

CS & Programming Lab

Lab Manual 05

Lab Task

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Lab Task #1

/*1. Convert the following while loop to a do-while loop:*/

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int x = 1;
```

```
    do
```

```
    {cout<<"enter a number: ";
```

```
    cin>>x;}
```

```
    while (x>0);
```

```
}
```

```
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6      int x = 1;
7      do
8
9      {cout<<"enter a number: ";
10     cin>>x;}
11     while (x>0);
12 }
```

```
C:\Users\SA\Downloads\
enter a number: 1
enter a number: 1
enter a number:
```

Lab Task #2

/*2. Use a do while loop to make a simple calculator for two numbers.
Insert buttons for it to ask again and for termination.*/

```
#include <iostream>

#include <cmath>

using namespace std;

int main()
{
    //Defining Variables

    int x = 1;

    double a,b,sum;

    char symbol,again;

    //Taking number inputs
    do
    {
        cout<<endl;
```

do

```
{ cout<<"Enter any two numbers"<<endl;
```

```
cout<<endl;
```

```
    cout<<"Enter 1st number = ";
```

```
    cin>>a;
```

```
    cout<<"Enter 2nd number = ";
```

```
    cin>>b;
```

```
    cout<<endl;
```

```
    //Ask again (change numbers)
```

```
    cout<<"Do you want to change the numbers? (Y/N) = ";
```

```
    cin>>again;}
```

```
    while (again == 'Y' || again == 'y');
```

```
    cout<<endl;
```

```
    //Taking operation input
```

do

```
{ cout<<"Enter the operation symbol = ";
```

```
    cin>>symbol;
```

```
    cout<<endl;
```

```
//Ask again (change operator)

cout<<"Do you want to change the operation? (Y/N) = ";

cin>>again;}

while (again == 'Y' || again == 'y');

cout<<endl;
```

```
//Calculating and displaying results

switch (symbol)

{
```

```
//Addition

case '+':

sum = a + b;

cout<<"Addition = "<<sum<<endl;

break;
```

```
//Subtract

case '-':

sum = a - b;

cout<<"Subraction = "<<sum<<endl;

break;
```

```
//Multiplication

case '*' :

sum = a * b;

cout<<"Multipliation = "<<sum<<endl;

break;


//Division

case '/' :

sum = a / b;

cout<<"Division = "<<sum<<endl;

break;


//Remainder

case '%' :

double z = fmod( a , b) ;

cout<<"Mod = "<<z<<endl;

break;

}

cout<<endl;
```

```
//Ask again to use calculator
```

```
cout<<"Do you want to continue using this? (Y/N) = ";
```

```
cin>>again;}
```

```
while (again == 'Y' || again == 'y');
```

```
return 0;
```

```
}
```



```

1  #include <iostream>
2  #include <cmath>
3  using namespace std;
4
5  int main()
6  {
7      //Defining Variables
8      int x = 1;
9      double a,b,sum;
10     char symbol,again;
11
12     //Taking number inputs
13     do
14     {
15         cout<<endl;
16         do
17         {cout<<"Enter any two numbers"<<endl;
18             cout<<endl;
19             cout<<"Enter 1st number = ";
20             cin>>a;
21             cout<<"Enter 2nd number = ";
22             cin>>b;
23             cout<<endl;
24
25             //Ask again (change numbers)
26             cout<<"Do you want to change the numbers? (Y/N) = ";
27             cin>>again;}
28         while (again == 'Y' || again == 'y');
29         cout<<endl;
30
31         //Taking operation input
32         do
33         {cout<<"Enter the operation symbol = ";
34             cin>>symbol;
35             cout<<endl;
36
37             //Ask again (change operator)
38             cout<<"Do you want to change the operation? (Y/N) = ";
39             cin>>again;}
40         while (again == 'Y' || again == 'y');
41         cout<<endl;
42
43         //Calculating and displaying results
44         switch (symbol)
45         {
46
47             //Addition
48             case '+' :
49                 sum = a + b;
50                 cout<<"Addition = "<<sum<<endl;
51                 break;
52
53             //Subtract
54             case '-' :
55                 sum = a - b;
56                 cout<<"Subtraction = "<<sum<<endl;
57                 break;
58
59             //Multiplication
60             case '*' :
61                 sum = a * b;
62                 cout<<"Multiplication = "<<sum<<endl;
63                 break;
64
65             //Division
66             case '/' :
67                 sum = a / b;
68                 cout<<"Division = "<<sum<<endl;
69                 break;
70

```

