



Objective:

- Focus on the purpose/use of class level information (data/operations).

Task-1:

discussed in class/lecture

```
class CMath
{
public:
    static float calcPower ( int base, int exponent );
    static int calcGCD ( int numerator, int denominator );
    static CString toCString ( long long int num );
    static long long int toInteger ( CString );
    //you may add other mathematical functions in the same way
};
```

Task-2:

There is still a possibility of creating more than one objects of the following class (discussed in lecture as well). Hunt that flaw but if you get exhausted then do discuss with me.

```
class Singleton
{
private:
    Singleton ( )
    { };
    ~Singleton ( )
    { }
    static Singleton * ptr;
public:
    static Singleton * createObject ( )
    {
        if ( ! ptr )
            ptr = new Singleton;
        return ptr;
    }
    static void freeObject ( )
    {
        if ( ptr )
        {
            delete ptr;
            ptr = nullptr;
        }
    }
};
Singleton * Singleton::ptr = nullptr;
```

Task-3:

Design a class called 'Date'. The class should store a date in three integers: month, day, and year. There should be member functions to print the date in the following forms:

Format-1: 12/25/2012

Format-2: December 25, 2012

Format-3: 25 December 2012

Demonstrate the class by writing a complete program implementing it.

Your setter functions should make sure following:

- A valid year is between 1900 and 2100
- A valid month is between 1-12
- A valid day can be between 1-31 (according to the respective month)



Make following daysInMonth array as class's private data member to easily know the number of days in each month.

```
static const int daysInMonth[ 13 ] = { 0, 31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31 };

class Date
{
private:
    int day;
    int month;
    int year;
    static const int daysInMonth[ 13 ];
    bool isLeapYear () const;
public:
    Date ( );
    Date ( int, int, int );
    void setDate ( int, int, int );
    void setDay ( int );
    void setMonth ( int );
    void setYear ( int );
    int getDay ( ) const;
    int getMonth ( ) const;
    int getYear ( ) const;
    void printFormat1 ( ) const;
    void printFormat2 ( ) const;
    void printFormat3 ( ) const;
    void incDay ( int = 1 );
    void incMonth ( int = 1 );
    void incYear ( int = 1 );
    CString getDateInFormat1 ( ) const;
    //if *this object contains day=25, month=12 and year=2012 then it returns a CString
    //object containing "12/25/2012"
    CString getDateInFormat2 ( ) const;
    CString getDateInFormat3 ( ) const;
};
```

Note:

- You are not allowed to use C++ string functions but you are free to use CString function wherever needed.
- A leap year is a year which is either divisible by 4 yet not by 100, or it is divisible by 400.