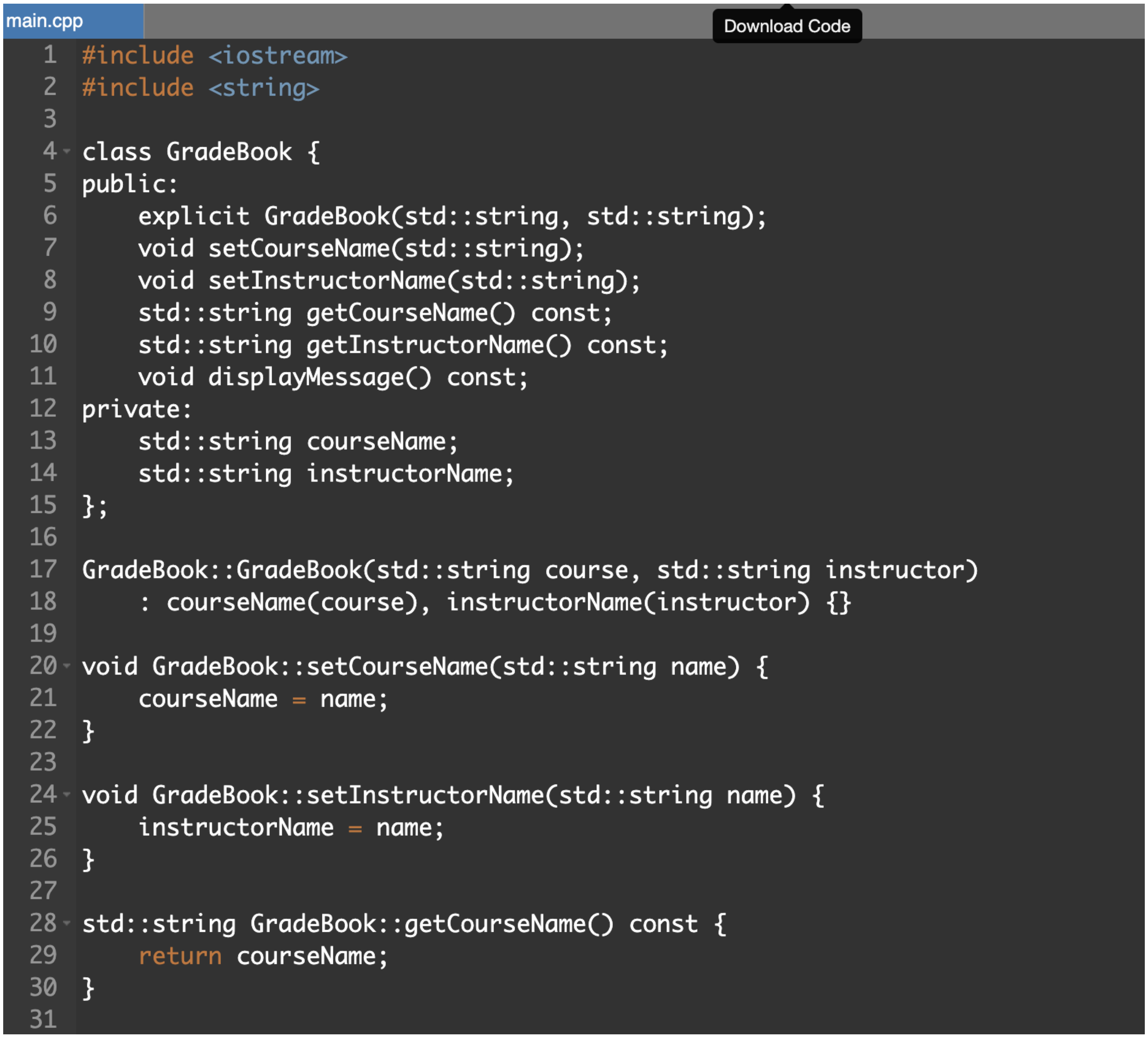
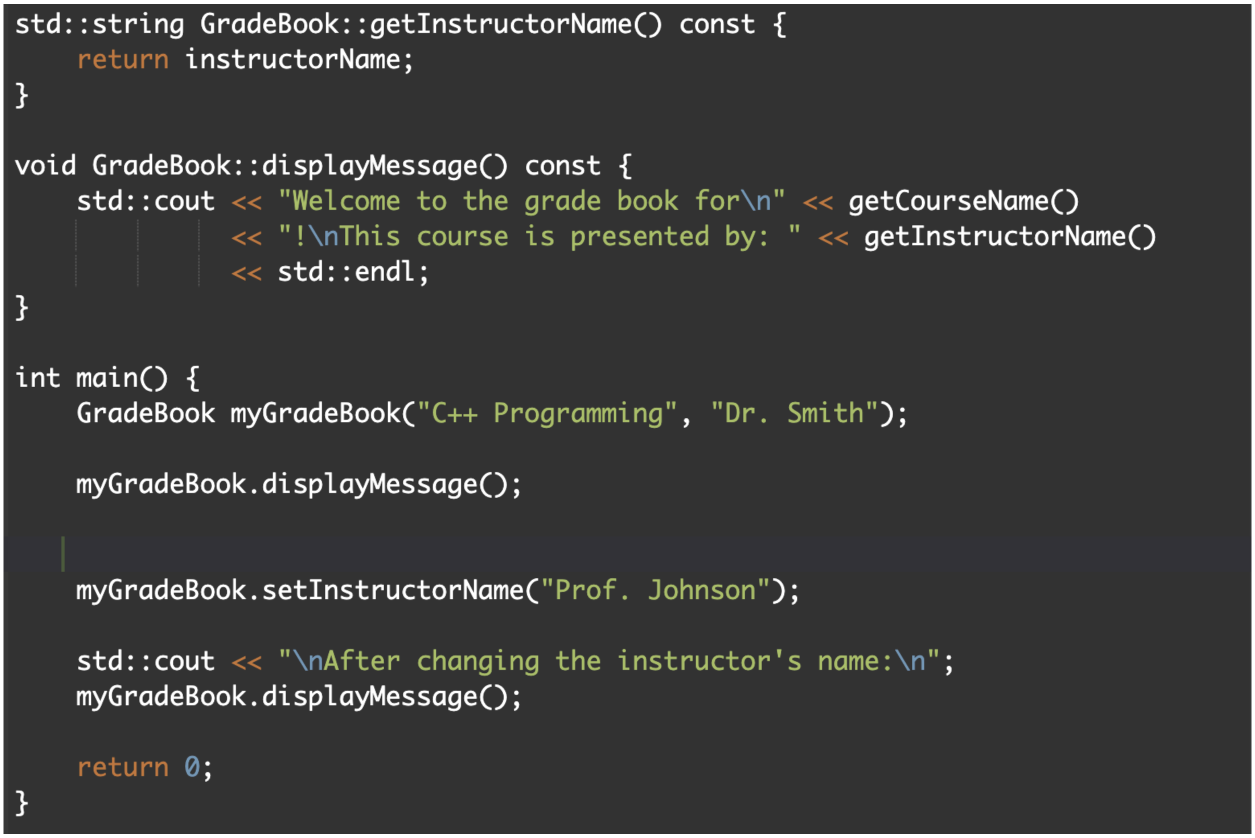
Samir Khadka
CS360 - Programming in C and C++
Assignment 2

