

Bangladesh Army International University of Science & Technology



Department of Computer Science & Engineering (CSE) Lab Report

Course Code : CSE-214

Course Title : Object Oriented Programming Sessional

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Submitted To:

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Level-Term : 2-1

Section : A

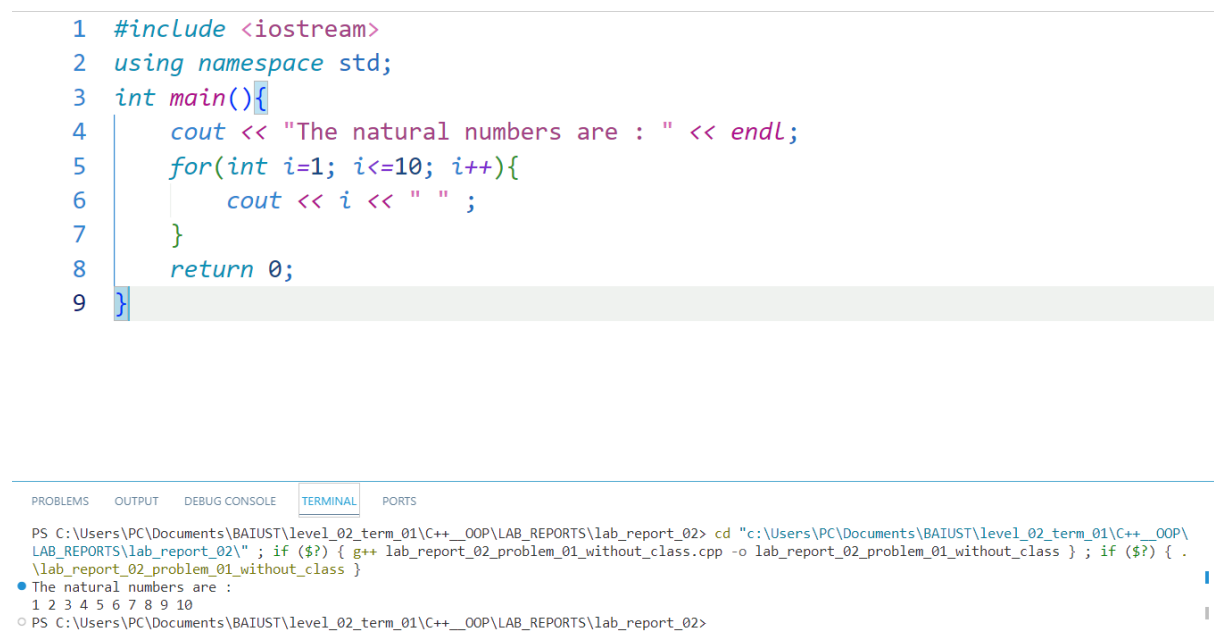
Department : CSE

Problem_01_without_class

Code:

```
#include <iostream>
using namespace std;
int main(){
    cout << "The natural numbers are : " << endl;
    for(int i=1; i<=10; i++){
        cout << i << " " ;
    }
    return 0;
}
```

Screenshot :



