



Bahria University, Islamabad
Department of Software Engineering

Computer Programming Lab
(Fall-2023)

Teacher: Engr. M Waleed Khan

Student : Muhammad Abbas Bangash

Enrollment : 01-131232-047

Lab Journal: 5

Date: 1/11/2023

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: 2

Introduction

Do-while loops.

Tools Used

Online GDB, C++.

Task 1: Write a program to print in the descending order first twenty natural numbers on the computer screen by using “do-while” loop.

Code:

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int num=20;
```

```
    cout<<"The first 20 natural numbers in descending order are:"<<endl;
```

```
    do
```

```
    {
```

```
        cout<<num--<<endl;
```

```
    }
```

```
    while(num>=1);
```

```
    return 0;
```

```
}
```

Screenshot:

```
4 GDB online is an online compiler and debugger tool for C, C++, Python, Java, PHP, Ruby, Perl,
5 C#, OCaml, VB, Swift, Pascal, Fortran, Haskell, Objective-C, Assembly, HTML, CSS, JS, SQLite, Prolog.
6 Code, Compile, Run and Debug online from anywhere in world.
7
8 *****/
9 #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int num=20;
16     cout<<"The first 20 natural numbers in descending order are:"<<endl;
17     do
18     {
19         cout<<num--<<endl;
20     }
21     while(num>=1);
22
23     return 0;
24 }
```

input

```
The first 20 natural numbers in descending order are:
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

...Program finished with exit code 0
Press ENTER to exit console.
```

Task 2: Write a program to compute and print the factorial of the given number using the “do-while” loop.

Code:

```
int main()
{
    int num,factorial=1,i=1;
```

```
cout<<"Enter a number:"<<endl;

cin>>num;

if(num<0)
{
    cout<<"Factorial can't be calculated for a negative number.";
}

else
{

do{
    factorial=factorial*i;
    i++;
}

while(i<=num);

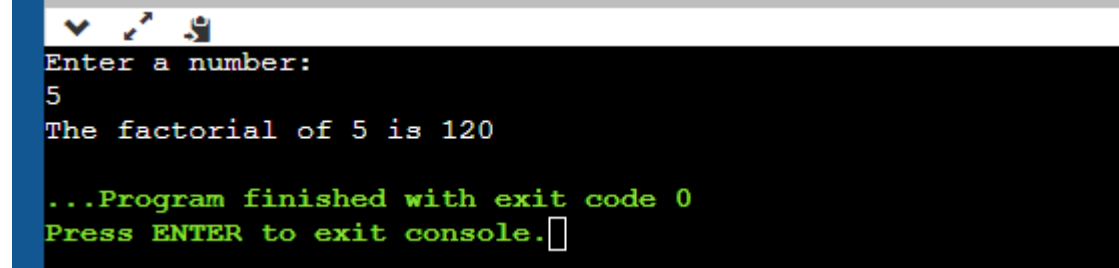
cout<<"The factorial of "<<num<<" is "<<factorial;

}

return 0;
}
```

Screenshot:

```
10 using namespace std;
11
12 int main()
13 {
14     int num,factorial=1,i=1;
15
16     cout<<"Enter a number:"<<endl;
17     cin>>num;
18
19     if(num<0)
20     {
21         cout<<"Factorial can't be calculated for a negative number.";
22     }
23
24     else
25     {
26
27         do{
28             factorial=factorial*i;
29             i++;
30         }
31
32         while(i<=num);
33
34         cout<<"The factorial of "<<num<<" is "<<factorial;
35     }
36
37     return 0;
38 }
39
```



Task#3: Write a program to convert the given decimal number into octal number using the “do-while” loop.

Code:

```
#include<iostream>
```

```
using namespace std;
```

```
int main() {
```

```
int decimalnum, remainder;

int octalnum[32];

int n= 0;


cout << "Enter a decimal number: ";
cin >> decimalnum;


if (decimalnum < 0)
{
    cout << "Please enter a non-negative number." << endl;
} else {
    do {
        remainder = decimalnum % 8;
        octalnum[n] = remainder;
        n++;
        decimalnum /= 8;
    } while (decimalnum != 0);

    cout << "The octal equivalent is: ";

