

## Assignment 5 – User-Defined Classes/Pointers

**Deadline:** Monday Nov. 25 at 11:55PM

**Type:** Group Assignment

**Weight:** This assignment is worth 4% of your final grade

### Submission instructions:

- Create the necessary files for each question
- Compress the files using zip or other tools
- Submit the zip file on Moodle
- Do not submit executable files
- All submissions must be done through Moodle

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### Exercises:

Q1. (25 marks) Write a program that takes a matrix of size  $N \times N$  of integers as input and returns:

- The largest number
- The smallest number
- The median
- The average
- The sum

Do not use C++ standard library. You must use pointers and pointer arithmetic to represent the matrix and to navigate through it.

**Deliverable:** Q1.cpp (and header files if you decide to use functions or classes)

Q2. Modify Q1 of Assignment 1 by using two pointers to integers instead of two integers. The program should behave the exact same way.

**Deliverable:** Q2.cpp (and header files for function prototype).

Q3. (25 marks) Consider the following class:

```
/* date.h */
#ifndef DATE_H_
#define DATE_H_

class Date {
public:
    Date(int=1, int=1, int=2000); // sets day, month, year
    void setDate(int, int, int); // sets the date
    void printDate() const; // prints date to the screen

private:
```

```
    int day;
    int month;
    int year;
};

#endif /* DATE_H_ */

/* date.cpp */
#include <iostream>
#include "date.h"

using namespace std;

// Constructor
Date::Date (int d, int m, int y)
{
    day = d;
    month = m;
    year = y ;
}

// sets date
void Date::setDate(int d, int m, int y)
{
    day = d;
    month = m;
    year = y ;
}

// prints date
void Date::printDate() const
{
    cout << month << "/" << day << "/" << year << "\n";
}
```

- Add a new function to the class Date that returns the month in letters (e.g., January, February, etc.).
- Add a function that prints the date using the following format: Month dd, yyyy . Example, January 23, 2019
- Test the new functions of the class Date by creating **dynamically (i.e., using pointers)** two objects of the class Date and invoking the new member functions on both objects.

**Deliverables:** date.h, date.cpp, testdate.cpp.

Q4. (25 marks) Modify Q3 of Assignment 4 by changing the date of birth of employee to a pointer of type Date of the previous question. Modify the member functions accordingly. Test your class by **dynamically** creating two Employee objects and calling on them the class member functions.

**Deliverables:** date.h, date.cpp, employee.h, employee.cpp, testemployee.cpp.