

## language programing c++

Minia University  
Faculty of Computers & Information  
1<sup>st</sup> Year students

Programming Lab

Model (A)

Name: محمد مصطفى

Sec: 1

Notes: Create Your Project on (D:) &  
(YourName\_SecNo)  
\*\*\*

```
#include<iostream>
#include <cmath>
using namespace std;
int getSum(int N){
    int sum=0;
    for(int i=1 ;i<=N;i++)
        if(i%2!=0 || i==N)
            sum+=pow(i,3); //i*i*i
    return sum;
}

int main()
{
    int x;
    cout<<"Enter N represent the series level : ";
    cin>>x;
    cout<<endl<<"The Sum of this series : "<<getSum(x)<<endl;
}
```

1. [7 points] Write a complete C++ program that declare a **function** called getSum(int N) which return the sum of this series, where N represent the series level.

$$\text{SUM} = 1 + 3^3 + 5^3 + 7^3 + \dots N^3$$

2. [13 points] Write a complete C++ program that adds elements of the first row of a two-dimensional with the last column of second two-dimensional and save the adds in one-dimensional array as follows:

first		second		result
$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 4 & 6 & 9 \end{bmatrix}$	+	$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$	=	$[1 + 3, 2 + 6, 3 + 9]$

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

int main()
{
    int a[3][3], b[3][3], c[3];
    //declaration of a matrix
    for(int i=0; i<=2; i++)
        for(int j=0; j<=2; j++)
            a[i][j]=j+1+3*i;

    //declaration of b matrix
    for(int i=0; i<=2; i++)
        for(int j=0; j<=2; j++)
            b[i][j]=j+1+3*i;

    //Assignment C matrix
    for(int i=0; i<=2; i++)
    {
        c[i]=a[0][i]+b[i][2];
        cout<<c[i]<<"\t";
    }

    cout<<"\n\n"<<"Good Luck, Eng: MOHAMMED MOSTAFA" <<endl;
}
```

Answer about the following questions:

[Q1] a) What is the output of the following code segments

```
int i = 0;
bool t = true;
bool f = false;
b = (t && ((i++) == 0));
b = (f && ((i==2) > 0));
cout<<i<<endl;
```

output=1

i=1

ii. cout<<"abc\ndef"<<endl;

ii. abc  
def

iv. output:

iv. int x, y;

```
x = 5;
y = 1;
while (x > 0)
```

```
{
    x = x - 1;
    y = y * x;
    cout<<y<<endl;
}
```

4

3

2

1

```
v. int k;
double j;
k = 2;
j = 2.0;
if(k == j)
```

```
cout << "Okay:";
```

v. Okay

for(int i=1;i<=5;i++)

{ for(int j=1;j <= i;j++)

cout<<i;

cout<<endl;

b) Write a C++ Program to print the following:

```
1
22
333
4444
55555
```

[Q2] Use Switch Statement to write a C++ program to calculate Y from :

$$Y = \begin{cases} (3x-7) & \text{if } (x=-5) \\ (5x^2) & \text{if } (x=2) \text{ or } (x=5) \\ (x-4x^3) & \text{if } (x=-4) \text{ or } (x=4) \end{cases}$$

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

int main()
{
    int x,y;
    cout<<"Enter x\n";
    cin>>x;
    switch(x)
    {
        case -5:
            y=3*x-7;
            cout<<"Y= "<<y<<endl; break;
        case 2: case 5:
            y=5*pow(x,2); /*(or 5*x*x)*/
            cout<<"Y= "<<y<<endl; break;
        case -4: case 4:
            y=x-4*pow(x,3); /*(or x-4*x*x*x)*/
            cout<<"Y= "<<y<<endl; break;
    }
}
```

Good Luck

Abdelmigid Amri

Answer about the following questions:

- [Q1] a) Write a C++ program which reads unknown number of integers and counts the number of odd numbers and the count of even numbers. Assume the input integers are all positive. Use any negative number as a sentinel.  
b) Show the output for the following program part:

```
i)
int val;
for (val=-5; val<=5; val++)
{
    switch (val)
    {
        case 0:
            cout<<("EgypT");
            break;
            if (val > 0)
            cout<<("T");
            else if (val < 0)
            cout<< ("E");
    }
    cout<<"\n";
}
```

Op.ii.

1  
2  
1

```
ii)
int i = 0;
i++;
cout<<(i++)<<endl;
cout<<(i--)<<endl;
cout<<(i)<<endl;
```

Output: i.  
EEEEEEgypTTTTT

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

int main()
{
    int x=0, nEven=0, nOdd=0;
    while(x>0)
    {
        cout<<"Enter x: ";
        cin>>x;
        if(x%2 == 0 && x>0) nEven++;
        if(x%2 != 0 && x>0) nOdd++;
        cout<<endl<<"The Count of Even Numbers : "<<nEven<<endl<<
        <<"The Count of Odd Numbers : "<<nOdd<<endl;
    }
    cout<<"\n\n"<<"Good Luck, Eng. MONAALIM MOSTAFA" <<endl;
}
```

- [Q2] a) Use Switch Statement to write a C++ program to calculate Y from :

$$Y = \begin{cases} (3x-7)/f(x=-5) \\ (5x^2)/f(x=2) \text{ or } (x=5) \\ (x-4x^2)/f(x=-4) \text{ or } (x=4) \end{cases}$$

- b) Which of the following do - while statements is equivalent to : ?

x=6  
while (x < 9)

