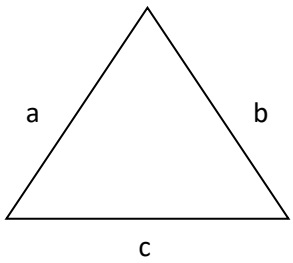
NDJ10703 – OBJECT ORIENTED PROGRAMMING.

SEMESTER 2 2022/2023

Lab Report 2 – (Functions, Array, Pointer)

1. Write an Integer function TriangleType (int a,int b,int c) that accepts as parameters the three sides of a triangle a,b and c and returns integer;

   1 → if the triangle is scalene
   2 → if the triangle is isosceles
   3 → if the triangle is equilateral
   0 → if the sides do not forma triangle



Example outputs;

Please enter Side a (cm): 5
Please enter Side b (cm): 5
Please enter side c (cm): 5
3

CODE:

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

int TriangleType(int a, int b, int c) {
   if (a <= 0 || b <= 0 || c <= 0)
      return 0;
   if (a + b > c && a + c > b && b + c > a) {
      if (a == b && b == c)
         return 3;
      else if (a == b || a == c || b == c)
         return 2;
      else
         return 1;
   }
   else
      return 0;
}

int main() {
   int a, b, c;
   cout << "Enter the sides of triangle: ";
   cin >> a >> b >> c;
   int result = TriangleType(a, b, c);
   if (result == 0)
      cout << "The sides do not form a triangle." ;
   else if (result == 1)
      cout << "The triangle is scalene.";
   else if (result == 2)
      cout << "The triangle is isosceles." ;
   else if (result == 3)
      cout << "The triangle is equilateral.";
   return 0;
}
```

2. Write a program that reads 10 integers into an array. Then print out the smallest and the largest of the entered number. Also, count total number of odd and even elements. The example output is shown below.

Enter 10 integers: 1 2 3 4 5 6 7 8 9 10
The smallest number: 1
The largest number: 10
Total even elements: 5
Total odd elements: 5

CODE:

```
#include <iostream>
#include <sstream>
using namespace std;
const int MAX_SIZE = 10;
void ArrIn (int arr[]){
   int i;
   string line;
   getline(cin, line);
   stringstream ss(line); // create a stringstream
object from the line
   for (i=0; i < MAX_SIZE; i ++){
      ss >> arr[i];
   }
}

void MaxMin (int *mx, int *mn,int arr[]){
int i = 0;
for (i=0; i < MAX_SIZE; i++){
   if (arr[0] < arr[i])
      *mx = arr[i];
}
*mn = arr[0];
for (i=0; i < MAX_SIZE; i++){
   if (arr[i]< *mn )
      *mn = arr[i];
}
}

bool OddEven (int arr){
return (arr % 2 == 0);
}
```

```
int main() {
   int arr[MAX_SIZE],mn,mx, Odd = 0 , Even = 0 ,i;

   cout << "Enter 10 integers:";
   ArrIn (arr);
   MaxMin (&mx,&mn, arr);

   for (i=0; i < MAX_SIZE; i++){
      if (OddEven(arr[i])){
         Even ++;
      }
      else{
         Odd++;
      }

   }

   cout <<"\n"<< "The smallest number: " << mn <<
endl;
   cout << "The largest number: " << mx << endl;
   cout << "Total even elements: " << Even << endl;
   cout << "Total odd elements: " << Odd << endl;

  /* print the elements of the array
   for (int j = 0; j < MAX_SIZE; j++) {
   cout << arr[j] << " ";
   }
   cout << endl;*/

  return 0;
}
```

3. Below is a C++ program.

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

int main(){

int i,j;
int *p,*q;
i = 250, j = 150, p = &i, q = &j;

cout << "i:" << i << "\t\t" << "j:" << j << endl                    //line 10
   << "pointer p: "<< *p << "\t" << "pointer q: " << *q             //line 11
   << endl << endl;

*q = 50;
*q = *p + *q;                  //line 15
*p = *p + 100;                 //line 16

cout << "updated ptr q: " << *q << "\t" << endl                     //line 18
   << "updated ptr p: " << *p << "\t" << endl;                     //line 19
return 0;
}
```

a) What is the output of line 10?
250

b) What is the output of line 11?
150

c) Will the value of *q change at line 15? Write down the output of line 18.
300

d) Will the value of *p change at line 16? Write down the output of line 19.
250