Bahria University, Islamabad

Department of Software Engineering

Computer Programming Lab

(Fall-2023)

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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

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:

```
GDB online is an online compiler and debugger tool for C, C++, Python, Java, PHP, Ruby, Perl,
C#, OCaml, VB, Swift, Pascal, Fortran, Haskell, Objective-C, Assembly, HTML, CSS, JS, SQLite, Prolog.
Code, Compile, Run and Debug online from anywhere in world.

*******************************************************************************/
#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;
}
```

```
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:

```
using namespace std;

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;
}
```

```
Enter a number:
5
The factorial of 5 is 120

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

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
34          for (int i = n- 1; i >= 0; i--)
35          {
36              cout << octalnum[i];
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)
```

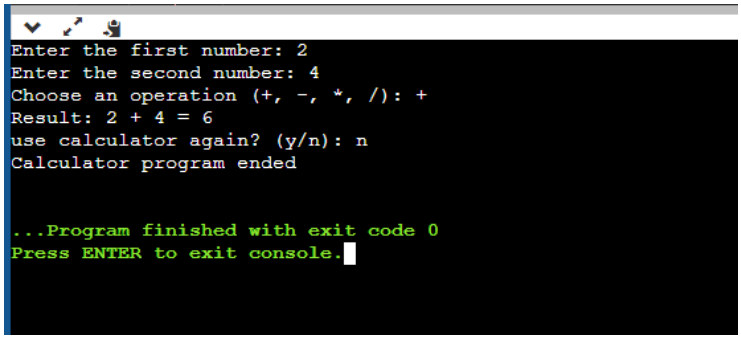
```
            {
               result = num1 / num2;
            }
            else {
                 cout << "Division by zero is not allowed." << endl;
                  continue;
                }
            break;
          default:
            cout << "Invalid operation." << endl;
         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

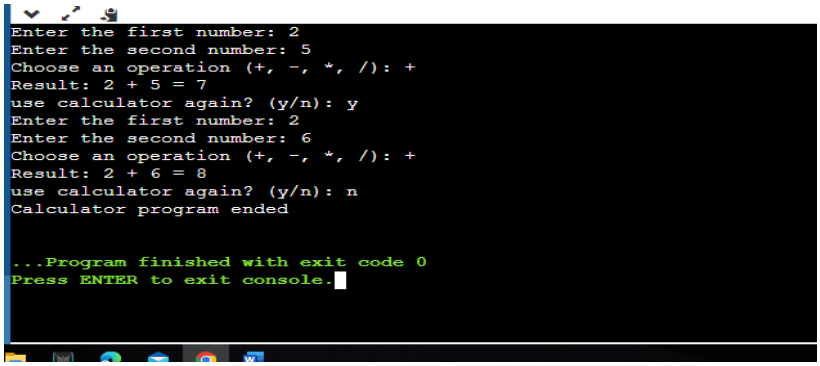
Screenshot:

```
*************************************************************************/
#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;
```

```
            {
                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;
```

input





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:

```
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 }
```

```
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

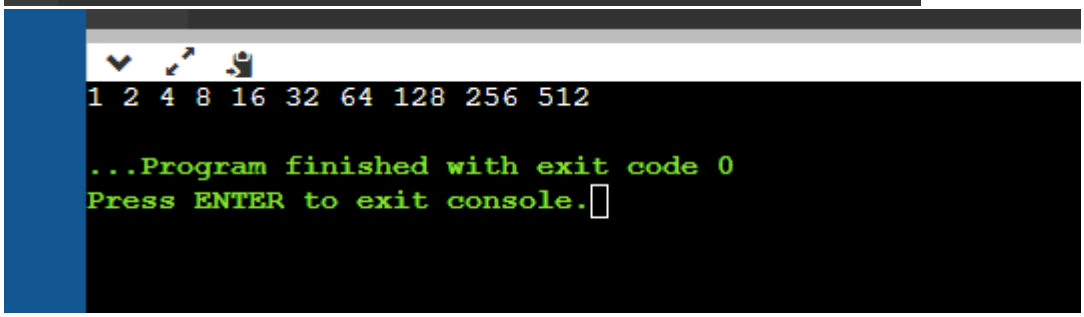
Code:

```
#include <iostream>

using namespace std;


int main() {

   int num = 1;


   do {
```

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

   return 0;
}
```

Screenshot:

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

int main() {
    int num = 1;

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

    return 0;
}
```



```
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 incase of open-ended add "Open-Ended" if it doesn't fits 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 used 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.