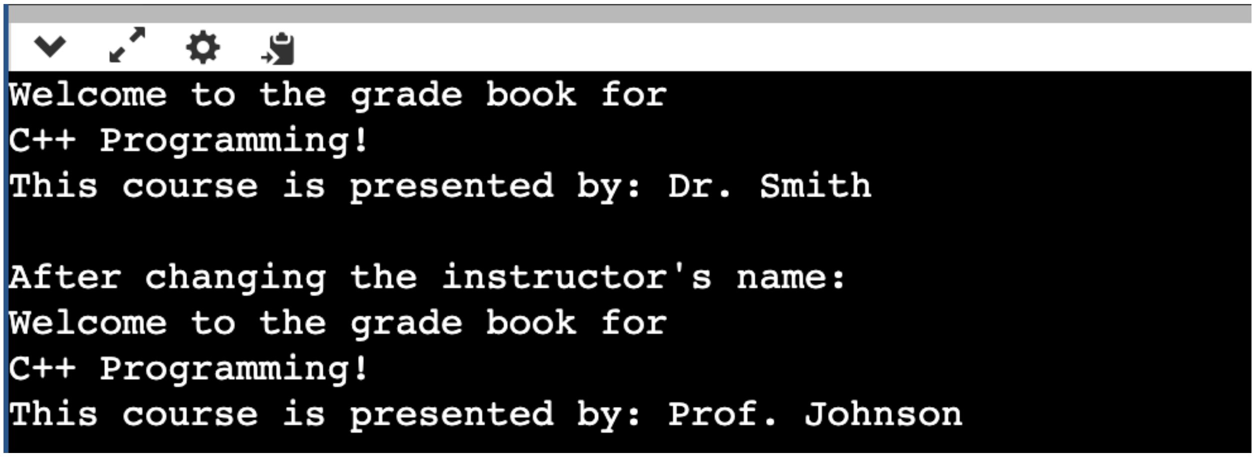
1. Answer



```cpp
#include <iostream>
#include <string>

class GradeBook {
public:
    explicit GradeBook(std::string, std::string);
    void setCourseName(std::string);
    void setInstructorName(std::string);
    std::string getCourseName() const;
    std::string getInstructorName() const;
    void displayMessage() const;
private:
    std::string courseName;
    std::string instructorName;
};

GradeBook::GradeBook(std::string course, std::string instructor)
    : courseName(course), instructorName(instructor) {}

void GradeBook::setCourseName(std::string name) {
    courseName = name;
}

void GradeBook::setInstructorName(std::string name) {
    instructorName = name;
}

std::string GradeBook::getCourseName() const {
    return courseName;
}

```

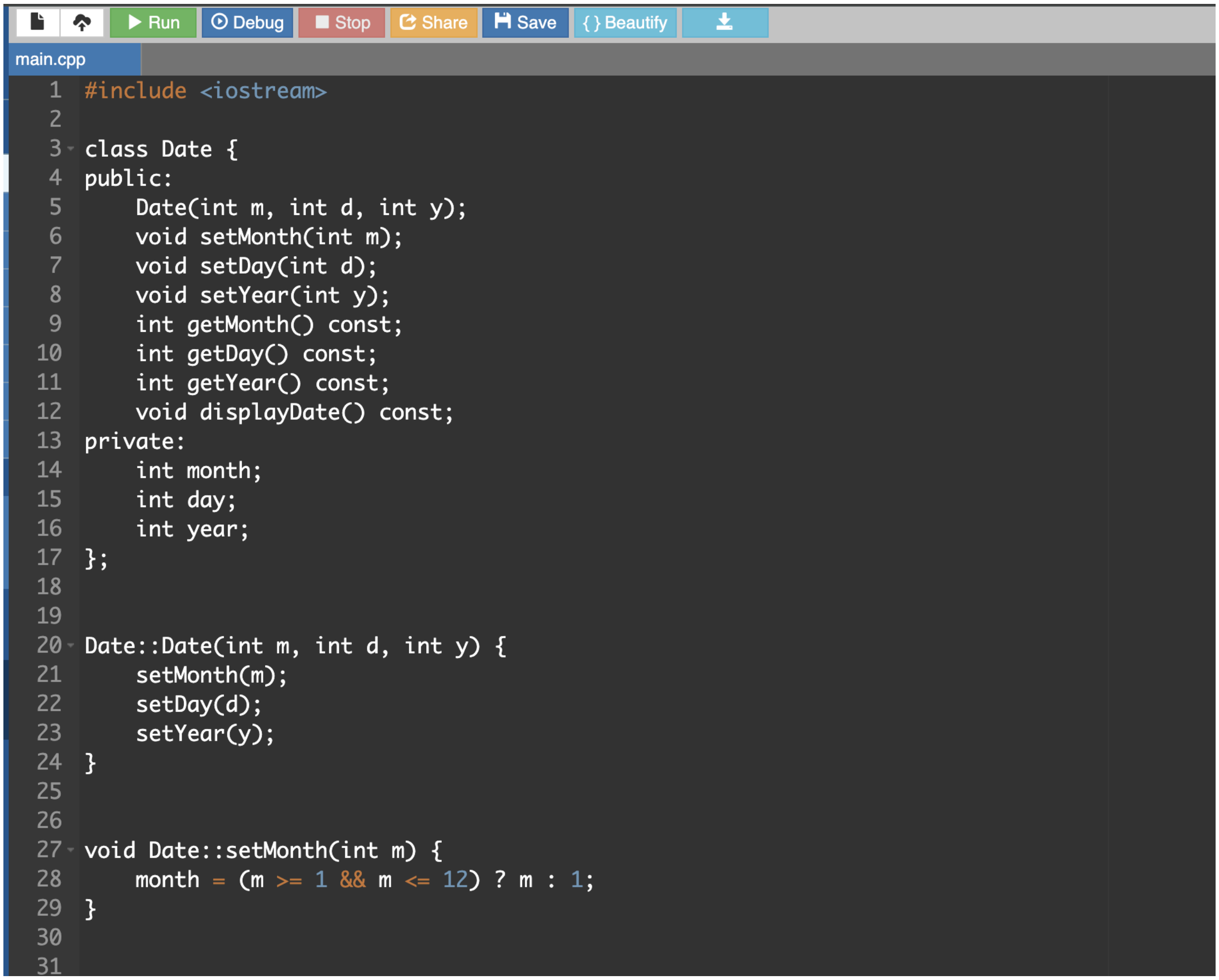


```
std::string GradeBook::getInstructorName() const {
    return instructorName;
}

void GradeBook::displayMessage() const {
    std::cout << "Welcome to the grade book for\n" << getCourseName()
              << "!\nThis course is presented by: " << getInstructorName()
              << std::endl;
}

int main() {
    GradeBook myGradeBook("C++ Programming", "Dr. Smith");

    myGradeBook.displayMessage();


    myGradeBook.setInstructorName("Prof. Johnson");

    std::cout << "\nAfter changing the instructor's name:\n";
    myGradeBook.displayMessage();

    return 0;
}
```

