



Bahria University, Islamabad
Department of Software Engineering

Computer Programming Lab
(Fall-2023)

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Enrollment : 01-131232-065

Lab Journal: x
Date: 30/10/2023

Task No:	Task Wise Marks		Documentation Marks		Total Marks (20)
	Assigned	Obtained	Assigned	Obtained	
1	3		5		
2	3				
3	3				
4	3				
5	3				

Comments:

Signature

Lab No: 5 - <Introduction to C++ Programming>

Introduction

- Taking Input from a User
- Printing or showing output in various ways

Tools Used

Visual studio

PROBLEM #1:

Print numbers in descending order.

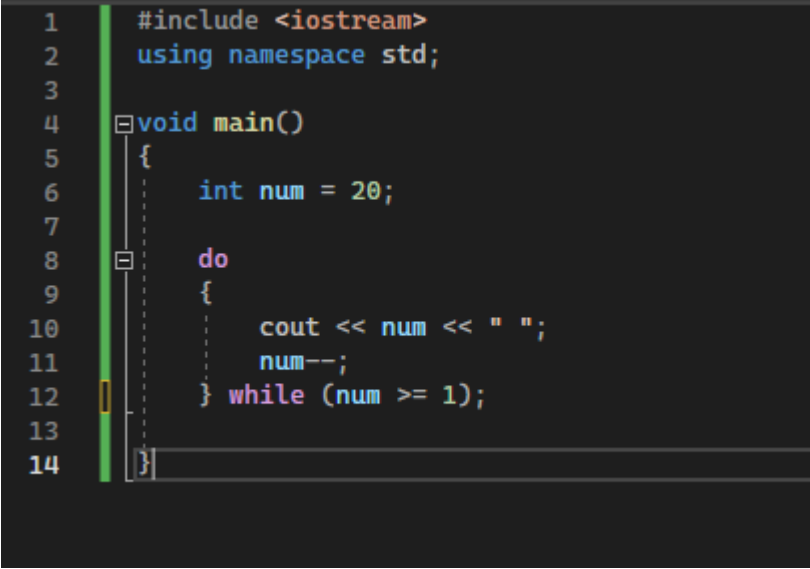
Procedure: (3 marks) Write a program to print in the descending order first twenty natural numbers on the computer screen by using “do-while” loop

PROGRAM:

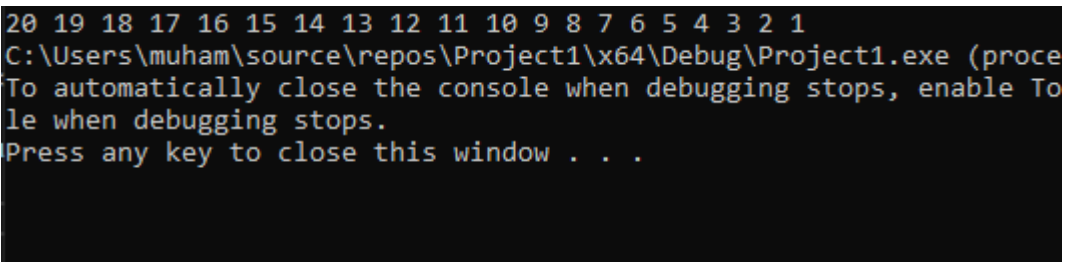
```
#include <iostream>
using namespace std;
```

```
void main()
{
    int num = 20;

    do
    {
        cout << num << " ";
        num--;
    } while (num >= 1);
}
```



```
1  #include <iostream>
2  using namespace std;
3
4  void main()
5  {
6      int num = 20;
7
8      do
9      {
10         cout << num << " ";
11         num--;
12     } while (num >= 1);
13
14 }
```



```
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe (proce
To automatically close the console when debugging stops, enable To
le when debugging stops.
Press any key to close this window . . .
```

PROBLEM #2: Program to compute factorial of the given number.

Procedure: (3 marks) Write a program to compute and print the factorial of the given number using the “do-while” loop.

