

ELEG 1043

Computer Applications in Engineering





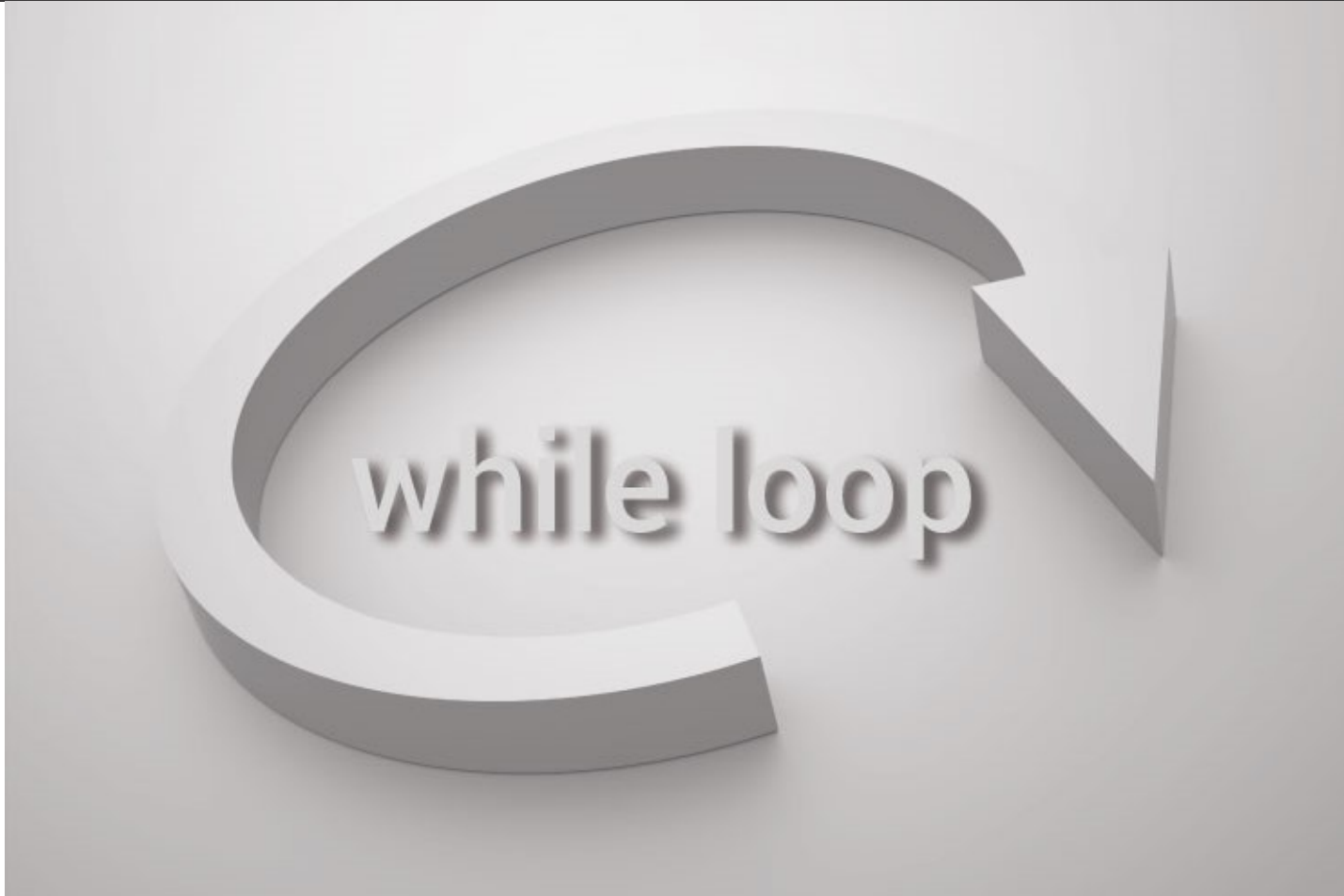
Lab Course 3

C++ FOR ENGINEERS
AND SCIENTISTS ²

Acknowledgement

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while Loops



Exercise 1

- Write a program that is to display the number from 1 to 100 with *while* loops.

Answer

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

int main()
{
    int number = 1;

    while(number < 101)
    {
        cout << number << endl;
        number = number + 1;
    }