```

71     //Remainder
72     case '%' :
73         double z = fmod( a , b ) ;
74         cout<<"Mod = "<<z<<endl;
75         break;
76     }
77     cout<<endl;
78
79     //Ask again to use calculator
80
81     cout<<"Do you want to continue using this? (Y/N) = ";
82     cin>>again;}
83     while (again == 'Y' || again == 'y');
84
85     return 0;
86 }

```

```

Enter any two numbers
Enter 1st number = 6
Enter 2nd number = 8

Do you want to change the numbers? <Y/N> = n
Enter the operation symbol = -
Do you want to change the operation? <Y/N> = n
Subtraction = -2
Do you want to continue using this? <Y/N> = y

```

```

Enter any two numbers
Enter 1st number = 6
Enter 2nd number = 8

Do you want to change the numbers? <Y/N> = n
Enter the operation symbol = +
Do you want to change the operation? <Y/N> = n
Addition = 14
Do you want to continue using this? <Y/N> = y

```

```

Enter any two numbers
Enter 1st number = 6
Enter 2nd number = 8

Do you want to change the numbers? <Y/N> = n
Enter the operation symbol = /
Do you want to change the operation? <Y/N> = n
Division = 0.75
Do you want to continue using this? <Y/N> = n

-----
Process exited after 44.16 seconds with return value 0
Press any key to continue . . .

```

Lab Task #3 (a)

/*3. Write programs with while or do while loops that compute:

a. The sum of all even numbers between 2 and 100 (inclusive).*/

```
#include <iostream>
```

```
using namespace std;
```

```
int main ()
```

```
{
```

```
    int num = 1,sum = 0;
```

```
    do
```

```
    {
```

```
        if (num % 2 == 0)
```

```
        sum = sum + num;
```

```
        num++;
```

```
    }
```

```
    while (num <= 100);
```

```
    cout<<"The sum of all even numbers between 2 and 100  
(inclusive) = "<<sum<<endl;
```

```
    return 0;
}
```

```
1  /*3. Write programs with while or do while loops that compute:
2  a. The sum of all even numbers between 2 and 100 (inclusive).*/
3
4
5  #include <iostream>
6  using namespace std;
7  int main ()
8  {
9      int num = 1, sum = 0;
10     do
11     {
12         if (num % 2 == 0)
13             sum = sum + num;
14         num++;
15     }
16     while (num <= 100);
17     cout<<"The sum of all even numbers between 2 and 100 (inclusive) = "<<sum<<endl;
18
19     return 0;
20 }
```

```
C:\Users\SA\Downloads\ME-15-Sec-A\Computer Systems and Programming\
The sum of all even numbers between 2 and 100 (inclusive) = 2550
-----
Process exited after 0.147 seconds with return value 0
Press any key to continue . . .
```

Lab Task #3 (b)

/*3. Write programs with while or do while loops that compute:

b. The sum of all squares between 1 and 100 (inclusive).*/

```
#include <iostream>
```

```
#include <cmath> //for pow()
```

```
using namespace std;
```

```
int main ()
```

```
{
```

```
    int num = 0, sum =0;
```

```
    while (num <= 10){
```

```
        sum= sum + pow( num , 2 );
```

```
        num++;}
```

```
    cout<<"The sum of all squares between 1 and 100 (inclusive) =  
"<<sum<<endl;
```

```
    return 0;
```

}

```
1  /*3. Write programs with while or do while loops that compute:
2  b. The sum of all squares between 1 and 100 (inclusive).*/
3
4
5  #include <iostream>
6  #include <cmath> //for pow()
7  using namespace std;
8  int main ()
9  {
10     int num = 0, sum =0;
11     while (num <= 10){
12
13         sum= sum + pow( num , 2 );
14         num++;}
15
16     cout<<"The sum of all squares between 1 and 100 (inclusive) = "<<sum<<endl;
17
18     return 0;
19 }
```

.