```
{
    y = x + 7;
    x ++;
}
```

a) x=6;  
x ++;  
do  
{  
y = x + 7;  
x ++;  
} while (x < 9);

d) none of the above

b) x=6;  
do  
{  
y = x + 7;  
x ++;  
} while (x < 9);

c) x=6;  
do  
{  
y = x + 7;  
x ++;  
} while (x <= 9);

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

int main()
{
    int x,y;
    cout<<"Enter x\n";
    cin>>x;
    switch(x)
    {
        case -5:
            y=3*x-7;
            cout<<"Y= "<<y<<endl; break;
        case 2: case 5:
            y=5*pow(x,2); //*(or 5*x*x)+7
            cout<<"Y= "<<y<<endl; break;
        case -4: case 4:
            y=x-4*pow(x,3); //*(or x-4*x*x*x)+7
            cout<<"Y= "<<y<<endl; break;
    }
}
```



7) The following code should print the even integers from 2 to 100:

```
counter = 2;
do {
    cout << counter << endl;
    counter += 2;
} While ( counter <= 100 );
```

[Q4] a) Choose the correct answer for each code segment: [8 points]

i. `s=1;`  
`while(s<4)`  
`++s;`  
`cout<<s;`

- (a) 1
- (b) 4
- (c) 1234
- (d) 234

ii. `for (t=0;t<3;++t)`  
`cout<<t;`

- (a) 0
- (b) 01
- (c) 012
- (d) 0123

b) State whether each of the following is true or false [7 points]

- i. a switch statement must have at least three case labels. ✗
- ii. The following two fragments of code work exactly the same way: ✓

```
switch (x > y)
{
    case true:
        cout << "X"; break;
    case false:
        cout << "Y"; break;}

```

```
if (x > y)
    cout << "X";
else
    cout << "Y";

```

The screenshot shows a C++ IDE with a file named 'Test.cpp'. The code in the editor is as follows:

```
1 #include <iostream>
2 using namespace std;
3 int main(){
4     int x=3,y=5;
5     switch(xy)
6     {
7         case true:
8             cout<<"X"<<endl;break;
9         case false:
10            cout<<"Y"<<endl;break;
11     }
12 }
13
```

A blue arrow points from the 'switch' statement in the code to the terminal output. The terminal shows the command 'PS C:\Users\NOTEBOOK\Desktop\Test101> cd "C:\Users\NOTEBOOK\Desktop\Test101"' and the output 'Y'.

Good Luck

Abdelmgid Amri



Answer about the following questions:

[Q1] a) Write a C++ program which reads unknown number of integers and counts the number of odd numbers and the count of even numbers. Assume the input integers are all positive. Use any negative number as a sentinel. [8 points]

b) Show the output for the following program part: [7 points]

i)

```
int val;  
for (val=-3; val<=3; val++)  
{ switch (val)  
  { case 0:  
    cout<<("MINIA");  
    break; }  
  if (val > 0)  
    cout<<("A");  
  else if (val < 0)  
    cout<< ("M"); }  
cout<<"\n";
```

ii)

```
int i = 2;  
i++;  
cout<<(i++)<<endl;  
cout<<(i--)<<endl;  
cout<<(i)<<endl;
```

output:

3

4

3

Output: MMMMINIAAAA

[Q2] What is the output of the following code segments: [15 points]

i.

```
int i = 0;  
bool t = true;  
bool f = false, b;  
b = (t && ((i++) == 0));  
b = (f && ((i+=2) > 0));  
cout<<i<<endl;
```

i. Output: 1

ii. cout<<"abc\ndef"<<endl;

ii. Output:  
abc  
def



```

int x, y;
x = 5;
y = 1;
while (x > 0)
{
    x = x - 1;
    y = y * x;
    cout << y << endl;
}

```

output:

4  
12  
24  
24  
0

```

int k;
double j;
k = 2;
j = 2.0;
if (k == j)
    cout << "Okay.";
else
    cout << "Not okay.";

```

output:  
Okay.

```

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

void main() {
    int a, b, c, s, area, circ;
    cout << "Enter the 3 sides of triangle: " << endl;
    cin >> a >> b >> c;
    s = (a + b + c) / 2;
    circ = 2 * s;
    area = sqrt(s * (s - a) * (s - b) * (s - c));
    cout << "The area of triangle: " << area << endl;
    cout << "The circumference of triangle: " << circ << endl;
}

```

[Q3] a- Write a program to calculate area and circumference of a triangle. Where

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}, \quad s = \frac{a+b+c}{2}$$

circumference =  $2s = a+b+c$ .