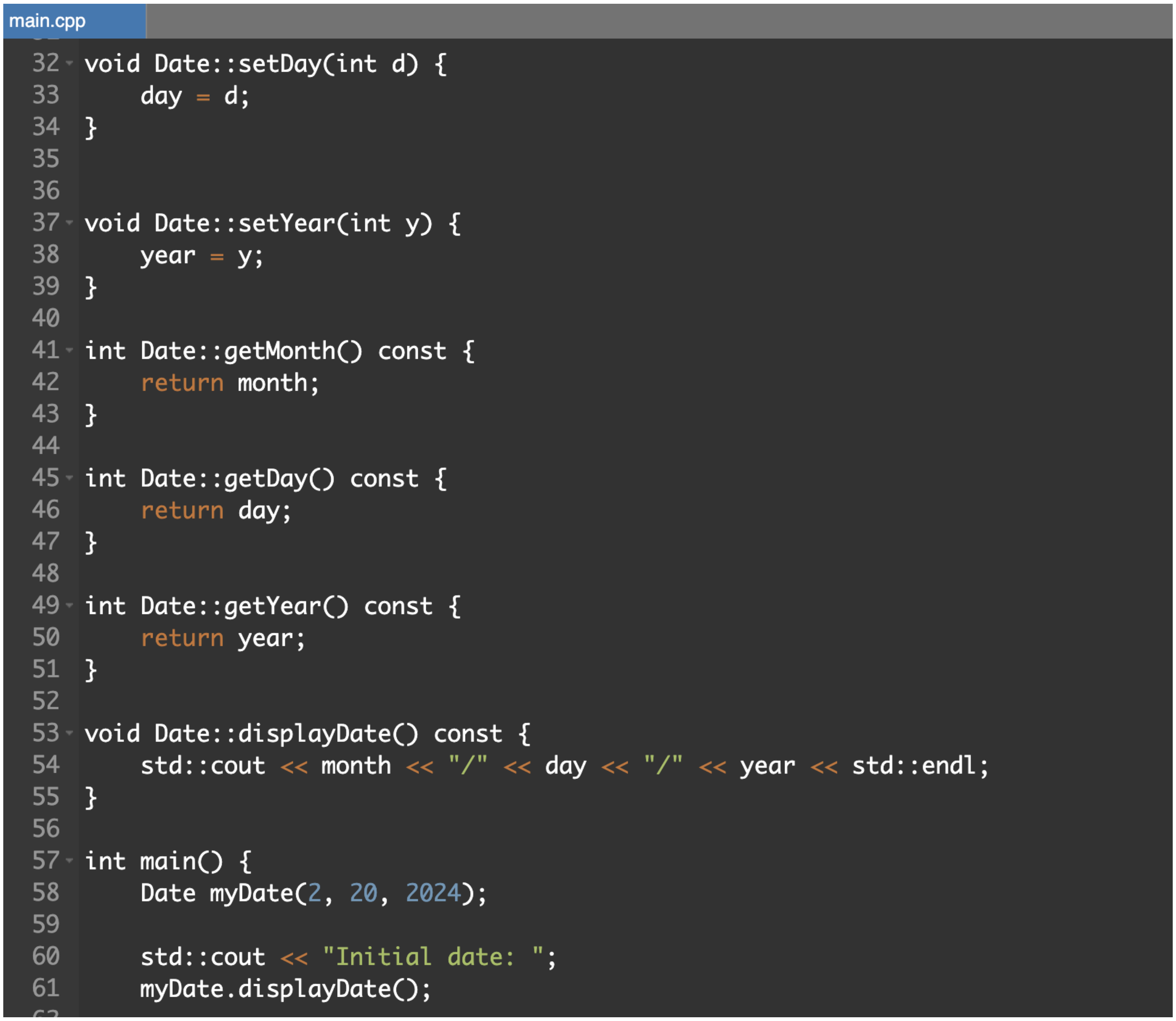


```
Welcome to the grade book for
C++ Programming!
This course is presented by: Dr. Smith

After changing the instructor's name:
Welcome to the grade book for
C++ Programming!
This course is presented by: Prof. Johnson
```

