NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF MECHANICAL AND MANUFACTURING ENGINEERING

CS-114 - Fundamental of Programing

LAB MANUAL # 5

ME -15 (C)

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

Code:

```
#include<iostream>
using namespace std;
int main(){
int x;
do{
    cout<<"Enter a number "; //gets number from user
cin>>x;                  //number will be assigned to x
}
while(x>0);              //if user puts number and it is greater than 0 then the loop will run
return 0;
}
```

Result:

```
Enter a number 7
Enter a number 9
Enter a number 5
Enter a number 8
Enter a number 100
Enter a number 0

--------------------------------
Process exited after 23.22 seconds with return value 0
Press any key to continue . . .
```

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<math.h>
using namespace std;
int main(){
    int d;
    char oper,cond;
    double x,y, R;
    do{
                        cout<<"Enter 1st numbers ";
                        cin>>x;
                        cout<<"Enter 2nd number ";
                        cin>>y;
            cout<<"Enter the operation you want to perform ";
            cin>>oper;
    switch(oper){
    case'+':
            R=x+y;
            break;
    case'-':
            R=x-y;
            break;
    case'*':
            R=x*y;
            break;
    case'/':
       R=x/y;
       break;
    case'%':
```

```
                R= fmod(x,y);
                break;
}

    cout<<R<<endl;
    cout<<"Do you want to use calculator again"<<endl;
    cin>>cond;
    }while(cond=='y');
    return 0;
}
```

Result:

```
Enter 1st numbers 23
Enter 2nd number 45
Enter the operation you want to perform +
68
Do you want to use calculator again
y
Enter 1st numbers 23
Enter 2nd number 89
Enter the operation you want to perform -
-66
Do you want to use calculator again
y
Enter 1st numbers 25
Enter 2nd number 100
Enter the operation you want to perform /
0.25
Do you want to use calculator again
y
Enter 1st numbers 90
Enter 2nd number 8
Enter the operation you want to perform *
720
Do you want to use calculator again
y
Enter 1st numbers 12
Enter 2nd number 9
Enter the operation you want to perform %
3
Do you want to use calculator again
n

--------------------------------
Process exited after 69.94 seconds with return value 0
Press any key to continue . . .
```

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

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

Code:

```
#include<iostream>
using namespace std;
int main(){
        int x,i,H;
    i=1;
    int S=0;
    while(i<=100){

        if(i%2==0){
        S=S+i;
    }
        i++;

        }
                cout<<"The sum of all even numbers between 1 and 100 = "<<S;
return 0;
}
```

Result:

```
The sum of all even numbers between 1 and 100 = 2550
--------------------------------
Process exited after 0.1041 seconds with return value 0
Press any key to continue . . .
```

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

```
#include<iostream>
using namespace std;
int main(){
        int i=1,S=0,P;
        while(i<=100){
        P=i*i;
        S=S+P;
        i++;
}
cout<<"The sum of all squares between 1 and 100 = "<<S;
return 0;

}
```

Result:

```
The sum of all squares between 1 and 100 = 338350
--------------------------------
Process exited after 0.1094 seconds with return value 0
Press any key to continue . . .
```

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<math.h>
using namespace std;
int main(){
        int i,x;
        i=2;
        x=0;
        while(x<=20){
        int Y;
        Y= pow(i,x);
        cout<<Y<<endl;
        x++;
}
return 0;
}
```

Result:

```
1
2
4
8
16
32
64
128
256
512
1024
2048
4096
8192
16384
32768
65536
131072
262144
524288
1048576

--------------------------------
Process exited after 0.1298 seconds with return value 0
Press any key to continue . . .
```

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

Code:

```
#include<iostream>
using namespace std;
int main(){
        int a,b;
        cout<<"Enter first number ";
        cin>>a;
        cout<<"Enter 2nd number ";
        cin>>b;
        int S=0;
   if(b>a){
                while(a<=b){
                if(a%2!=0){
                S=S+a;
        }
        a++;
                }
        }
        else{
                while(b<=a){
                if(b%2!=0){
                S=S+b;
        }
        b++;
                }
        }
                cout<<"The sum of all prime numbers between "<<" and "<<" = "<<S;
        return 0;
}
```

Result: