Lab 2: Structure & Pointer

- The objective of this Lab is
  - To practice of using pointer in C++
- Deadline: Monday 17th October, 2022, 11:59pm
- Submit to Moodle
  - A Report + source codes.cpp

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1. Write a C++ program to store data and perform statistical analysis for a class of 20 students. The information of each student contains ID, Name, Sex, quizzes score (20), mid-term score (40), final score (40), and total score (quiz + midterm + final). The program asks the user to choose an operation from a menu as shown below. The program keeps running never stop.

```
====================
      Menu
====================
1. Add 2 students
2. Display all student information
3. Show students who gets the max total score
4. Display a student information by ID (search by an ID)
5. Find min, max, and average scores for this class.
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Choose your option 1-5:
```

2. Write a C++ program to get a number, say n, from a user. Then modify the value of n indirectly to n+7 using a pointer variable.
   Note: We don't use: n = n + 7 (this is a direct way of modifying n)

3. Write a function to return the roots of a quadratic equation via function parameter by passing as pointer. Here is the prototype of this function:
   `void solveQuadratic(int a, int b, int c, float *x1, float *x2);`

4. Write a C++ program to ask a user for 7 integer numbers and store in an array. Then write a function that returns the min and max values of this array. The prototype of this function is `void findMinMax(int number[7], int *min, int *max);`

5. Write a C++ program to ask a user for 7 integer numbers and store in an array. Display all numbers stored in an array by using another pointer variable.

6. Write a C++ program which calculates the sum 1/1 + 1/2 + 1/3 + 1/4 + ... + 1/n, where n is a positive integer. The program contains two functions which both calculate the sum. The prototypes of these two functions are as follows:

```
void sum1(double *sum, unsigned int n);
double sum2(unsigned int n);
```

The unsigned integer number is provided in main.
Thus we apply pass by value and pass by reference.
Be careful with integer division.
Please see a sample code on the right.

```
#include<iostream>
using namespace std;

void sum1(double *sum, unsigned int n){
  //codes
}

double sum2(unsigned int n){
  //codes
}
main(){
    double result;
    sum1(&result, 5);
    result=sum2(5);
}
```