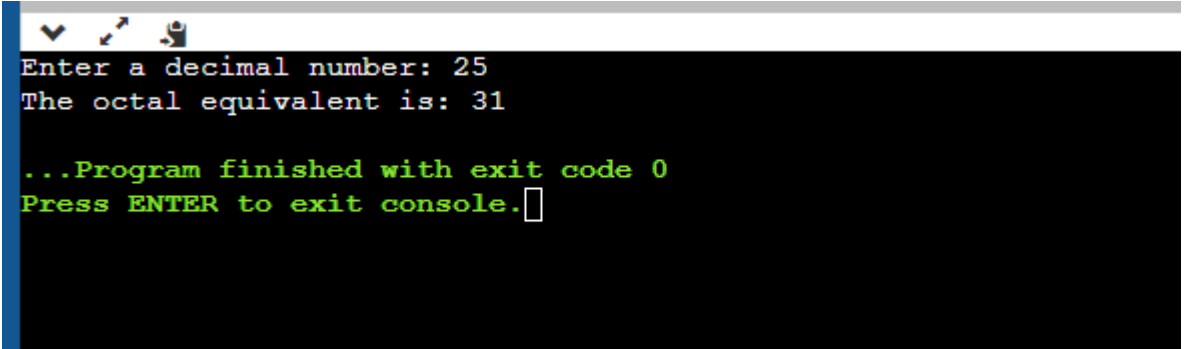
    for (int i = n- 1; i >= 0; i--)
    {
        cout << octalnum[i];
    }

}

return 0;
}
```

Screenshot:

```
8  *****/
9  #include<iostream>
10 using namespace std;
11
12 int main() {
13     int decimalnum, remainder;
14     int octalnum[32];
15     int n= 0;
16
17     cout << "Enter a decimal number: ";
18     cin >> decimalnum;
19
20     if (decimalnum < 0)
21     {
22         cout << "Please enter a non-negative number." << endl;
23     } else {
24         do {
25             remainder = decimalnum % 8;
26             octalnum[n] = remainder;
27             n++;
28             decimalnum /= 8;
29         } while (decimalnum != 0);
30
31         cout << "The octal equivalent is: ";
32
33         for (int i = n- 1; i >= 0; i--)
34         {
35             cout << octalnum[i];
36         }
37
38     }
39
40 }
41
42 return 0;
43 }
44
```



```
Enter a decimal number: 25
The octal equivalent is: 31

...Program finished with exit code 0
Press ENTER to exit console.
```

Task#4: Create the equivalent of a four-function calculator.

Code:

```
#include <iostream>
```

```
using namespace std;

int main() {

    char choice;
    char again;

    do {
        double num1, num2, result;

        cout << "Enter the first number: ";
        cin >> num1;

        cout << "Enter the second number: ";
        cin >> num2;

        cout << "Choose an operation (+, -, *, /): ";
        cin >> choice;

        switch (choice) {
            case '+':
                result = num1 + num2;
                break;
            case '-':
                result = num1 - num2;
                break;
            case '*':
                result = num1 * num2;
                break;
            case '/':
                if (num2 != 0)
```



```
{
    result = num1 / num2;
}
else {
    cout << "Division by zero is not allowed." << endl;
    continue;
}
break;
default:
    cout << "Invalid operation." << endl;
    continue;
}

cout << "Result: " << num1 << " " << choice << " " << num2 << " = " << result << endl;

cout << "use calculator again? (y/n): ";
cin >> again;

}
while (again == 'y' || again == 'Y');

cout << "Calculator program ended" << endl;

return 0;
}
```

Screenshot:

```
8  *****/
9  #include <iostream>
10 using namespace std;
11
12 int main() {
13
14     char choice;
15     char again;
16
17     do {
18         double num1, num2, result;
19
20         cout << "Enter the first number: ";
21         cin >> num1;
22
23         cout << "Enter the second number: ";
24         cin >> num2;
25
26         cout << "Choose an operation (+, -, *, /): ";
27         cin >> choice;
28
29         switch (choice) {
30             case '+':
31                 result = num1 + num2;
32                 break;
33             case '-':
34                 result = num1 - num2;
35                 break;
36             case '*':
37                 result = num1 * num2;
38                 break;
39             case '/':
40                 if (num2 != 0)
41                 {
42                     result = num1 / num2;
43                 }
44                 else {
45                     cout << "Division by zero is not allowed." << endl;
46                     continue;
47                 }
48                 break;
49             default:
50                 cout << "Invalid operation " << endl;
51
52                 {
53                     result = num1 / num2;
54                 }
55                 else {
56                     cout << "Division by zero is not allowed." << endl;
57                     continue;
58                 }
59                 break;
60             default:
61                 cout << "Invalid operation." << endl;
62                 continue;
63         }
64
65         cout << "Result: " << num1 << " " << choice << " " << num2 << " = " << result << endl;
66
67         cout << "use calculator again? (y/n): ";
68         cin >> again;
69     }
70     while (again == 'y' || again == 'Y');
71
72     cout << "Calculator program ended" << endl;
73
74     return 0;
75 }
```

input

```
Enter the first number: 2
Enter the second number: 4
Choose an operation (+, -, *, /): +
Result: 2 + 4 = 6
use calculator again? (y/n): n
Calculator program ended

