

San Francisco Bay University

CS360 - Programming in C and C++ Homework Assignment #2

Due day: 2/27/2024

Instruction:

- 1. Push the answer sheets/source code to Github
- 2. Please follow the code style rule like programs on handout.
- 3. Overdue homework assignment submission can't be accepted.
- 4. Take academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)
- 1. Modify class *GradeBook* as follows:
 - a. Include a second-string data member that represents the course instructor's name.
 - b. Provide a set function to change the instructor's name and a get function to retrieve it.
 - c. Modify the constructor to specify course name and instructor name parameters.
 - d. Modify function *displayMessage* to output the welcome message and course name, then the *string "This course is presented by: "* followed by the instructor's name.

Use your modified class in main function that demonstrates the class's new capabilities.

```
#include <string>

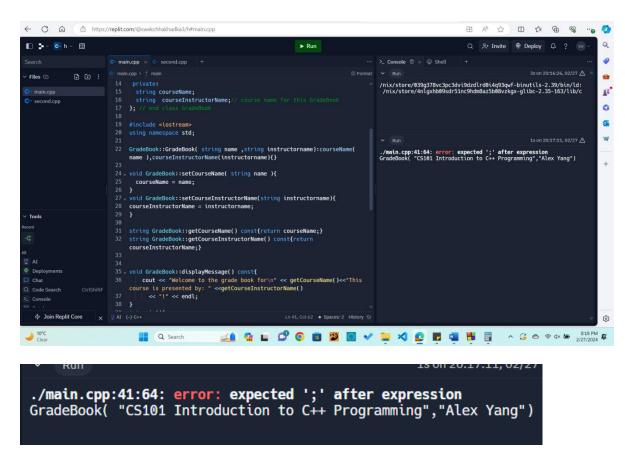
class GradeBook{
  public:
    explicit GradeBook( std::string ); // constructor initialize
  courseName
    void setCourseName( std::string ); // sets the course name
    std::string getCourseName() const; // gets the course name
    void displayMessage() const; // displays a welcome message

private:
    std::string courseName; // course name for this GradeBook
}; // end class GradeBook

#include <iostream>
    using namespace std;

GradeBook::GradeBook( string name ):courseName( name ){}
```

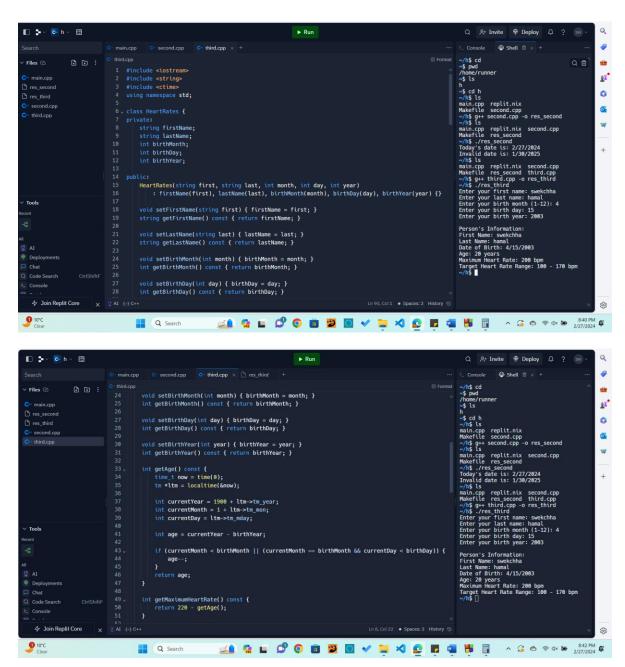
 \rightarrow

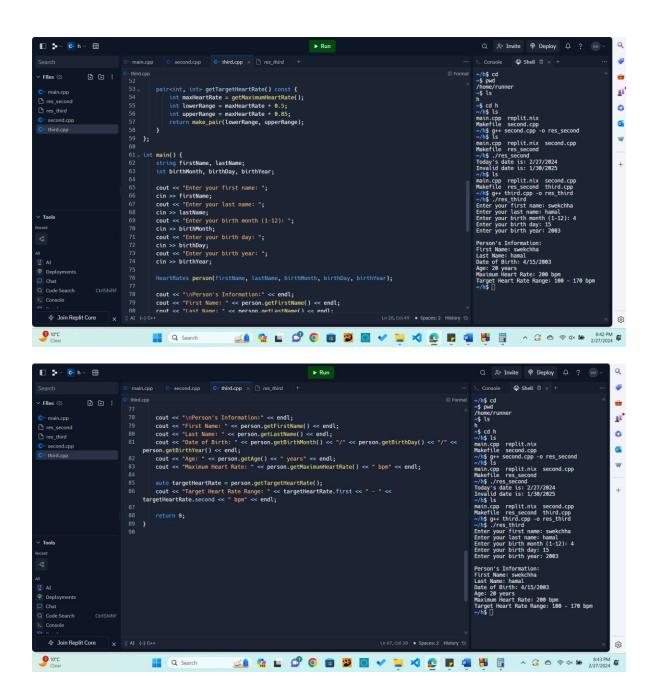


2. Create a class called *Date* that includes three pieces of information as data members--a month (type *int*), a day (type *int*) and a year (type *int*). Your class should have a constructor with three parameters that uses the parameters to initialize the three data members. Assume that the values provided for the year and day are correct but ensure that the month value is in the range *1-12*; if it isn't, set the month to *1*. Provide a *set* and a *get* function for each data member. Provide a member function *displayDate* that displays the month, day and year separated by forward slashes (/). Write a test program that demonstrates class *Date's* capabilities.

3. While exercising, you can use a heart rate monitor to see that your heart rate stays within a safe range suggested by your trainers and doctors. According to the American Heart Association (AHA) (www.americanheart.org/presenter.jhtml?identifier=4736), the formula for calculating your maximum heart rate in beats per minute is 220 minus your age in years. Your target heart rate is a range that is 50-85% of your maximum heart rate. [Note: These formulas are estimates provided by the AHA. Maximum and target heart rates may vary based on the health, fitness and gender of the individual. Always consult a physician or qualified health care professional before beginning or modifying an exercise program.]. Create a class called *HeartRates*. The class attributes should include the person's first name, last name and date of birth (consisting of separate attributes for the month, day and year of birth). Your class should have a constructor that receives this data as parameters. For each attribute provide set and get functions. The class also should include a function getAge that calculates and returns the person's age (in years), a function getMaxiumumHeartRate that calculates and returns the person's maximum heart rate and a function getTargetHeartRate that calculates and returns the person's target heart rate. Since you do not yet know how to obtain the current date from the computer, function getAge should prompt the user to enter the current month, day and year before calculating the person's age. Write an application that prompts for the person's information, instantiates an object of class *HeartRates* and prints the information from that object—including the person's first name, last name and date of birth—then calculates and prints the person's age in (years), maximum heart rate and target-heart-rate range.







Enter your first name: swekchha Enter your last name: hamal Enter your birth month (1-12): 4 Enter your birth day: 15 Enter your birth year: 2003

Person's Information: First Name: swekchha

Last Name: hamal

Date of Birth: 4/15/2003

Age: 20 years Maximum Heart Rate: 200 bpm

Target Heart Rate Range: 100 - 170 bpm

~/h\$ ∏