PROGRAM:

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

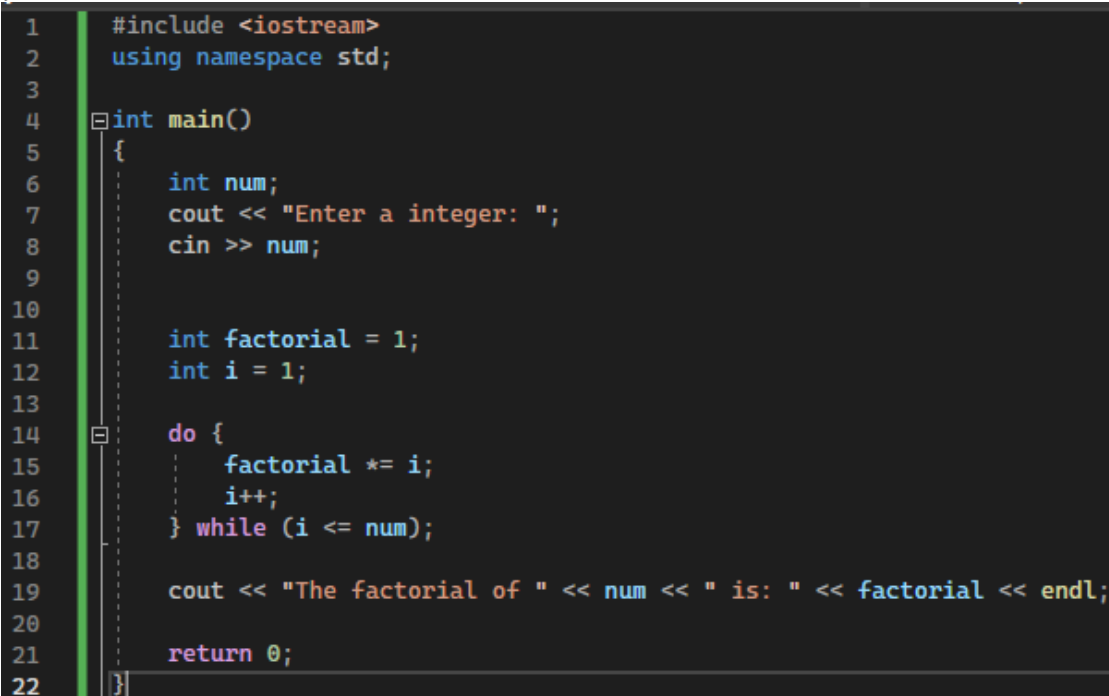
int main()
{
    int num;
    cout << "Enter a integer: ";
    cin >> num;

    int factorial = 1;
    int i = 1;

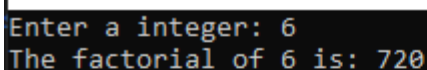
    do {
        factorial *= i;
        i++;
    } while (i <= num);

    cout << "The factorial of " << num << " is: " << factorial << endl;

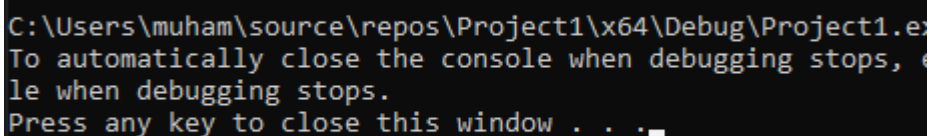
    return 0;
}
```

A screenshot of a code editor with a dark background and light-colored text. The code is a C++ program to calculate the factorial of a number using a do-while loop. The code is numbered from 1 to 22 on the left side. The code includes the necessary headers, uses the std namespace, and defines a main function. Inside the main function, it prompts the user to enter an integer, reads the input, initializes the factorial to 1 and a counter i to 1, then enters a do-while loop that multiplies the factorial by i and increments i until i is greater than the input number. Finally, it prints the result and returns 0.

```
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6      int num;
7      cout << "Enter a integer: ";
8      cin >> num;
9
10
11     int factorial = 1;
12     int i = 1;
13
14     do {
15         factorial *= i;
16         i++;
17     } while (i <= num);
18
19     cout << "The factorial of " << num << " is: " << factorial << endl;
20
21     return 0;
22 }
```

A screenshot of a console window with a black background and white text. It shows the program's output: the prompt "Enter a integer: 6" followed by the result "The factorial of 6 is: 720".