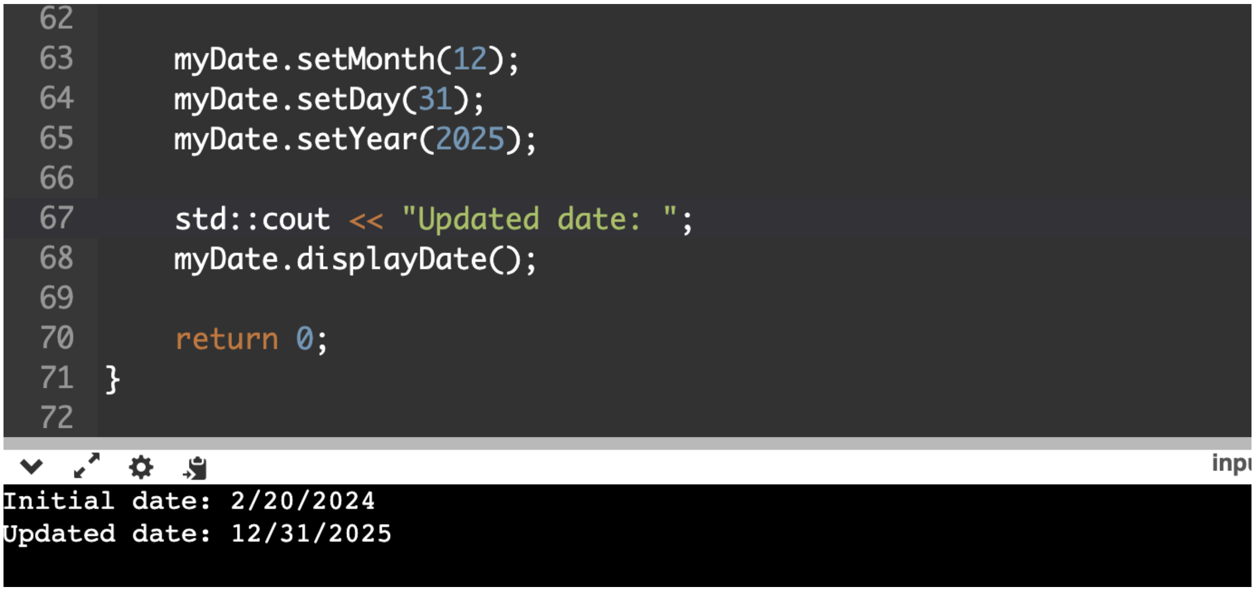
2. Answer:



```cpp
#include <iostream>

class Date {
public:
    Date(int m, int d, int y);
    void setMonth(int m);
    void setDay(int d);
    void setYear(int y);
    int getMonth() const;
    int getDay() const;
    int getYear() const;
    void displayDate() const;
private:
    int month;
    int day;
    int year;
};


Date::Date(int m, int d, int y) {
    setMonth(m);
    setDay(d);
    setYear(y);
}


void Date::setMonth(int m) {
    month = (m >= 1 && m <= 12) ? m : 1;
}


```



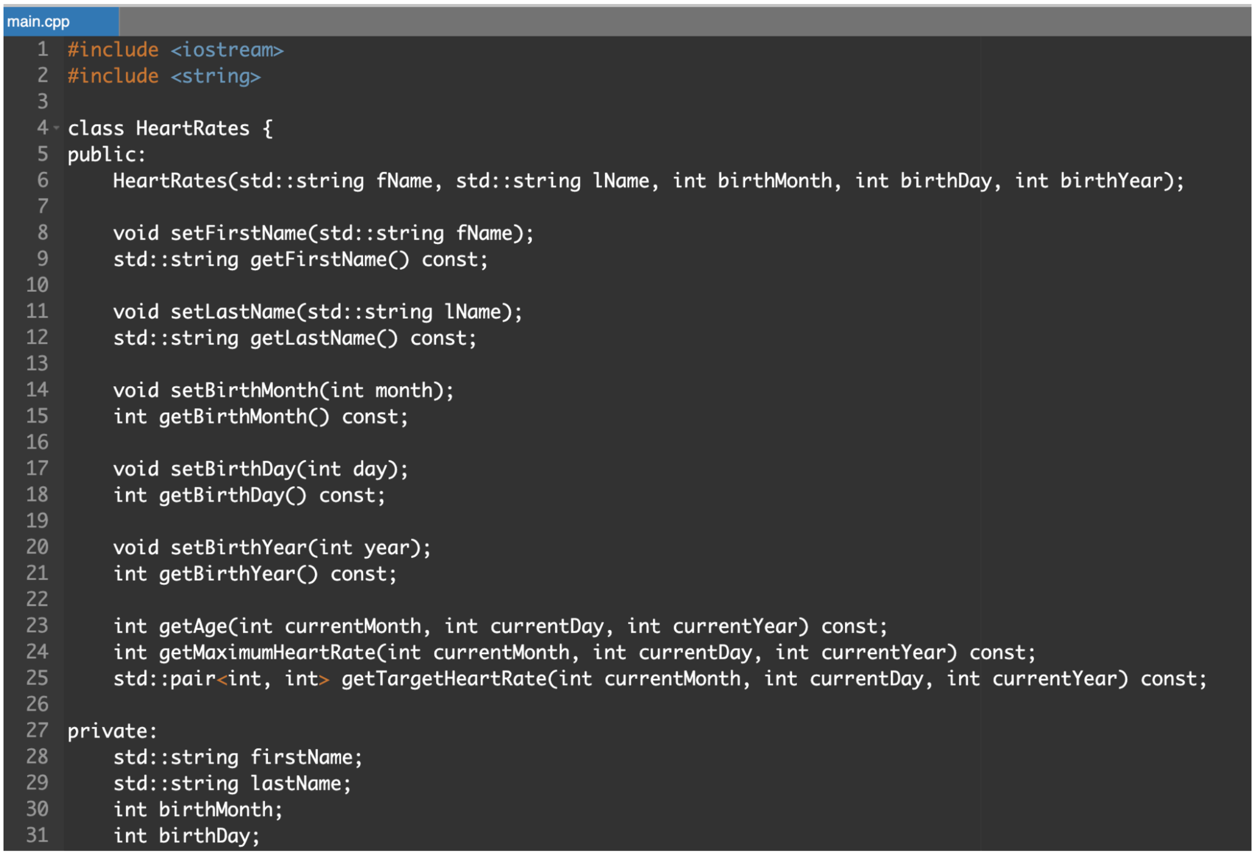
```cpp
void Date::setDay(int d) {
    day = d;
}


void Date::setYear(int y) {
    year = y;
}

int Date::getMonth() const {
    return month;
}

int Date::getDay() const {
    return day;
}

int Date::getYear() const {
    return year;
}

void Date::displayDate() const {
    std::cout << month << "/" << day << "/" << year << std::endl;
}

int main() {
    Date myDate(2, 20, 2024);

    std::cout << "Initial date: ";
    myDate.displayDate();
```



