << endl << "Person average temperature: " <<
person1.GetAverageHeatTemp() << endl << endl ;
    }
    else if(name == person2.GetName() ){
        cout << "Person number: " << person2.GetNumber() << endl;
        cout << "person name: " << person2.GetName() << endl;
        cout << "person age: " << person2.GetAge() << endl;
        cout << "person gender: " << person2.GetGender() << endl;
        cout << "person residence: " << person2.GetResidence() << endl;
        cout << "person Heat Temperature: ";
        float* p = person2.GetAllHeatTemps();
        for (int i = 0; i < 14; i++) cout << *(p + i) << " ";
        cout << endl << "Person average temperature: " <<
person2.GetAverageHeatTemp() << endl << endl ;
    }
    else if(name == person3.GetName() ){
        cout << "Person number: " << person3.GetNumber() << endl;

```

```

        cout << "person name: " << person3.GetName() << endl;
        cout << "person age: " << person3.GetAge() << endl;
        cout << "person gender: " << person3.GetGender() << endl;
        cout << "person residence: " << person3.GetResidence() << endl;
        cout << "person Heat Temperature: ";
        float* p = person3.GetAllHeatTemps();
        for (int i = 0; i < 14; i++) cout << *(p + i) << " ";
        cout << endl << "Person average temperature: " <<
person3.GetAverageHeatTemp() << endl << endl ;
    }
    else if(name == person4.GetName() ){
        cout << "Person number: " << person4.GetNumber() << endl;
        cout << "person name: " << person4.GetName() << endl;
        cout << "person age: " << person4.GetAge() << endl;
        cout << "person gender: " << person4.GetGender() << endl;
        cout << "person residence: " << person4.GetResidence() << endl;
        cout << "person Heat Temperature: ";
        float* p = person4.GetAllHeatTemps();
        for (int i = 0; i < 14; i++) cout << *(p + i) << " ";
        cout << endl << "Person average temperature: " <<
person4.GetAverageHeatTemp() << endl << endl ;
    }
    else if(name == person5.GetName() ){
        cout << "Person number: " << person5.GetNumber() << endl;
        cout << "person name: " << person5.GetName() << endl;
        cout << "person age: " << person5.GetAge() << endl;
        cout << "person gender: " << person5.GetGender() << endl;
        cout << "person residence: " << person5.GetResidence() << endl;
        cout << "person Heat Temperature: ";
        float* p = person5.GetAllHeatTemps();
        for (int i = 0; i < 14; i++) cout << *(p + i) << " ";
        cout << endl << "Person average temperature: " <<
person5.GetAverageHeatTemp() << endl << endl ;
    }
    else{
        cout << "The name you entered is not exist.";
    }
}
else if(option == 4){
    string name, nam, gender, residence, option;

```

```

int idx, age;
float temperature;
cout << "Enter the person name: ";
cin >> name;
if(name == person1.GetName()){
    cout << "What do you want to modify? (Name, Age, Gender, Residence, or
Temperature of any day): ";
    cin >> option;
    if (option == "Name"){
        cout << "Enter the new name: ";
        cin >> nam;
        person1.InsertName(nam);
    }
    else if (option == "Age"){
        cout << "Enter the new age: ";
        cin >> age;
        person1.InsertAge(age);
    }
    else if (option == "Gender"){
        cout << "Enter the new Gender: ";
        cin >> gender;
        person1.InsertGender(gender);
    }
    else if (option == "Residence"){
        cout << "Enter the new residence: ";
        cin >> residence;
        person1.InsertResidence(residence);
    }
    else if (option == "Temperature"){
        cout << "Enter the new Heat temperature followed by the number of the
day: ";

        cin >> temperature >> idx;
        person1.InsertHeatTemp(temperature,idx-1);
    }
    else {
        cout << "The name you have entered does not match any person.";
    }
}
else if(name == person2.GetName() ){
    cout << "What do you want to modify? (Name, Age, Gender, Residence, or

```