```
Enter a integer: 6
The factorial of 6 is: 720
```

A screenshot of a Windows command prompt with a black background and white text. It shows the program's execution path and debugging options: "C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe", "To automatically close the console when debugging stops, please click OK here.", and "Press any key to close this window . . .".

```
C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe
To automatically close the console when debugging stops, please click OK here.
Press any key to close this window . . .
```

PROBLEM #3: Conversion from decimal to octal number.

Procedure: (5 marks) Write a program to convert the given decimal number into octal number using the “do-while” loop.

PROGRAM:

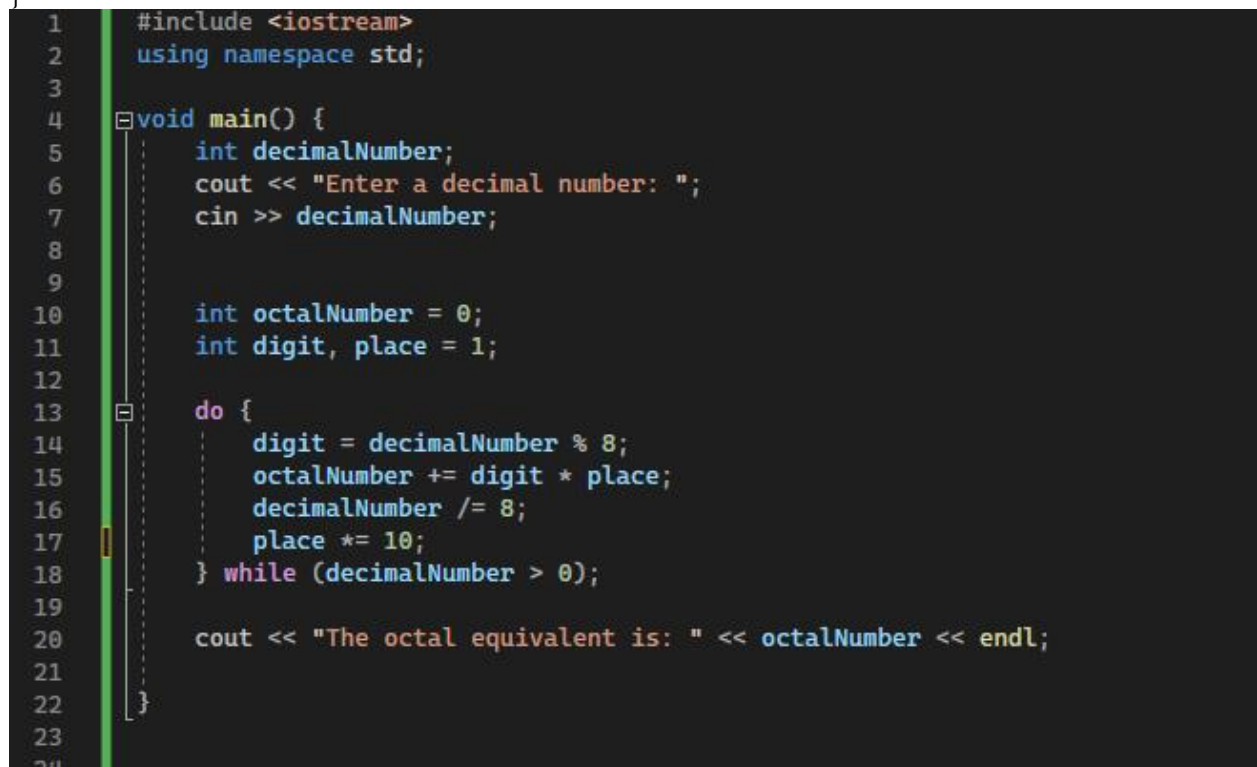
```
#include <iostream>
using namespace std;

void main() {
    int decimalNumber;
    cout << "Enter a decimal number: ";
    cin >> decimalNumber;

