Objective:

- Focus the use of const keyword with data member and functions.
- Targets the use/purpose of class level information.

Challenge: ***Calendar Application*** (30)

I hope, you have already implemented class 'Date' in current week practice. Today, we are to develop a calendar related operation i.e. Month View of Calendar like on your computer/mobile. For this purpose, you have to implement the following class 'Calendar' and also, have to add a couple of functions in your 'Date' class.

class Calendar		Marks
{		
public:		
static bool isLeapYear (const int year);	Return true if given year is leap otherwise false.	
static CString getDayOfTheWeek (const Date &);	Return the day of week for the given Date object. For Example: For 4-Oct-2019 It returns Friday. For 12-Mar-2013 It return Tuesday.	5
static void displayCurrentMonthCalendar ();	See the sample run for this at the end of the document.	2
static void displayGivenDateCalendar(const Date &);	Same as the displayCurrentMonthCalendar method but display the month view of given Date instead of current.	8
};		

For reference I am pasting the Date class as well along with the additional functions that you got to implement.

class Date		Marks
{		
private:		
int day;		
int month;		
int year;		
static const int daysInMonth[13];		
bool isLeapYear () const;		
public:		
Date();		
Date(int d, int m, int y);		
void setDate(int,int,int);		
void setDay(int);		
void setMonth(int);		3
void setYear(int);		
int getDay() const;		
int getMonth() const;		
int getYear() const;		
void printFormat1() const;		
void printFormat2() const;		
void printFormat3() const;		
CString getDateInFormat1() const;		
CString getDateInFormat2() const;		
CString getDateInFormat3() const;		
int getTotalDaysInMonth() const;	Return the total days in the month of calling object. For Example: If Calling Object Date = 12-Jan-2019 It returns 31	2

© Fareed Ul Hassan Baig

`long long int getDaysBetweenDates(const Date &) const;`	It gives the number of days between two dates (calling object and received object Date). **Example 1:** If calling object Date: 12-07-2008 & received object Date: 29-09-2019 It returns 4097. **Example 2:** If calling object Date: 28-09-2019 & received object Date: 29-09-2019 It returns 2.	10
`};`		

Constraints/Assumptions:

- You may assume that the dates passed/used in class 'Calendar' are between the years **1971** and **2100** inclusive.
- You are not allowed to use any C/C++ library in order to find date/time related things in your code except `iostream`, `iomanip` and ctime (described below).
- ctime library can only be used to find system date as described below. No other function of ctime is allowed to use.

While implementing some function(s) given above, you might need to know/fetch the system/computer date.

But how to get current/system date/time?
ctime library will help us in this regard, which you may explore in detail at home as per your interest but for now I am pasting code which may give you required stuff for this lab at least.

```
time_t t = time(NULL);
tm curTime = * localtime(&t);
cout << curTime.tm_mday << '-' << curTime.tm_mon + 1 << '-'<<curTime.tm_year + 1900;
```

A short explanation of the stuff used above:

- `time(NULL)` returns the time since 00:00:00 UTC, January 1, 1970 in seconds.
- `time_t` is an alias of integral data type capable of holding value returned by `time(NULL)`
- `localtime` function converts the received `time_t` object into calendar time. It actually returns address of an object of type tm struct whose attributes are as follows:

Member	Type	Meaning	Range
tm_sec	int	seconds after the minute	0-61*
tm_min	int	minutes after the hour	0-59
tm_hour	int	hours since midnight	0-23
tm_mday	int	day of the month	1-31
tm_mon	int	months since January	0-11
tm_year	int	years since 1900	
tm_wday	int	days since Sunday	0-6
tm_yday	int	days since January 1	0-365
tm_isdst	int	Daylight Saving Time flag	

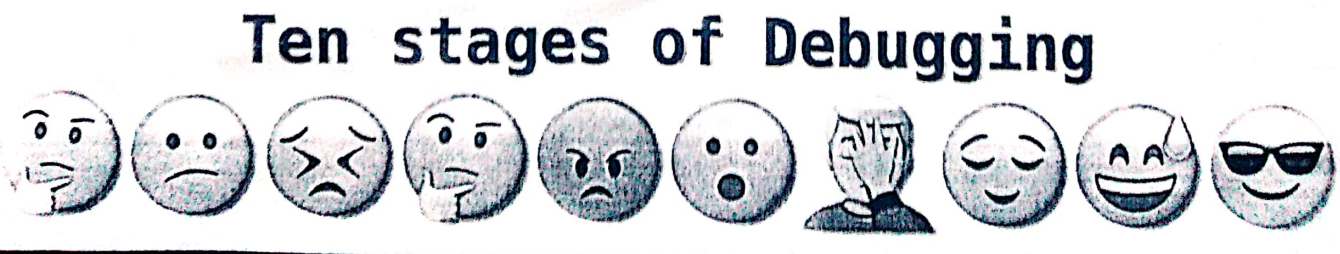
© Fareed Ul Hassan Baig

Sample Run for Calendar Month View

```
int main()
{
    Date d1(1, 1, 1971);

    cout << "01-January-1971\n";
    cout << "-------------------------------\n";

    Calendar::displayGivenDateCalendar( d1 );


    cout << "\n18-Oct-2019\n";
    cout << "-------------------------------\n";

    Calendar:: displayCurrentMonthCalendar( );

    return 0;
}
```

Console Output

```
01-January-1971
---------------------------------
  MON   TUE   WED   THU   FRI   SAT   SUN
                            1     2     3
    4     5     6     7     8     9    10
   11    12    13    14    15    16    17
   18    19    20    21    22    23    24
   25    26    27    28    29    30    31

18-Oct-2019
---------------------------------
  MON   TUE   WED   THU   FRI   SAT   SUN
          1     2     3     4     5     6
    7     8     9    10    11    12    13
   14    15    16    17    18    19    20
   21    22    23    24    25    26    27
   28    29    30    31
```



© Fareed Ul Hassan Balg