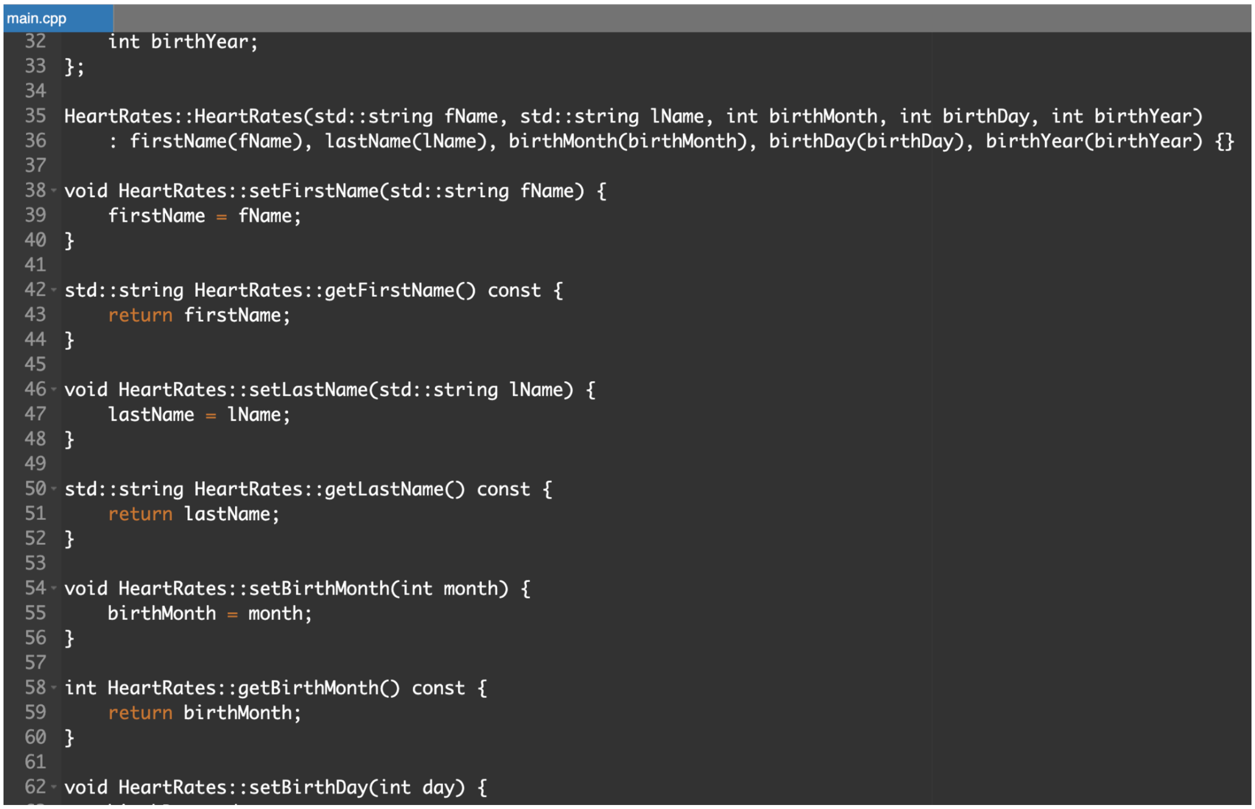
```cpp

    myDate.setMonth(12);
    myDate.setDay(31);
    myDate.setYear(2025);

    std::cout << "Updated date: ";
    myDate.displayDate();

    return 0;
}

```

```
Initial date: 2/20/2024
Updated date: 12/31/2025
```

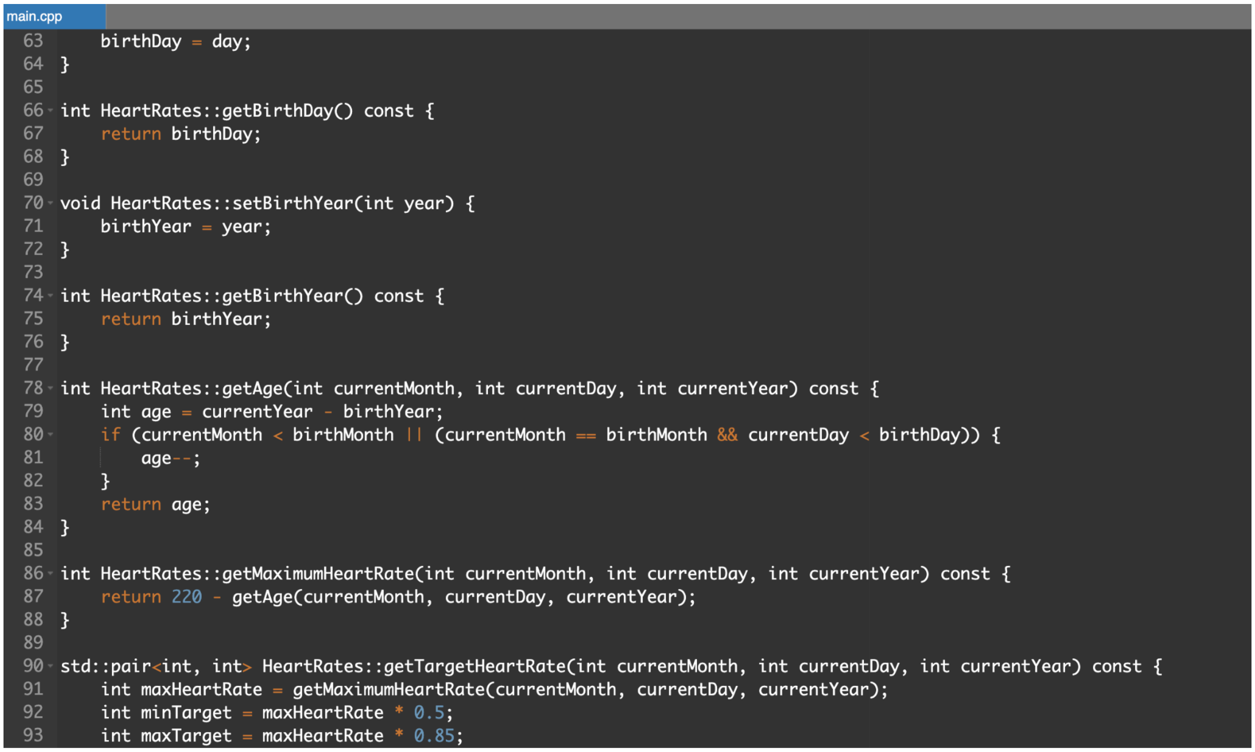
3. Answer:



