Exercise 4. *Deadline: 30 March 2009.*

COURSE OF C++ PROGRAMMING LANGUAGE

TIME

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Exercise

Define a class `Time` to keep the time of a day. It should contain data members for maintaining hours, minutes and seconds.

```
class Time
{
private:
    int hour; // 0...23
    int min;  // 0...59
    int sec;  // 0...59
    // ...
};
```

When a class has a constructor, all objects of that class will be initialized. Provide to the class `Time` several constructors, and the copy–constructor too.

```
class Time
{
    // ...
public:
    Time (int h, int m=0, int s=0); // hours, minutes, seconds
    Time ();                        // current time
    Time (const Time &tm);          // copy-constructor
    // ...
};
```

Provide a set of member functions for manipulating a `Time`. For example, method `add()`, which adds the numbers of hours, minutes and/or seconds to the current time in the object. Read a state of an object `Time` using methods called *accessors*: `hours()`, `minutes()` and `seconds()`. The `Time` should be presented by special method `tostring()`.

Apart from this class, define a function `difference()`, which will calculate the difference (number of seconds) between a pair of the objects.

```
int difference (const Time &p, const Time &q);
```

Write a short program which will test objects of the class `time`.

Suggestion

Partition your code into the header and source files. Place the class `Time` into namespace `MyCalculations`.

Hint

Consider a simple program that write the current time to the standard output. It can be helpful to define a default constructor `Time()` (a default constructor is one that can be called with no arguments).

```
#include <iostream>
#include <iomanip>
#include <ctime>

using namespace std;
```

```
int main(int argc, char *argv[])
{
    time_t cz = time(0);
    tm * wsk = localtime(&cz);
    cout<<setfill('0')
        <<setw(2)<<wsk->tm_hour<<':'
        <<setw(2)<<wsk->tm_min<<':'
        <<setw(2)<<wsk->tm_sec<<endl;
}
```