    int octalNumber = 0;
    int digit, place = 1;

    do {
        digit = decimalNumber % 8;
        octalNumber += digit * place;
        decimalNumber /= 8;
        place *= 10;
    } while (decimalNumber > 0);

    cout << "The octal equivalent is: " << octalNumber << endl;
}
```



```
1  #include <iostream>
2  using namespace std;
3
4  void main() {
5      int decimalNumber;
6      cout << "Enter a decimal number: ";
7      cin >> decimalNumber;
8
9
10     int octalNumber = 0;
11     int digit, place = 1;
12
13     do {
14         digit = decimalNumber % 8;
15         octalNumber += digit * place;
16         decimalNumber /= 8;
17         place *= 10;
18     } while (decimalNumber > 0);
19
20     cout << "The octal equivalent is: " << octalNumber << endl;
21
22 }
23
24
```

```
Enter a decimal number: 40
The octal equivalent is: 50

C:\Users\muham\source\repos\Project1\x64\Debug\Project1.e
To automatically close the console when debugging stops,
le when debugging stops.
Press any key to close this window . . .
```

PROBLEM #4: Four-Function Calculator.

(4 marks) Procedure: Create the equivalent of a four-function calculator.

The program should request the user to enter a number, an operator, and another number. (Use floating point.) It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. Use a switch statement to select the operation. Finally, display the result. 31 When it finishes the calculation, the program should ask if the user wants to do another calculation.

The response can be 'y' or 'n'. Some sample interaction with the program might look like this:

Enter first number, operator, and second number: 2*5 Answer = 10 Do another (y/n)? y

Enter first number, operator, and second number: 12 + 100 Answer = 112 Do another (y/n)? n

PROGRAM:

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

int main()
{
    char choice;

    do {
        float num1, num2, result;
        char operation;

        cout << "Enter first number, operator, and second number: ";
        cin >> num1 >> operation >> num2;

        switch (operation) {
            case '+':
                result = num1 + num2;
                break;
            case '-':
                result = num1 - num2;
                break;
            case '*':
                result = num1 * num2;
                break;
            case '/':
                result = num1 / num2;

                break;
            default:
```

```

        cout << "Invalid operator. Please use +, -, *, or /." << endl;
        continue;
    }

    cout << "Answer = " << result << endl;

    cout << "Do another (y/n)? ";
    cin >> choice;
} while (choice == 'y' || choice == 'Y');

return 0;
}

```

```

1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      char choice;
6
7      do {
8          float num1, num2, result;
9          char operation;
10
11          cout << "Enter first number, operator, and second number: ";
12          cin >> num1 >> operation >> num2;
13
14          switch (operation) {
15              case '+':
16                  result = num1 + num2;
17                  break;
18              case '-':
19                  result = num1 - num2;
20                  break;
21              case '*':
22                  result = num1 * num2;
23                  break;
24              case '/':
25                  result = num1 / num2;
26
27                  break;
28              default:
29                  cout << "Invalid operator. Please use +, -, *, or /." << endl;
30                  continue;
31          }
32
33          cout << "Answer = " << result << endl;
34
35          cout << "Do another (y/n)? ";
36          cin >> choice;
37      } while (choice == 'y' || choice == 'Y');
38
39      return 0;
40 }

```

```

Enter first number, operator, and second number: 2+5
Answer = 7
Do another (y/n)? y
Enter first number, operator, and second number: 3*3
Answer = 9
Do another (y/n)? n

```

```

C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe (process 2073)
To automatically close the console when debugging stops, enable Tools->Options->
Enable when debugging stops.
Press any key to close this window . . .

