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NDJ10703 – OBJECT ORIENTED PROGRAMMING.

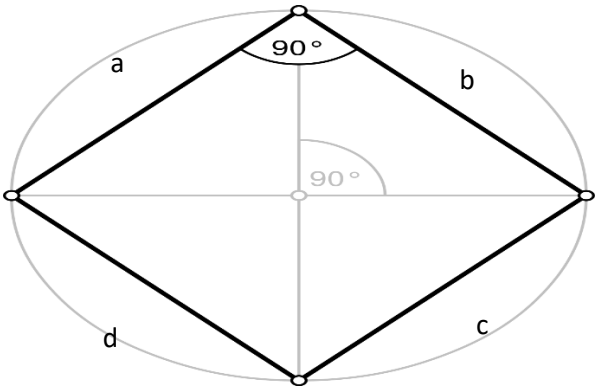
SEMESTER 2 2022/2023

Lab Report 2 – (Functions, Array, Pointer)

1. Write an Integer function PolygonType (int a,int b,int c,int d) that accepts as parameters the four sides of a polygon a,b,c and d and returns integer;

   1 → if the poligon is rectangle
   2 → if the poligon is square
   3 → if the poligon is other than rectangle or square

   0 → if the sides do not form a polygon with 4 side



Example outputs;

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

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

int SquareType(int a, int b, int c, int d) {
   if (a <= 0 || b <= 0 || c <= 0 || d <= 0) // Check if it is valid shape
      return 0;

   if (a>=1 && b >=1 && c >= 1 && d >= 1){
      if (a == b && b==c && c==d) // Square have equal sides, so the equation must find all are same length.
         return 2;
      else if (a == b || c == d) // IRectangle have 2 side with same length, so the equation must find the 2
sides are same length.
         return 1;
      else
         return 3;
   }
   else

      return 0;
}

int main() {
   int a, b, c,d;
   cout << "Enter the sides of poligon: ";
   cin >> a >> b >> c >> d;
   int result = SquareType(a, b, c,d);
   if (result == 0)
      cout << "The sides do not form a a polygon with 4 side." ;
   else if (result == 1)
      cout << "The poligon is rectangle.";
   else if (result == 2)
      cout << "The poligon is square." ;
   else if (result == 3)
      cout << "The poligon is other than square and rectangle.";
   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