    return 0;
}
```

Exercise 2

- Write a program that is to receive 10 numbers from the keyboard and display “You lose!” if the number is less than 0, which is implemented with *while* loops and *if* statement.

Answer

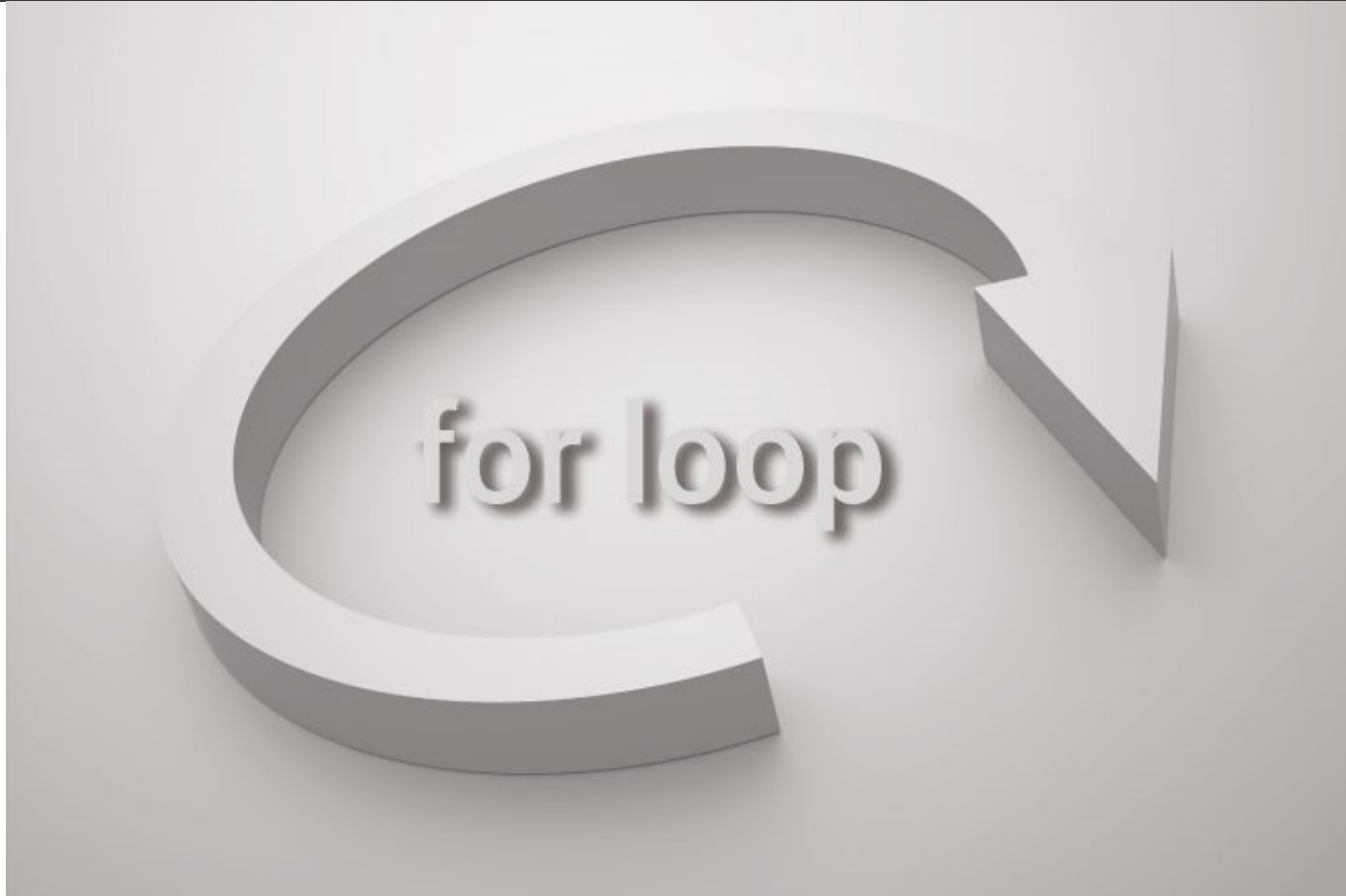
```
#include <iostream>
using namespace std;

int main()
{
    int number;
    int count = 0

    while(count < 10)
    {
        if(number < 0)
        {
            cout<<"You lose!"<<endl;
        }
        count = count + 1;
    }

    return 0;
}
```


for Loops



for Loops (continued)



Program 5.9

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

int main()
{
    const int MAXCOUNT = 5;
    int count;

    cout << "NUMBER    SQUARE ROOT\n";
    cout << "-----    -----\n";

    for (count = 1; count <= MAXCOUNT; count++)
        cout << setw(4) << count
              << setw(15) << sqrt(double(count)) << endl;

    return 0;
}
```

Exercise 3

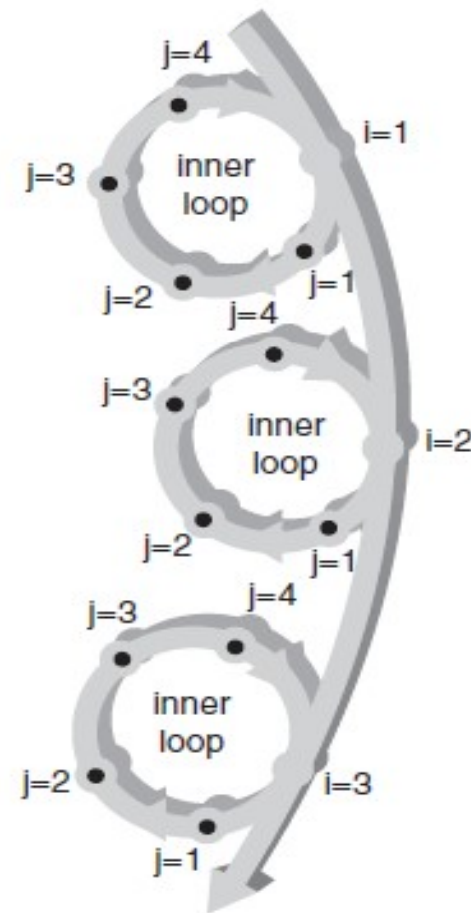
- Write a program that is to display the number from 1 to 100 with *for* loops.