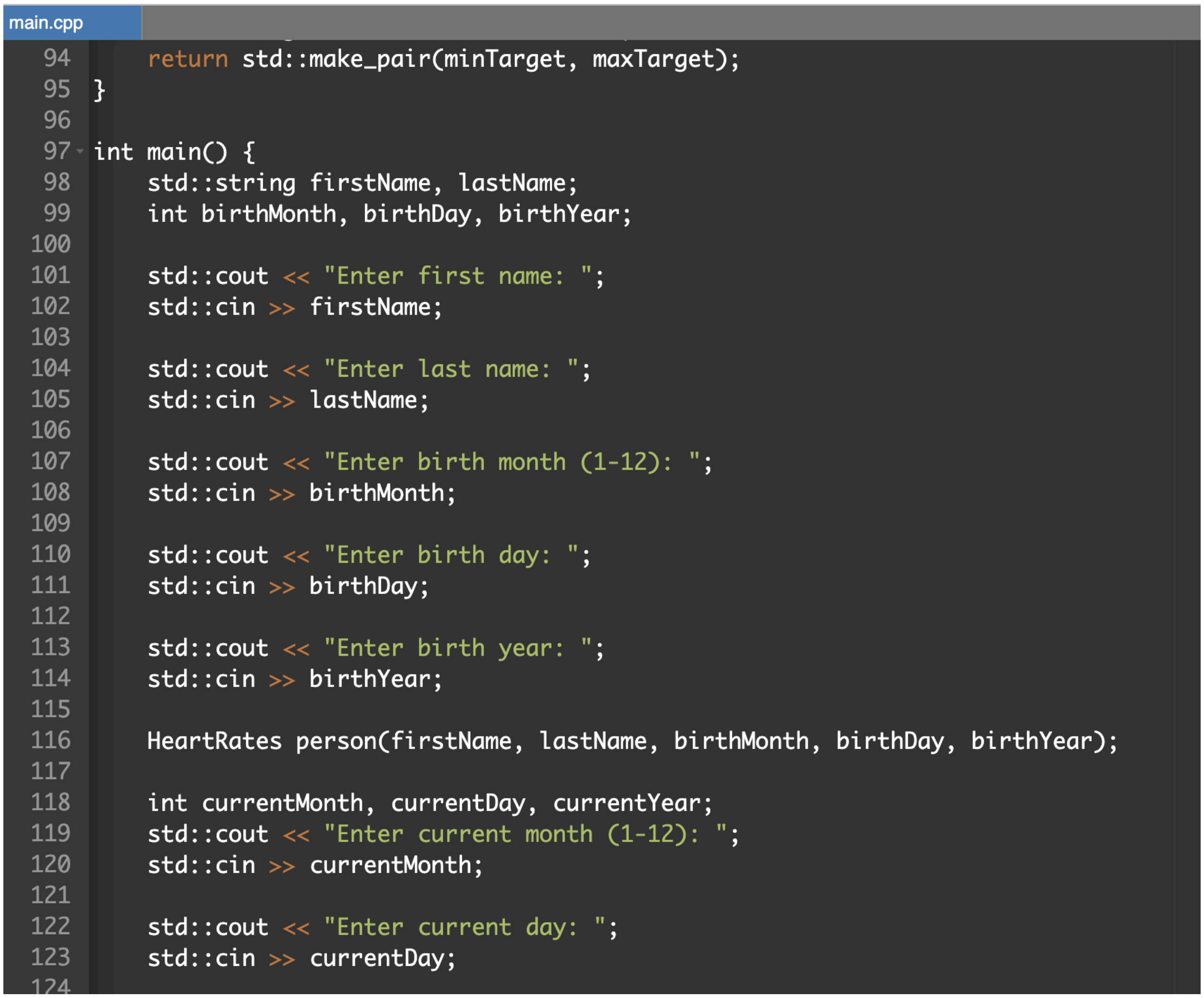
```cpp
#include <iostream>
#include <string>

class HeartRates {
public:
    HeartRates(std::string fName, std::string lName, int birthMonth, int birthDay, int birthYear);

    void setFirstName(std::string fName);
    std::string getFirstName() const;

    void setLastName(std::string lName);
    std::string getLastName() const;

    void setBirthMonth(int month);
    int getBirthMonth() const;

    void setBirthDay(int day);
    int getBirthDay() const;

    void setBirthYear(int year);
    int getBirthYear() const;

    int getAge(int currentMonth, int currentDay, int currentYear) const;
    int getMaximumHeartRate(int currentMonth, int currentDay, int currentYear) const;
    std::pair<int, int> getTargetHeartRate(int currentMonth, int currentDay, int currentYear) const;

private:
    std::string firstName;
    std::string lastName;
    int birthMonth;
    int birthDay;
```



