

C++ Repetition Program (Lecture Activities)

Group Works

Exercise 1 (10 min)

Write a program that **reads** 10 (arbitrary) integers and **prints** the smallest one, **using for loop**.

```
#include <iostream>
using namespace std;
int main( ){
    // Declare variables
    int num, sNum;

    for( int i = 1 ; i <10 ; i++){
        // Read a number
        cin>> num;
        // set sNum with the num value if it is the first entered
number
        // if not check if the num is less than the sNum
        if ( i == 1)
            sNum = num;
        else if (num < sNum)
            sNum = num;
        }
    //print sNum
    cout<<sNum;
    return 0;
}
```

Exercise 2 (5 min)

Repeat exercise 2 using While loop.

```
#include <iostream>
using namespace std;
int main( ){
    // Declare variables num holds the entered number and sNum
    holds the smallest number.
    int num, sNum, i = 1;
    // the loop reads 10 numbers and each time update the sNum with the
    smallest number.
    while(i <10){
        // Read a number
        cin>> num;
        // set sNum variable to the num value if it is the first
        entered number.

        if ( i == 1)
            sNum = num;
        // if not, check if the num is less than the sNum update
        the sNum value with num value
        else if (num < sNum)
            sNum = num;
        // increase the index i by one
        i++;
    }

    //print sNum
    cout<<sNum;
    return 0;
}
```

Exercise 3 (5 min)

Write a program that **print** the following shape **using Do..While loop**.

```
*
**
***
****
#include <iostream>
#include <string>
using namespace std;
int main( ){
    // Declare variables
    string star="*";
    do{ // print star
        cout<< star<< endl;
        // add additional star to star variable
        star+="*";
    }while(star != "*****");
    return 0;
}
```

Exercise 4 (10 min)

Write a program that **prints** the below multiplication table. Use **nested loops**.

```
  1 2 3 4 5 6
-----
1* | 1 2 3 4 5 6
2* | 2 4 6 8 10 12
3* | 3 6 9 12 15 18
4* | 4 8 12 16 20 24
5* | 5 10 15 20 25 30
6* | 6 12 18 24 30 36
```

```
#include <iostream>
using namespace std;
int main( ){
    // Declare variables
    cout<<" 1\t2\t3\t4\t5\t6\n";
    cout<<"-----\n";

    for( int row = 1 ; row<7 ; row++){
        cout<<row<<"*|";
        for( int col = 1; col<7 ; col++){
            cout<< row * col << "\t";
        }
        cout<<endl;
    }

    return 0;
}
```

Exercise 5 (15 min)

Write a program that **reads** a positive integer **n**, and **computes** and **print** the factorial of **n**.
*The factorial of a non-negative integer n , denoted by $n!$ is the product of all positive integers less than or equal to n . For example: $5! = 5 * 4 * 3 * 2 * 1 = 120$.*

Note that the program should also **print** a suitable message when **n** is negative and do not continue the computation. **Use break statement in loops.**

```
#include <iostream>
using namespace std;
int main( ){
    // Declare variables
    int n, f = 1; bool negative = false;
    cin>>n;
    do{
        if ( n <= 0){
            cout<<"The number is negative";
            negative = true;
            break;
        }
        cout<<n;
        if (n!= 1)
            cout <<"*";
        f *= n--;
    }while(n >0);
    if (!negative)
        cout<<"=" <<f;
    return 0;
}
```