```
C:\Users\SA\Downloads\ME-15-Sec-A\Computer Systems and Program
The sum of all squares between 1 and 100 (inclusive) = 385
-----
Process exited after 0.1433 seconds with return value 0
Press any key to continue . . .
```

Lab Task #4 (a)

/*4. Write programs with while or do while loops that compute:

a. All powers of 2 from 2^0 up to 2^{20} */

```
#include <iostream>
```

```
#include <cmath>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int sum, x = 0, p = 0;
```

```
    while (x <= 20)
```

```
    {
```

```
        sum = pow ( 2 , p);
```

```
        cout<<sum<<" , ";
```

```
        p++;
```

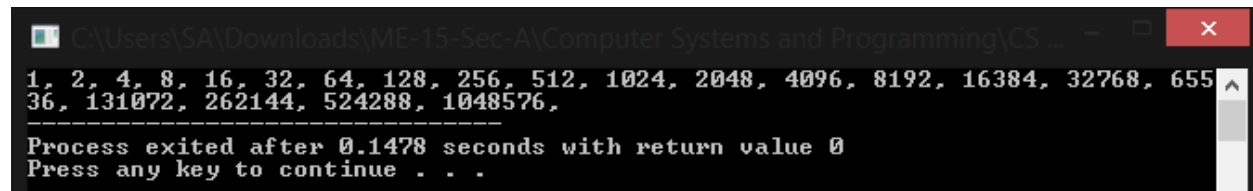
```
        x++;
```

```
    }
```

```
    return 0;
```

}

```
1  /*4. Write programs with while or do while loops that compute:
2  a. All powers of 2 from 2^0 up to 2^20*/
3
4  #include <iostream>
5  #include <cmath>
6  using namespace std;
7
8  int main()
9  {
10     int sum, x = 0, p = 0;
11     while (x <= 20)
12     {
13         sum = pow ( 2 , p);
14         cout<<sum<<" ";
15         p++;
16         x++;
17     }
18
19     return 0;
20 }
```



```
C:\Users\SA\Downloads\ME-15-Sec-A\Computer Systems and Programming\CS ...
1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 655
36, 131072, 262144, 524288, 1048576,
-----
Process exited after 0.1478 seconds with return value 0
Press any key to continue . . .
```


Lab Task #4 (b)

/*4. Write programs with while or do while loops that compute:

b. The sum of all odd numbers between a and b (inclusive), where a and b are inputs.*/

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int a,b,sum = 0;
```

```
    cout<<"Enter the range of the sum"<<endl;
```

```
    cout<<endl;
```

```
    cout<<"Enter the lower number = ";
```

```
    cin>>a;
```

```
    cout<<endl;
```

```
    cout<<"Enter the upper number = ";
```

```
    cin>>b;
```

```
    cout<<endl;
```

```
do
{
    if (a % 2 != 0)
        sum = sum + a;
    a++;
}
while (b>=a);

cout<<"The sum of all odd numbers between a and b (inclusive) =
"<<sum<<endl;

return 0;
}
```

```

1  /*4. Write programs with while or do while loops that compute:
2  b. The sum of all odd numbers between a and b (inclusive), where a and b are inputs.*/
3
4  #include <iostream>
5  using namespace std;
6
7  int main()
8  {
9      int a,b,sum = 0;
10     cout<<"Enter the range of the sum"<<endl;
11     cout<<endl;
12     cout<<"Enter the lower number = ";
13     cin>>a;
14     cout<<endl;
15     cout<<"Enter the upper number = ";
16     cin>>b;
17     cout<<endl;
18
19     do
20     {
21         if (a % 2 != 0)
22             sum = sum + a;
23         a++;
24     }
25     while (b>=a);
26
27     cout<<"The sum of all odd numbers between a and b (inclusive) = "<<sum<<endl;
28
29     return 0;
30 }

```

```

C:\Users\SA\Downloads\ME-15-Sec-A\Computer Systems and Program
Enter the range of the sum
Enter the lower number = 0
Enter the upper number = 10
The sum of all odd numbers between a and b (inclusive) = 25
-----
Process exited after 4.433 seconds with return value 0
Press any key to continue . . .

```