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CECS 282 S6 Lab 9

Part 1

#include <iostream>  
using namespace std;  
  
class time12  
{  
private:  
bool pm; //true = pm, false = am  
int hrs; //1 to 12  
int mins; //0 to 59  
public:  
 //no-arg constructor  
time12() : pm(true), hrs(0), mins(0) {}  
//3-arg constructor  
time12(bool ap, int h, int m) : pm(ap), hrs(h), mins(m)  
{ }  
void display() const //format: 11:59 p.m.  
{  
cout << hrs << ':';  
if(mins < 10)  
cout << '0'; //extra zero for "01"  
cout << mins << ' ';  
string am\_pm = pm ? "p.m." : "a.m.";  
cout << am\_pm;  
}  
};  
  
class Time24  
{  
private:  
int hours; //0 to 23  
int minutes; //0 to 59  
int seconds; //0 to 59  
public: //no-arg constructor  
operator time12();  
Time24() : hours(0), minutes(0), seconds(0)  
{ }  
Time24(int h, int m, int s) : //3-arg constructor  
hours(h), minutes(m), seconds(s)  
{ }  
void display() const //format: 23:15:01  
{  
if(hours < 10) cout << '0';  
cout << hours << ':';  
if(minutes < 10) cout << '0';  
cout << minutes << ':';  
if(seconds < 10) cout << '0';  
cout << seconds;  
}  
  
};  
  
Time24::operator time12() {  
 return time12((hours > 12), hours - 12 \* (hours > 12), minutes);  
}  
  
int main()  
{  
int h, m, s;  
  
while(true)  
{ //get 24-hr time from user  
cout << "Enter 24-hour time: \n";  
cout << " Hours (0 to 23): "; cin >> h;  
if(h > 23) //quit if hours > 23  
return(1);  
cout << " Minutes: "; cin >> m;  
cout << " Seconds: "; cin >> s;  
  
Time24 t24(h, m, s); //make a time24  
cout << "You entered: "; //display the time24  
t24.display();  
  
time12 t12 = t24; //convert time24 to time12  
  
cout << "\n12-hour time: "; //display equivalent time12  
t12.display();  
cout << "\n\n";  
}  
}

Enter 24-hour time:

Hours (0 to 23): 14

Minutes: 53

Seconds: 20

You entered: 14:53:20

12-hour time: 2:53 p.m.

Enter 24-hour time:

Hours (0 to 23): 24

Part 2:

#include <iostream>  
#include "gamma.h"  
using namespace std;  
  
int main()  
{  
 gamma g1;  
 gamma::showtotal();  
  
 gamma g2, g3;  
 gamma::showtotal();  
  
 g1.showid();  
 g2.showid();  
 g3.showid();  
 cout << "----------end of program----------\n";  
 return 0;  
}

//  
// Created by Shawn on 10/27/20.  
//  
  
#ifndef **LAB9P2\_GAMMA\_H**#define **LAB9P2\_GAMMA\_H**class gamma {  
public:  
 gamma();  
 ~gamma();  
 static void showtotal();  
 void showid() const;  
private:  
 int id;  
 static int total;  
};  
  
  
#endif //LAB9P2\_GAMMA\_H

//  
// Created by Shawn on 10/27/20.  
//  
#include <iostream>  
#include "gamma.h"  
using namespace std;  
  
int gamma::total = 0;  
  
gamma::gamma() {  
 id = total++;  
}  
  
void gamma::showtotal() {  
 cout << "Total is " << total << endl;  
}  
  
void gamma::showid() const {  
 cout << "ID number is " << id << endl;  
}  
  
gamma::~gamma() {  
 cout << "Destroying ID number " << id << endl;  
 total--;  
}

Total is 1

Total is 3

ID number is 0

ID number is 1

ID number is 2

----------end of program----------

Destroying ID number 2

Destroying ID number 1

Destroying ID number 0