```

EXTRA TAKS:

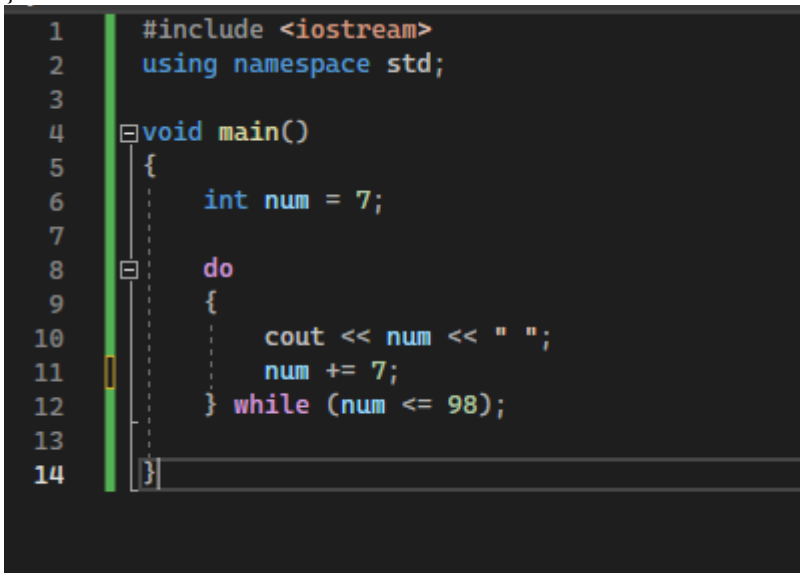
Task 1: It is necessary for the program to display the following sequence of numbers:
7 14 21 28 35 42 49 56 63 70 77 84 91 98

PROGRAM:

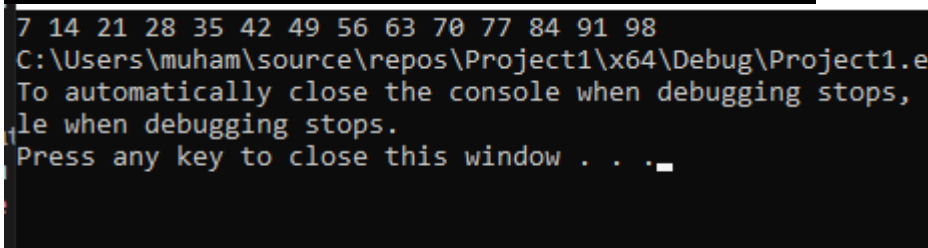
```
#include <iostream>
using namespace std;

void main()
{
    int num = 7;

    do
    {
        cout << num << " ";
        num += 7;
    } while (num <= 98);
}
```

A screenshot of a code editor with a dark background. The code is written in C++ and is color-coded. Line numbers 1 through 14 are visible on the left. The code includes the iostream header, uses the std namespace, and defines a main function. Inside main, an integer num is initialized to 7. A do-while loop prints the value of num followed by a space, then increments num by 7, and continues until num is greater than 98. The code is as follows:

```
1  #include <iostream>
2  using namespace std;
3
4  void main()
5  {
6      int num = 7;
7
8      do
9      {
10         cout << num << " ";
11         num += 7;
12     } while (num <= 98);
13
14 }
```

A screenshot of a console window with a black background and white text. The first line shows the output of the program: "7 14 21 28 35 42 49 56 63 70 77 84 91 98". The second line shows the file path: "C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe". The third line is a message: "To automatically close the console when debugging stops, e". The fourth line is a prompt: "Press any key to close this window . . .".

```
7 14 21 28 35 42 49 56 63 70 77 84 91 98
C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe
To automatically close the console when debugging stops, e
Press any key to close this window . . .
```

Task 2: It is necessary to display the following sequence of numbers:
1 2 4 8 16 32 64 128 256 512

PROGRAM:

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

void main()
{
    int num = 1;

    do
    {
```

```
    cout << num << " ";  
    num *= 2;  
} while (num <= 512);  
}
```

```
1  #include <iostream>  
2  using namespace std;  
3  
4  void main()  
5  {  
6      int num = 1;  
7  
8      do  
9      {  
10         cout << num << " ";  
11         num *= 2;  
12     } while (num <= 512);  
13  
14 }
```

1 2 4 8 16 32 64 128 256 512

C:\Users\muham\source\repos\Project1\x64\Debug\Project1.exe (process 4880)

To automatically close the console when debugging stops, enable Tools->Options->Automatically close the console when debugging stops.

Press any key to close this window . . .

