



CS-114 - Fundamental of Programing

Lab Tasks – 5

Course Instructor: Dr Jawad Khan

Lab Instructor: Muhammad Affan

Student Name: Ahmed Adil Hussain

CMS ID: 477537

DATE:

25 October 2023

**LAB TASK 1:**

Convert the following while loop to a do-while loop:

Code:

```
1  #include <iostream>
2
3  using namespace std;
4  int main()
5  {
6      // LAB TASK 1
7      int x = 1;
8      do{
9          cout<<"enter a number: "<<endl;
10         cin>>x;}
11     while(x>0);
12     return 0;
13 }
```

```
int x = 1;
while (x > 0)
{
    cout << "enter a number: ";
    cin >> x;
}
```

Result:

```
enter a number:
5
enter a number:
6
enter a number:
234
enter a number:
6
enter a number:
8
enter a number:
2
enter a number:
-9

-----
Process exited after 5.088 seconds with return value 0
Press any key to continue . . .
```

**LAB TASK 2:**

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

Code:

```

1  #include <iostream>
2  #include <math.h>
3
4  using namespace std;
5  int main()
6  {
7      // LAB TASK 2
8      double a;    //the first number
9      double b;    //the second number
10     int ans;
11     char choice;  //the choice of operation
12     char offon;   //the choice of turning the calculator off or on
13     do{
14         cout<<"Please enter the two numbers: "<<endl;
15         cin>>a>>b;
16         cout<<"Please choose the operation you want to conduct and enter the respective letter: "<<endl;
17         cout<<"add (a+b)= a"<<endl;
18         cout<<"sub (a-b) = s"<<endl;
19         cout<<"mult (a*b) = m"<<endl;
20         cout<<"div (a/b) = d"<<endl;
21         cout<<"power (a^b)) = p"<<endl;
22         cout<<"mod (a/b remainder) = r"<<endl;
23         cin>>choice;
24         switch(choice){
25             case 'a':
26                 cout<<"The sum of the two numbers is: "<<a+b<<endl;
27                 break;
28             case 's':
29                 cout<<"The subtraction result is: "<<a-b<<endl;
30                 break;
31             case 'm':
32                 cout<<"The product of the two numbers is: "<<a*b<<endl;
33                 break;
34             case 'd':
35                 cout<<"The quotient of the two numbers is: "<<a/b<<endl;
36                 break;
37             case 'p':
38                 cout<<"The exponential is: "<<pow(a,b)<<endl;
39                 break;
40             case 'r':
41                 cout<<"The remainder is: "<<fmod(a,b)<<endl;
42                 break;
43         }
44         cout<<"do you want to turn off the calculator, or carry out another operation? (o for off, n for on)"<<endl;
45         cin>>offon;
46         }while(offon == 'N' || offon == 'n');
47     return 0;
48 }

```

Result:

```

Please enter the two numbers:
4
72
Please choose the operation you want to conduct and enter the respective letter:
add (a+b)= a
sub (a-b) = s
mult (a*b) = m
div (a/b) = d
power (a^b)) = p
mod (a/b remainder) = r
m
The product of the two numbers is: 288
do you want to turn off the calculator, or carry out another operation? (o for off, n for on)
o

-----
Process exited after 6.267 seconds with return value 0
Press any key to continue . . .

```

**LAB TASK 3:**

Write programs with while or do while loops that compute:

- The sum of all even numbers between 2 and 100 (inclusive).
- The sum of all squares between 1 and 100 (inclusive).

Code:

```
1  #include <iostream>
2  #include <math.h>
3
4  using namespace std;
5  int main()
6  {
7      // LAB TASK 3 a
8      int esum;      //even number sum
9      int e = 0;
10     do{
11         e = e+2;
12         esum = esum + e;
13     }while(e <=98);
14     cout<<"The sum of all the even numbers from 2-100 (inclusive) is : "<<esum<<endl;
15
16     // LAB TASK 3 b
17     int sqsum;      //squares' sum
18     int sq = 0;
19     do{
20         sq = sq+1;
21         sqsum = sqsum +pow(sq,2);
22     }while(sq <=99);
23     cout<<"The sum of all the squares of the numbers from 1-100 (inclusive) is : "<<sqsum<<endl;
24
25     return 0;
26 }
```

Result:

```
The sum of all the even numbers from 2-100 (inclusive) is : 2550
The sum of all the squares of the numbers from 1-100 (inclusive) is : 338350

-----
Process exited after 0.0206 seconds with return value 0
Press any key to continue . . .
```

**LAB TASK 4:**

Write programs with while or do while loops that compute:

- All powers of 2 from 2^0 up to 2^{20} .
- The sum of all odd numbers between a and b (inclusive), where a and b are inputs.

Code:

```

1  #include <iostream>
2  #include <math.h>
3
4  using namespace std;
5  int main()
6  {
7      // LAB TASK 4 a
8      int pt;           //power of two
9      int po = -1;      //power
10     do{
11         po = po + 1;
12         pt = pow(2,po);
13         cout<<"2 ^ "<<po<<" = "<<pt<<endl;
14     }while(po <=19);
15
16
17     // LAB TASK 4 b
18     int q;             //first number
19     int r;             //second number
20     int osum;          //odd number sum
21     cout<<"Please enter the two numbers (please make sure the second number is the greatest): "<<endl;
22     cin>>q>>r;
23     int d = (q-1);
24     if(r>q){
25         do{
26             d=d+1;
27             if(d % 2 != 0){osum = osum + d;}
28         }while (d <= (r-1));
29     }
30     cout<<"the sum of the odd numbers between the two numbers(inclusive) is: "<<osum<<endl;
31     else{cout<<"Please follow the respective guideline >:("<<endl;}
32     return 0;
33 }

```

Result:

```

2 ^ 0 = 1
2 ^ 1 = 2
2 ^ 2 = 4
2 ^ 3 = 8
2 ^ 4 = 16
2 ^ 5 = 32
2 ^ 6 = 64
2 ^ 7 = 128
2 ^ 8 = 256
2 ^ 9 = 512
2 ^ 10 = 1024
2 ^ 11 = 2048
2 ^ 12 = 4096
2 ^ 13 = 8192
2 ^ 14 = 16384
2 ^ 15 = 32768
2 ^ 16 = 65536
2 ^ 17 = 131072
2 ^ 18 = 262144
2 ^ 19 = 524288
2 ^ 20 = 1048576
Please enter the two numbers (please make sure the second number is the greatest):
1
100
the sum of the odd numbers between the two numbers(inclusive) is: 2501

-----
Process exited after 2.55 seconds with return value 0
Press any key to continue . . .

```