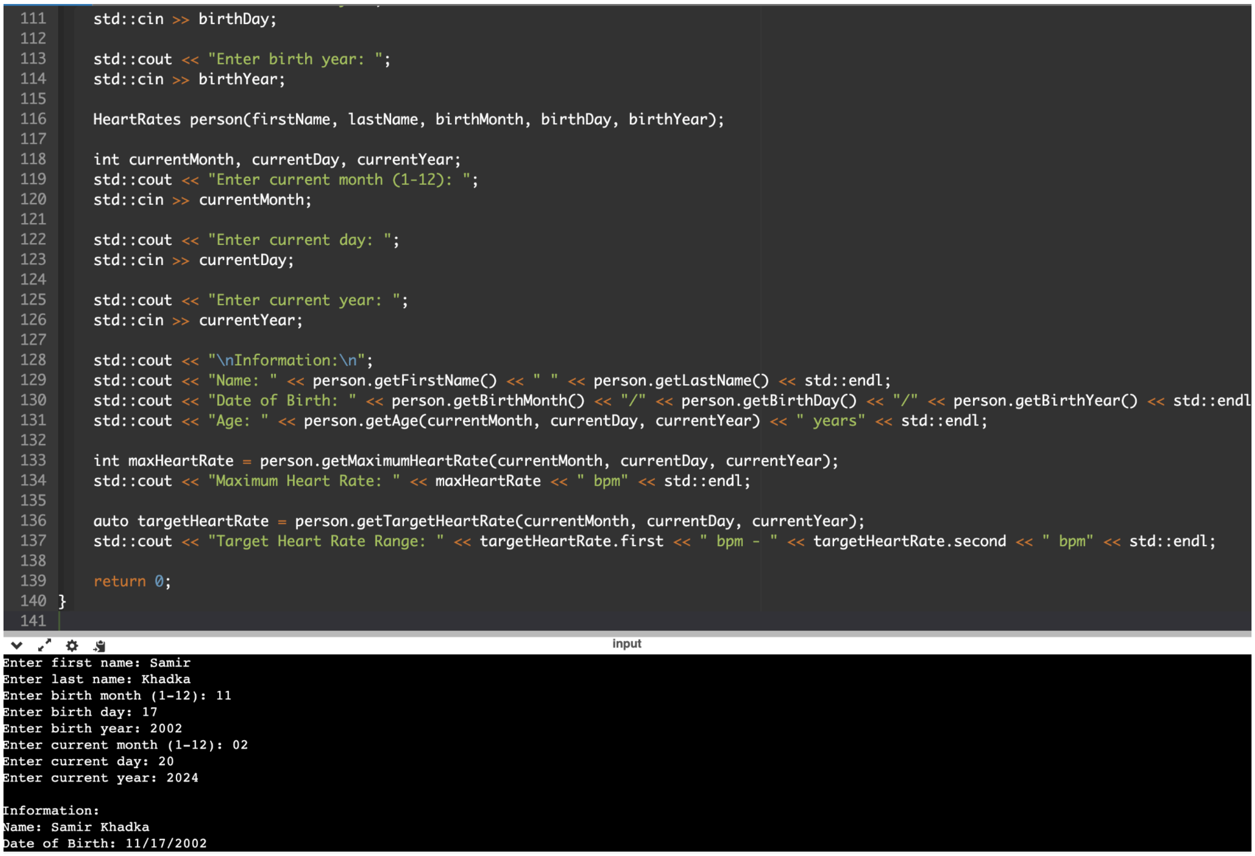
```cpp
    int birthYear;
};

HeartRates::HeartRates(std::string fName, std::string lName, int birthMonth, int birthDay, int birthYear)
    : firstName(fName), lastName(lName), birthMonth(birthMonth), birthDay(birthDay), birthYear(birthYear) {}

void HeartRates::setFirstName(std::string fName) {
    firstName = fName;
}

std::string HeartRates::getFirstName() const {
    return firstName;
}

void HeartRates::setLastName(std::string lName) {
    lastName = lName;
}

std::string HeartRates::getLastName() const {
    return lastName;
}

void HeartRates::setBirthMonth(int month) {
    birthMonth = month;
}

int HeartRates::getBirthMonth() const {
    return birthMonth;
}

void HeartRates::setBirthDay(int day) {
```



```cpp
    birthDay = day;
}

int HeartRates::getBirthDay() const {
    return birthDay;
}

void HeartRates::setBirthYear(int year) {
    birthYear = year;
}

int HeartRates::getBirthYear() const {
    return birthYear;
}

int HeartRates::getAge(int currentMonth, int currentDay, int currentYear) const {
    int age = currentYear - birthYear;
    if (currentMonth < birthMonth || (currentMonth == birthMonth && currentDay < birthDay)) {
        age--;
    }
    return age;
}

int HeartRates::getMaximumHeartRate(int currentMonth, int currentDay, int currentYear) const {
    return 220 - getAge(currentMonth, currentDay, currentYear);
}

std::pair<int, int> HeartRates::getTargetHeartRate(int currentMonth, int currentDay, int currentYear) const {
    int maxHeartRate = getMaximumHeartRate(currentMonth, currentDay, currentYear);
    int minTarget = maxHeartRate * 0.5;
    int maxTarget = maxHeartRate * 0.85;
```

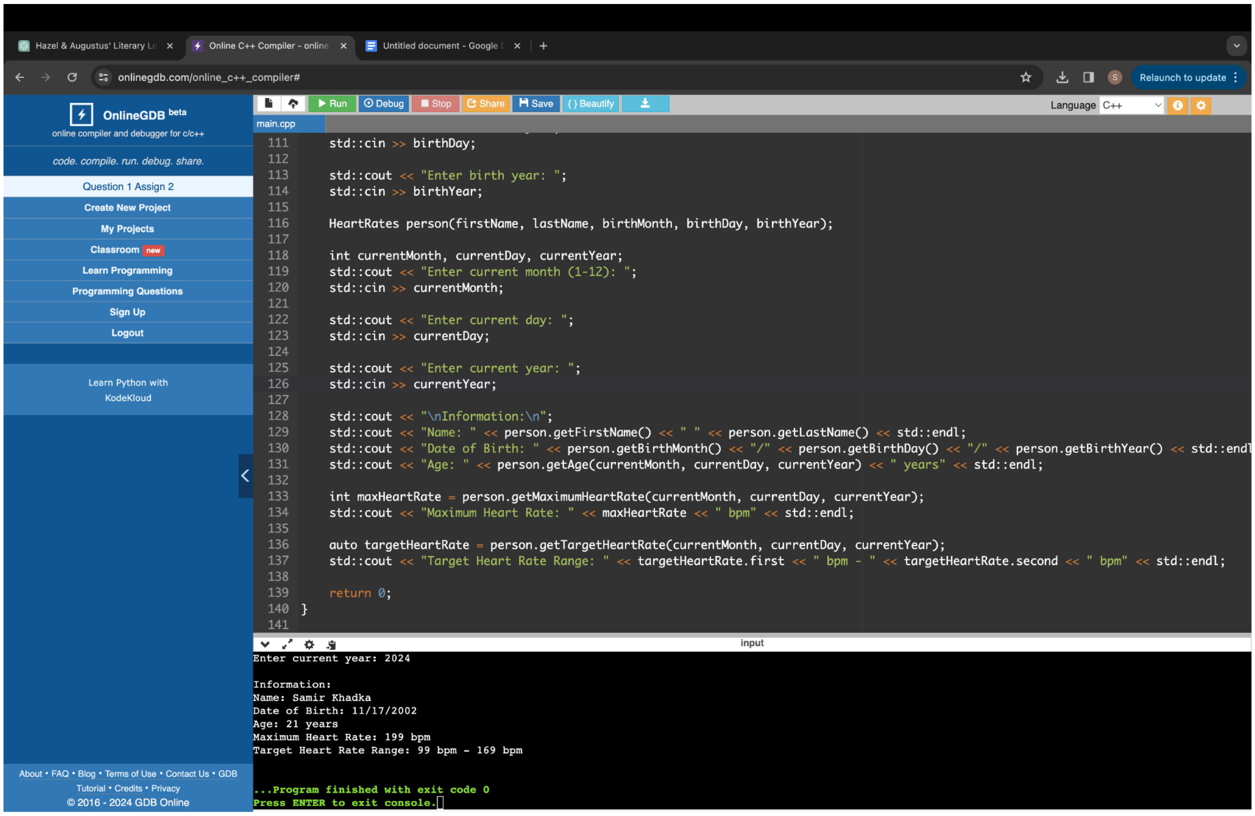


```cpp
    return std::make_pair(minTarget, maxTarget);
}

int main() {
    std::string firstName, lastName;
    int birthMonth, birthDay, birthYear;

    std::cout << "Enter first name: ";
    std::cin >> firstName;

    std::cout << "Enter last name: ";
    std::cin >> lastName;

    std::cout << "Enter birth month (1-12): ";
    std::cin >> birthMonth;

    std::cout << "Enter birth day: ";
    std::cin >> birthDay;

    std::cout << "Enter birth year: ";
    std::cin >> birthYear;

    HeartRates person(firstName, lastName, birthMonth, birthDay, birthYear);

    int currentMonth, currentDay, currentYear;
    std::cout << "Enter current month (1-12): ";
    std::cin >> currentMonth;

    std::cout << "Enter current day: ";
    std::cin >> currentDay;