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Enter the first number: 2
Enter the second number: 5
Choose an operation (+, -, *, /): +
Result: 2 + 5 = 7
use calculator again? (y/n): y
Enter the first number: 2
Enter the second number: 6
Choose an operation (+, -, *, /): +
Result: 2 + 6 = 8
use calculator again? (y/n): n
Calculator program ended

...Program finished with exit code 0
Press ENTER to exit console.
```

Extra tasks:

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.

Code:

```
#include <iostream>

using namespace std;
```

```
int main() {

    int num = 7;

    do {

        cout << num << " ";

        num += 7;

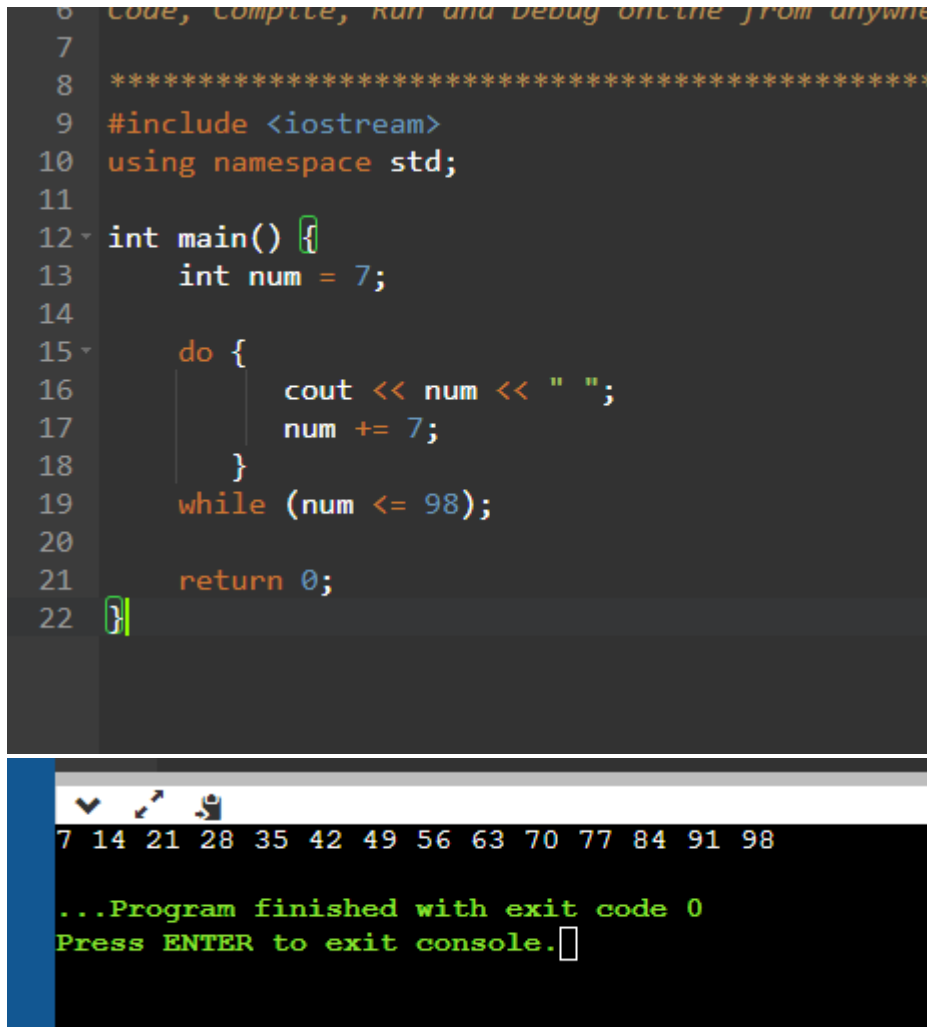
    }

    while (num <= 98);

    return 0;

}
```

Screenshot:



The screenshot shows a C++ program in a code editor. The code is as follows:

```
6 Code, Compile, Run and Debug on the fly from anywhere
7
8 *****
9 #include <iostream>
10 using namespace std;
11
12 int main() {
13     int num = 7;
14
15     do {
16         cout << num << " ";
17         num += 7;
18     }
19     while (num <= 98);
20
21     return 0;
22 }
```

Below the code editor, the terminal output is shown:

```
7 14 21 28 35 42 49 56 63 70 77 84 91 98
...Program finished with exit code 0
Press ENTER to exit console.
```

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

Code:

```
#include <iostream>

using namespace std;