Answer

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

int main()
{
    for(int i = 1; i < 11; i++)
    {
        cout<<i<<endl;
    }
    return 0;
}
```

Nested Loops



Nested Loops (continued)



Program 5.19

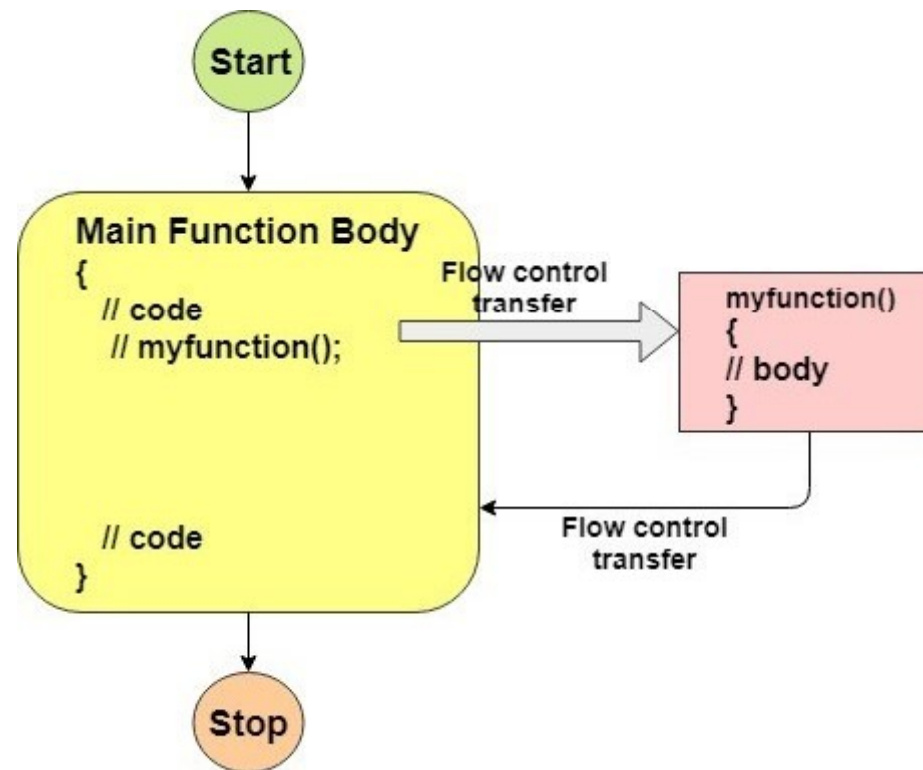
```
#include <iostream>
using namespace std;

int main()
{
    const int MAXI = 5;
    const int MAXJ = 4;
    int i, j;

    for (i = 1; i <= MAXI; i++)    // start of outer loop <----+
    {                               //                               |
        cout << "\ni is now " << i << endl;    //                               |
        //                               |
        for (j = 1; j <= MAXJ; j++) // start of inner loop      |
            cout << "  j = " << j;           // end of inner loop |
        // end of outer loop <-----+
    }
    cout << endl;

    return 0;
}
```

Function



Exercise 4

- Write a function that is to add three numbers, and call this function in **main** function.

Answer

```
#include <iostream>
using namespace std;
//Called Function
int add(int num1, int num2, int num3)
{
    int sum = num1 + num2 + num3;
    return sum;
}
//Calling Function
int main()
{
    int num1 = 1, num2 = 2, num3 = 5;
    int sum = add(num1, num2, num3);
    cout<<"the value is "<<sum<<endl;
    return 0;
}
```

Exercise 5

- Write two functions with **Function Overloading Technique**. One function is to add two integer numbers, and the other is to add two double numbers.

Answer

```
#include <iostream>
using namespace std;
int add(int num1, int num2){
    int value = num1 + num2;
    return value;
}
double add(double num1, double num2){
    double value = num1 + num2;
    return value;
}
int main(){
    int num1 = 1, num2 = 2;
    cout<<add(num1, num2);
    double dnum1 = 0.1, dnum2 = 0.3;
    cout<<add(dnum1, dnum2);
}
```

Exercise 6

- Write a function that is to swap two numbers, and call this function in **main** function.

Answer

```
#include <iostream>
using namespace std;
void swapnum(int &i, int &j) {
    int temp = i;
    i = j;
    j = temp;
}
int main(void) {
    int a = 10;
    int b = 20;
    cout<<"A is "<<a<<" and B is "<<b<<endl;
    swapnum(a, b);
    cout<<"After swapping two numbers"<<endl;
    cout<<"A is "<<a<<" and B is "<<b<<endl;
    return 0;
}
```