```



```cpp
    std::cin >> birthDay;

    std::cout << "Enter birth year: ";
    std::cin >> birthYear;

    HeartRates person(firstName, lastName, birthMonth, birthDay, birthYear);

    int currentMonth, currentDay, currentYear;
    std::cout << "Enter current month (1-12): ";
    std::cin >> currentMonth;

    std::cout << "Enter current day: ";
    std::cin >> currentDay;

    std::cout << "Enter current year: ";
    std::cin >> currentYear;

    std::cout << "\nInformation:\n";
    std::cout << "Name: " << person.getFirstName() << " " << person.getLastName() << std::endl;
    std::cout << "Date of Birth: " << person.getBirthMonth() << "/" << person.getBirthDay() << "/" << person.getBirthYear() << std::endl
    std::cout << "Age: " << person.getAge(currentMonth, currentDay, currentYear) << " years" << std::endl;

    int maxHeartRate = person.getMaximumHeartRate(currentMonth, currentDay, currentYear);
    std::cout << "Maximum Heart Rate: " << maxHeartRate << " bpm" << std::endl;

    auto targetHeartRate = person.getTargetHeartRate(currentMonth, currentDay, currentYear);
    std::cout << "Target Heart Rate Range: " << targetHeartRate.first << " bpm - " << targetHeartRate.second << " bpm" << std::endl;

    return 0;
}

```

```
Enter first name: Samir
Enter last name: Khadka
Enter birth month (1-12): 11
Enter birth day: 17
Enter birth year: 2002
Enter current month (1-12): 02
Enter current day: 20
Enter current year: 2024

Information:
Name: Samir Khadka
Date of Birth: 11/17/2002
```


Hazel & Augustus' Literary Lo
Online C++ Compiler - online
Untitled document - Google D
onlinegdb.com/online_c++_compiler#
Relaunch to update
OnlineGDB beta
online compiler and debugger for c/c++
code. compile. run. debug. share.
Question 1 Assign 2
Create New Project
My Projects
Classroom new
Learn Programming
Programming Questions
Sign Up
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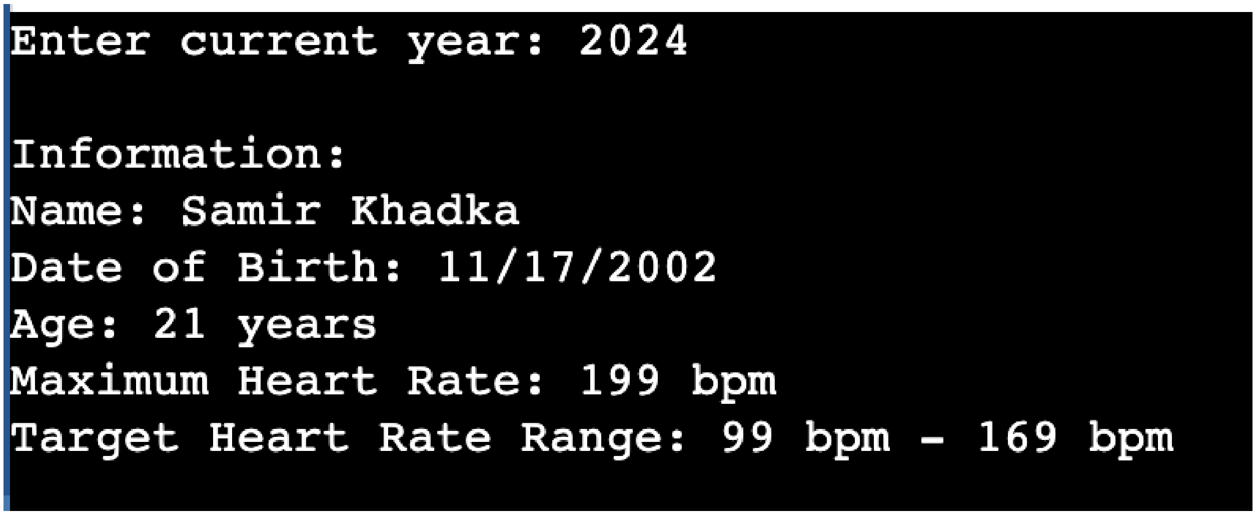
Run
Debug
Stop
Share
Save
{ } Beautify
Language C++
main.cpp
input

```cpp
    std::cin >> birthDay;

    std::cout << "Enter birth year: ";
    std::cin >> birthYear;

    HeartRates person(firstName, lastName, birthMonth, birthDay, birthYear);

    int currentMonth, currentDay, currentYear;
    std::cout << "Enter current month (1-12): ";
    std::cin >> currentMonth;

    std::cout << "Enter current day: ";
    std::cin >> currentDay;

    std::cout << "Enter current year: ";
    std::cin >> currentYear;

    std::cout << "\nInformation:\n";
    std::cout << "Name: " << person.getFirstName() << " " << person.getLastName() << std::endl;
    std::cout << "Date of Birth: " << person.getBirthMonth() << "/" << person.getBirthDay() << "/" << person.getBirthYear() << std::endl
    std::cout << "Age: " << person.getAge(currentMonth, currentDay, currentYear) << " years" << std::endl;

    int maxHeartRate = person.getMaximumHeartRate(currentMonth, currentDay, currentYear);
    std::cout << "Maximum Heart Rate: " << maxHeartRate << " bpm" << std::endl;

    auto targetHeartRate = person.getTargetHeartRate(currentMonth, currentDay, currentYear);
    std::cout << "Target Heart Rate Range: " << targetHeartRate.first << " bpm - " << targetHeartRate.second << " bpm" << std::endl;

    return 0;
}
```

```
Enter current year: 2024

Information:
Name: Samir Khadka
Date of Birth: 11/17/2002
Age: 21 years
Maximum Heart Rate: 199 bpm
Target Heart Rate Range: 99 bpm - 169 bpm


...Program finished with exit code 0
Press ENTER to exit console.
```



```
Enter current year: 2024

Information:
Name: Samir Khadka
Date of Birth: 11/17/2002
Age: 21 years
Maximum Heart Rate: 199 bpm
Target Heart Rate Range: 99 bpm - 169 bpm
```