[8 points]

b) Find the error(s) in each of the following: [7 points]

(i) For ( x = 100, x >= 1, x++ )  
out << x << endl;

i. for(int x=100; x >= 1; --x)  
cout << x << endl;

i) The following code should print whether integer value is odd or even:

```

switch ( value % 2 ) {
    case 0:
        cout << "Even integer" << endl;
    case 1:
        cout << "Odd integer" << endl;
}

```

Here isn't break keyword.

) The following code should print the odd integers from 19 to 1:

```

for ( x = 19; x >= 1; x += 2 )
    cout << x << endl;

```

x -= 2



Faculty of Computers & Information

Final Exam of Programming Language I (CS142)

Grade or Level: 1<sup>st</sup> Level

Date: May, 2019

Computer Science Department  
Academic Year: 2018/2019  
Time: 3 hours

Answer the following questions:

[Q1] i. What is the output from each code segment below? (6 marks)

a. `int x = 1, y = 0;  
if (x > 0 && y < 0) {  
x = y = 23;  
cout << x << " " << y << endl;`

a.  
Op:  
1 0  
\*\*\*\*\*

b. `int x = 1, y = 0;  
if (x > 0 || y < 0) {  
x = y = 23;  
cout << x << " " << y << endl;`

b.  
Op:  
23 23  
\*\*\*\*\*

c. `x = 10; y = 40;  
if (x > 10) {  
y++;  
}  
else  
y--;  
cout << x << " " << y << endl;`

c.  
10 40

```
#include<iostream>
using namespace std;
int fact (int x)
{
    int fact=1;
    for(int i=1;i<=x;i++)
        fact*=i;
    return fact;
}

int main()
{
    int n ,m,p;
    cout << "Enter n and m\n";
    cin>>n>>m;
    p=fact(n)*fact(m+n)/fact(m+n);
    cout<<"the p value = "<<p<<endl;
}
```

ii. By using functions write a C++ program to calculate the factorial of any entrance number, and use this function in your program to calculate the P value from the relationship:

$$p = \frac{n!(m+n)!}{(m-n)!}, N! = N(N-1)(N-2).....1$$

(6 marks)

[Q2] i. Write a program to reorder a group of names alphabetically. (7 marks)

```
#include<iostream>
using namespace std;
int main()
{
    string sort[5];
    cout<<"Enter sort names\n";
    for(int i=0;i<5;i++)
        cin>>sort[i];
    for(int i=0;i<5;i++)
        for(int j=i+1;j<5;j++)
            if(sort[i]>sort[j])
                string temp=sort[i];
                sort[i]=sort[j];
                sort[j]=temp;
}

for(int i=0;i<5;i++)
    cout<<sort[i]<<"\t";
cout<<"\n";
}
```

ii. If A and B are boolean variables, then the expression  $(!A) \parallel (!B)$  is equivalent to which of the following conditions: (6marks)

a)  $(! (A \&\& B))$  b)  $(! (A \parallel B))$  c)  $(!A) \&\& (!B)$  d) true



[Q3]i. Write a C++ program which reads unknown number of integers and counts the number of odd numbers and the count of even numbers. Assume the input integers are all positive. Use any negative number as a sentinel. (7 marks)

Output:

1. 11 2. 12 3. 13  
4. 14 5. 15 6. 16  
7. 17

ii. Study the following code segment. (6 marks)

```
int N = 7; int i, x;
for (i = 1; i <= N; i++) {
    cin >> x;
    cout << i << " " << x << " ";
    if (i % 3 == 0) { cout << endl; }
    cout << endl;
}
```

- What is displayed with the given input? Watch the endl characters.

Input: 11 12 13 14 15 16 17 18 19

[Q4]i. Write a C++ program to read a one dimensional array of N values, and determine the minimum element and its location? (7 marks)

ii. What is printed in each case:  
string N = "17";  
cout << N + "10 / 4" << endl;

Output:  
1710 / 4

[Q5] i. Write a C++ program to find the value y from the relation: (7 marks)

$$y = \begin{cases} (3x-7) & \text{if } (x=-5) \\ (5x^2) & \text{if } (x=2) \text{ or } (x=5) \\ (x-4x^3) & \text{if } (x=-4) \text{ or } (x=4) \end{cases}$$

ii. What is the output of the following code segment? (6 marks)

```
int k;
double j;
k = 2;
j = 2.0;
if (k == j)
    cout << "Okay:";
else
    cout << "Not okay:";
```

Okay.  
🤔🤔

Good Luck

Prof. Abdelmgeid Amin Ali

2/2

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

int main()
{
    int arr[100], n;
    cout << "Enter N values within array:\n";
    cin >> n;
    cout << "Enter array elements please:\n";
    for (int i = 0; i < n; i++)
    {
        cout << "Enter number " << i + 1 << " : ";
        cin >> arr[i];
        cout << endl;
    }

    int min = arr[0], loc;
    for (int j = 0; j < n; j++)
    {
        if (min > arr[j])
        {
            min = arr[j];
            loc = j;
        }
    }

    cout << "The minimum element : " << min << endl;
    cout << "Its Location : " << loc + 1 << endl;
}
```