```

Temperature of any day): ";
    cin >> option;
    if (option == "Name"){
        cout << "Enter the new name: ";
        cin >> nam;
        person2.InsertName(nam);
    }
    else if (option == "Age"){
        cout << "Enter the new age: ";
        cin >> age;
        person2.InsertAge(age);
    }
    else if (option == "Gender"){
        cout << "Enter the new Gender: ";
        cin >> gender;
        person2.InsertGender(gender);
    }
    else if (option == "Residence"){
        cout << "Enter the new residence: ";
        cin >> residence;
        person2.InsertResidence(residence);
    }
    else if (option == "Temperature"){
        cout << "Enter the new Heat temperature followed by the number of the
day: ";

        cin >> temperature >> idx;
        person2.InsertHeatTemp(temperature,idx-1);
    }
    else {
        cout << "The name you have entered does not match any person.";
    }
}
else if(name == person3.GetName() ){
    cout << "What do you want to modify? (Name, Age, Gender, Residence, or
Temperature of any day): ";
    cin >> option;
    if (option == "Name"){
        cout << "Enter the new name: ";
        cin >> nam;
        person3.InsertName(nam);
    }
}

```

```

    }
    else if (option == "Age"){
        cout << "Enter the new age: ";
        cin >> age;
        person3.InsertAge(age);
    }
    else if (option == "Gender"){
        cout << "Enter the new Gender: ";
        cin >> gender;
        person3.InsertGender(gender);
    }
    else if (option == "Residence"){
        cout << "Enter the new residence: ";
        cin >> residence;
        person3.InsertResidence(residence);
    }
    else if (option == "Temperature"){
        cout << "Enter the new Heat temperature followed by the number of the
day: ";

        cin >> temperature >> idx;
        person3.InsertHeatTemp(temperature,idx-1);
    }
    else {
        cout << "The name you have entered does not match any person.";
    }
}
else if(name == person4.GetName() ){
    cout << "What do you want to modify? (Name, Age, Gender, Residence, or
Temperature of any day): ";
    cin >> option;
    if (option == "Name"){
        cout << "Enter the new name: ";
        cin >> nam;
        person4.InsertName(nam);
    }
    else if (option == "Age"){
        cout << "Enter the new age: ";
        cin >> age;
        person4.InsertAge(age);
    }
}

```

```

        else if (option == "Gender"){
            cout << "Enter the new Gender: ";
            cin >> gender;
            person4.InsertGender(gender);
        }
        else if (option == "Residence"){
            cout << "Enter the new residence: ";
            cin >> residence;
            person4.InsertResidence(residence);
        }
        else if (option == "Temperature"){
            cout << "Enter the new Heat temperature followed by the number of the
day: ";

            cin >> temperature >> idx;
            person4.InsertHeatTemp(temperature,idx-1);
        }
        else {
            cout << "The name you have entered does not match any person.";
        }
    }
    else if(name == person5.GetName() ){
        cout << "What do you want to modify? (Name, Age, Gender, Residence, or
Temperature of any day): ";
        cin >> option;
        if (option == "Name"){
            cout << "Enter the new name: ";
            cin >> nam;
            person5.InsertName(nam);
        }
        else if (option == "Age"){
            cout << "Enter the new age: ";
            cin >> age;
            person5.InsertAge(age);
        }
        else if (option == "Gender"){
            cout << "Enter the new Gender: ";
            cin >> gender;
            person5.InsertGender(gender);
        }
        else if (option == "Residence"){

```

```

        cout << "Enter the new residence: ";
        cin >> residence;
        person5.InsertResidence(residence);
    }
    else if (option == "Temperature"){
        cout << "Enter the new Heat temperature followed by the number of the
day: ";

        cin >> temperature >> idx;
        person5.InsertHeatTemp(temperature,idx-1);
    }
    else {
        cout << "The name you have entered does not match any person.";
    }
}
else
    cout << "The name you entered is not exist.";
}
else if (Option == 5){
    return 0;
}
else{
    cout << "The option you have entered does not match any valid option!" <<
endl;
}
cout << endl << endl;
}
return 0;
}

```

Discussion

The system in action:

```
D:\Algorithms\OOP-Project\main.exe
Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 1
You can add up to 5 persons in the system. There is 0 persons in the system, now!
Enter the person's name: Hassan
Enter Age(if not exist Enter 0): 19
Enter Gender(if not exist Enter N/A): male
Enter Residence(if not exist Enter N/A): Zagazig
Do you want insert today's heat temperature of this person(yes/no): yes
Enter the Heat Temperature: 38.6
The Person is inserted successfully.