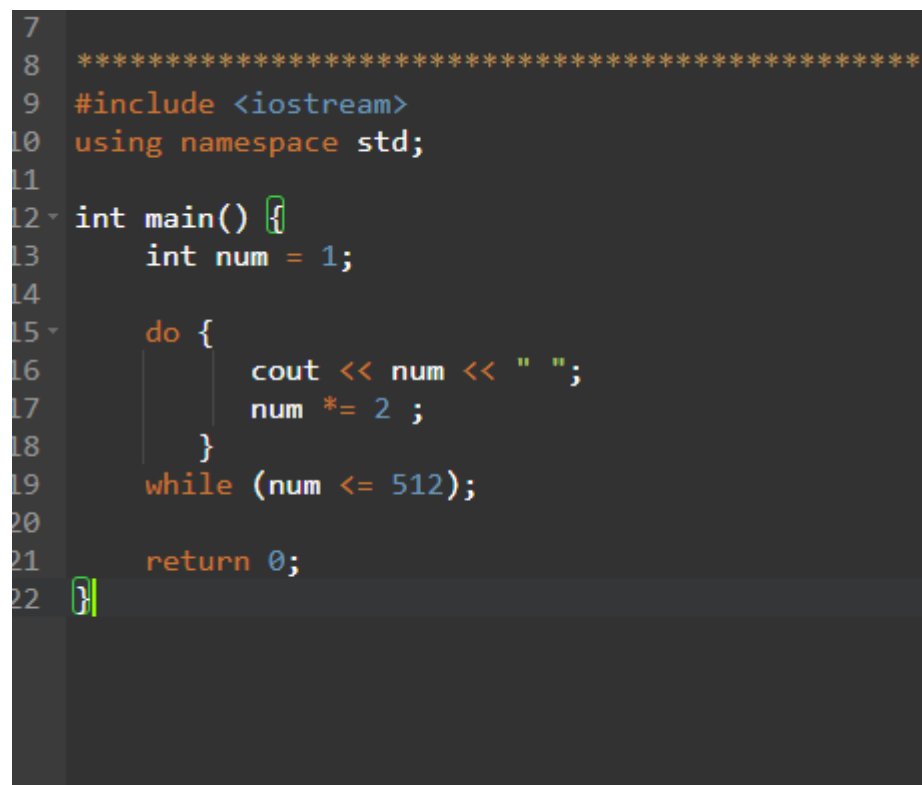
int main() {

    int num = 1;

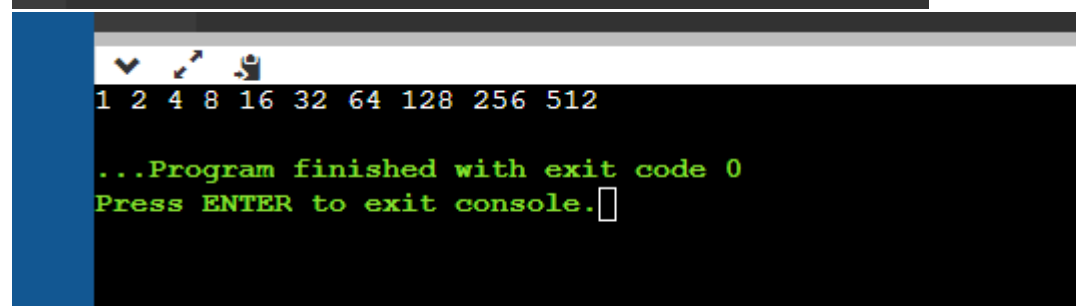
    do {
```

```
        cout << num << " ";  
  
        num *= 2 ;  
    }  
while (num <= 512);  
  
return 0;  
}
```

Screenshot:



```
7  
8 *****  
9 #include <iostream>  
10 using namespace std;  
11  
12 int main() {  
13     int num = 1;  
14  
15     do {  
16         cout << num << " ";  
17         num *= 2 ;  
18     }  
19     while (num <= 512);  
20  
21     return 0;  
22 }
```



```
1 2 4 8 16 32 64 128 256 512  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

Conclusion:

All the tasks were completed successfully.

Lab Journal Instructions:

- This is the template file you need to follow for your Lab Journals
- The cover page is mandatory for every lab journal
- Fill the details accordingly don't change any details regarding the university, department, course, or teacher.
- Fill your name and enrollment number accordingly
- Kindly provide the date on which the lab was held
- Lab Journal: followed by the number of lab and in case of open-ended add "Open-Ended" if it doesn't fit reduce the font size a bit.
- Add or remove the rows in the evaluation table based on the number of tasks assigned in the lab also fill the task number column.
- You are not supposed to fill the evaluation columns in the evaluations table apart from the task numbers. The same instruction is applicable for the comments section.
- These instructions are for your reference only no need to add them to the actual document.
- Update the page headers accordingly.
- Lab journal headings are provided above.
- Kindly follow the heading titles and styles set in the template and use justified text for paragraphs.
- In case the code is too long only add the key logic snippets and make sure your screenshots are clearly visible and readable.