CS & Programming Lab
Lab Manual 05
Lab Task

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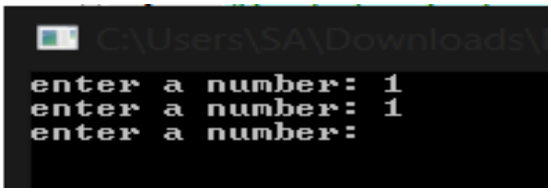
Lab Task #1

/*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);
}
```

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

int main()
{
    int x = 1;
    do

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



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;

//Subract
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;
}
```

```cpp
#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;

    //Subract
    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;

```

```
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

Subraction = -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:

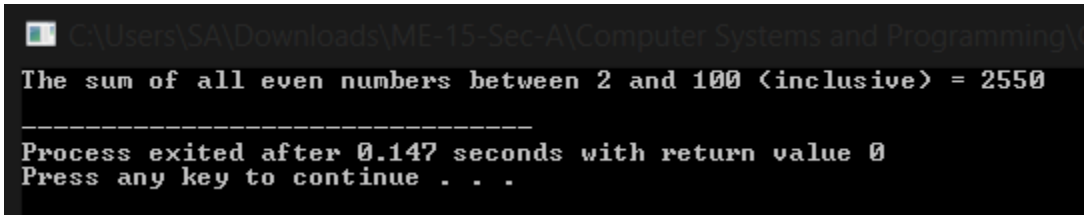
a. The sum of all even numbers between 2 and 100 (inclusive).*/

```
#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;

}

```cpp
/*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;
}
```



Lab Task #3 (b)

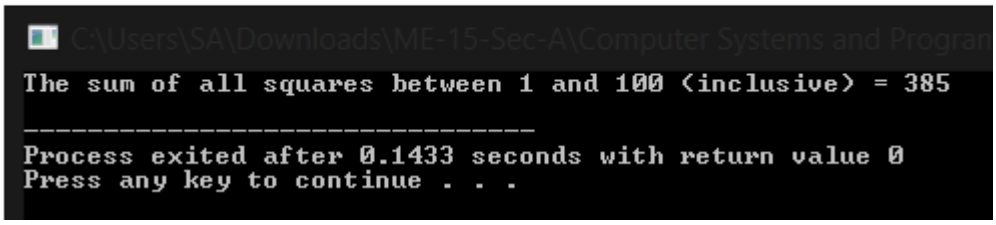
/*3. Write programs with while or do while loops that compute:

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;
```

}

```cpp
/*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;
}
```



Lab Task #4 (a)

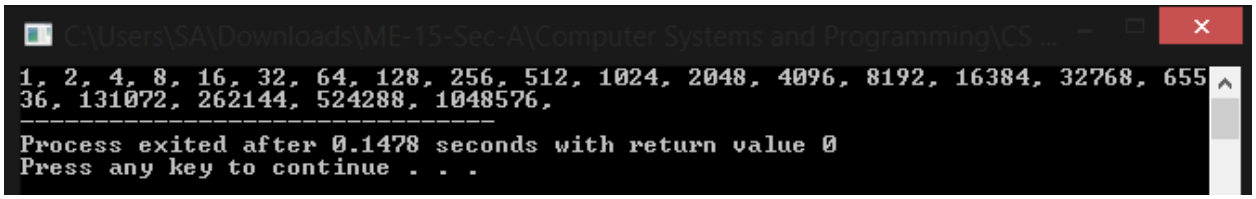
/*4. Write programs with while or do while loops that compute:

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;
```

}

```cpp
/*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;
}
```



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;
}
```

```cpp
/*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;
}
```

```
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 . . .
```