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 1
You can add up to 5 persons in the system. There is 1 persons in the system, now!
Enter the person's name: Yara
Enter Age(if not exist Enter 0): 17
Enter Gender(if not exist Enter N/A): Female
Enter Residence(if not exist Enter N/A): Mansoura
Do you want insert today's heat temperature of this person(yes/no): yes
Enter the Heat Temperature: 37
The Person is inserted successfully.

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 2
Enter the person name: Hassan
Enter the Heat Temperature: 36.3

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.
```

```
D:\Algorithms\OOP-Project\main.exe
Enter the Heat Temperature: 36.3

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 3
Enter the person name: Hassan
Person number: 2
person name: Hassan
person age: 19
person gender: male
person residence: Zagazig
person Heat Temperature: 38.6 36.3 0 0 0 0 0 0 0 0 0 0
Person average temperature: 37.45

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 3
Enter the person name: Yara
Person number: 3
person name: Yara
person age: 17
person gender: Female
person residence: Mansoura
person Heat Temperature: 37 0 0 0 0 0 0 0 0 0 0
Person average temperature: 37

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 4
Enter the person name: Yara
What do you want to modify? (Name, Age, Gender, Residence, or Temperature): Residence
Enter the new residence: Cairo

Heat Temperature Follow in the Quarantine System
```



```

D:\Algorithms\OOP-Project\main.exe
Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 1
Enter the person name: Yara
Person number: 3
person name: Yara
person age: 17
person gender: Female
person residence: Cairo
person Heat Temperature: 37.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Person average temperature: 37

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 4
Enter the person name: Hassan
What do you want to modify? (Name, Age, Gender, Residence, or Temperature of any day): Temperature
Enter the new Heat temperature followed by the number of the day: 37.2 2

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 1
Enter the person name: Hassan
Person number: 2
person name: Hassan
person age: 19
person gender: male
person residence: Zagazig
person Heat Temperature: 38.6 37.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Person average temperature: 37.9

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.

```

```

Heat Temperature Follow in the Quarantine System

Options:
1. Insert a new person.
2. Add today's temperature for existing person.
3. Display a person.
4. Edit a person information(Name, Age, Residence, or Temperature).
5. Exit the System.

Choose Option: 5
Process returned 0 (0x0)   execution time : 488.158 s
Press any key to continue.

```

Conclusion

This is the diagram for the person class that used to create some person objects to track their heat temperature and for sure their information.

Person
<i>PersonNumber</i> <i>PersonName</i> <i>PersonGender</i> <i>PersonResidence</i> <i>PersonAge</i> <i>Indx</i> <i>PersonHeatTemp[14]</i> <i>NumberOfPersons</i>
<i>Person()</i> <i>InsertName()</i> <i>InsertGender()</i> <i>InsertResidence</i> <i>InsertAge()</i> <i>InsertHeatTemp()</i> <i>GetAndIncrementIndx()</i> <i>GetNumber()</i> <i>GetName()</i> <i>GetGender()</i> <i>GetResidence()</i> <i>GetAge()</i> <i>GetHeatTempOfIndx()</i> <i>GetAllHeatTemps()</i> <i>GetAverageHeatTemp()</i>

When we create a new person:

The object initialized and the number of persons incremented by one directly. Then we can add today's temperature for that person, then we can add the next day's temperature and so on only by inserting the value. Whether we get wrong and assign a wrong value we can simply edit this value by choosing the option and write the right value, with the same strategy we can edit any piece of information we got wrong with. The average temperature is calculated directly when we insert a new temperature, it is calculated over the existing days inserted. in the system for one person. We can also display a person to check any piece of information we want for any one

person registered. Finally we can exit the system..

References

1. Lafore, R. W., Waite Group, & Waite Group. (2002). Object-oriented Programming in C++ (4th Edition). San Jose, US: Sams.