The screenshot displays a C++ IDE with two main panels. The top panel shows the source code for 'Problem_01_without_class.cpp', which includes the necessary headers, namespace, and a main function that prints the natural numbers from 1 to 10. The bottom panel shows the terminal output, which includes the command to compile and run the program, followed by the execution output: 'The natural numbers are : 1 2 3 4 5 6 7 8 9 10'.

```
1 #include <iostream>
2 using namespace std;
3 int main(){
4     cout << "The natural numbers are : " << endl;
5     for(int i=1; i<=10; i++){
6         cout << i << " " ;
7     }
8     return 0;
9 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_01_without_class.cpp -o lab_report_02_problem_01_without_class } ; if (\$?) { .\lab_report_02_problem_01_without_class }

● The natural numbers are :
1 2 3 4 5 6 7 8 9 10

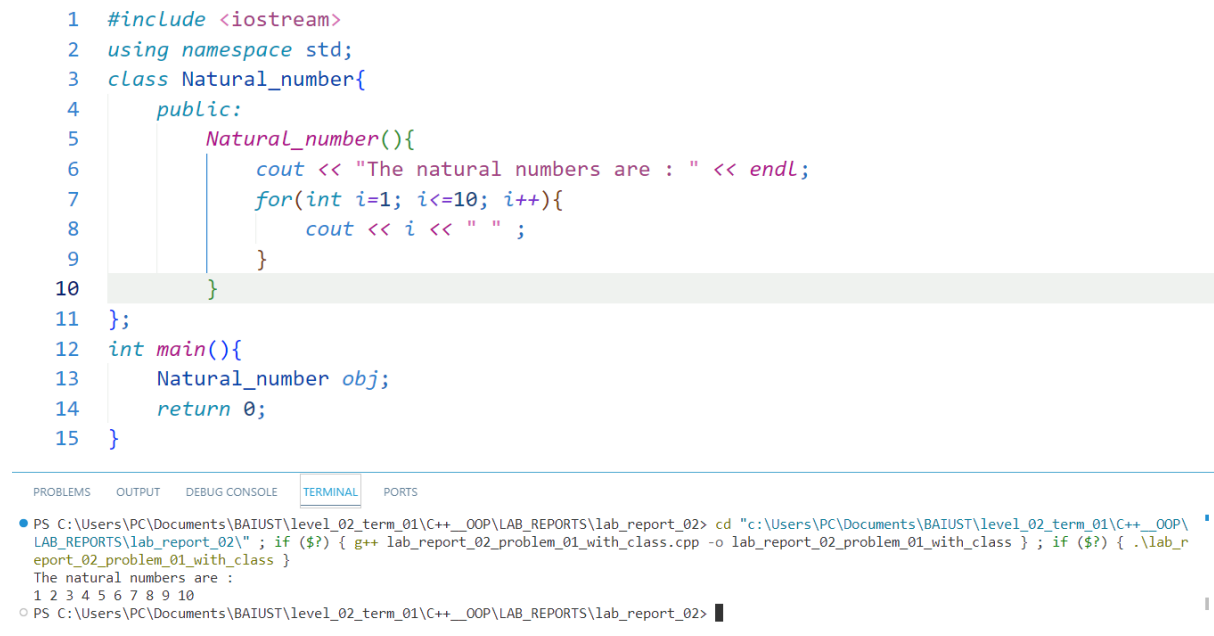
○ PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>

Problem_01_with_class

Code:

```
#include <iostream>
using namespace std;
class Natural_number{
public:
    Natural_number(){
        cout << "The natural numbers are : " << endl;
        for(int i=1; i<=10; i++){
            cout << i << " ";
        }
    }
};
int main(){
    Natural_number obj;
    return 0;
}
```

Screenshot :



The screenshot displays a C++ IDE with a code editor and a terminal window. The code editor shows the following code:

```
1 #include <iostream>
2 using namespace std;
3 class Natural_number{
4     public:
5         Natural_number(){
6             cout << "The natural numbers are : " << endl;
7             for(int i=1; i<=10; i++){
8                 cout << i << " ";
9             }
10        }
11    };
12    int main(){
13        Natural_number obj;
14        return 0;
15    }
```

The terminal window shows the output of the program:

```
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\"; if ($?) { g++ lab_report_02_problem_01_with_class.cpp -o lab_report_02_problem_01_with_class }; if ($?) { .\lab_report_02_problem_01_with_class }
The natural numbers are :
1 2 3 4 5 6 7 8 9 10
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>
```

Problem_02_without_class

Code:

```
#include <iostream>
using namespace std;
int main(){
    int num, total = 0;
    cout << "Input a number of terms : " ;
    cin >> num;
    cout << "The number upto " << num << "th terms are : " << endl;
    for(int i=1; i<=num; i++){
        cout << i << " " ;
        total+= i;
    }
    cout << endl;
    cout << "The sum of the natural number is : " << total << endl;
    return 0;
}
```

Screenshot:

```
1  #include <iostream>
2  using namespace std;
3  int main(){
4      int num, total = 0;
5      cout << "Input a number of terms : " ;
6      cin >> num;
7      cout << "The number upto " << num << "th terms are : " << endl;
8      for(int i=1; i<=num; i++){
9          cout << i << " " ;
10         total+= i;
11     }
12     cout << endl;
13     cout << "The sum of the natural number is : " << total << endl;
14     return 0;
15 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

● PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_02_without_class.cpp -o lab_report_02_problem_02_without_class ; if (\$?) { .\lab_report_02_problem_02_without_class }

Input a number of terms : 7

The number upto 7th terms are :

1 2 3 4 5 6 7

The sum of the natural number is : 28

○ PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> █

Problem_02_with_class

Code:

```
#include <iostream>
using namespace std;
class Natural_number{
    private:
        int num, total = 0;
    public:
        void get_num(){
            cout << "Input a number of terms : " ;
            cin >> num;
        }
        void print_num(){
            cout << "The number upto " << num << "th terms are : " << endl;
            for(int i=1; i<=num; i++){
                cout << i << " " ;
                total+= i;
            }
            cout << endl;
            cout << "The sum of the natural number is : " << total << endl;
        }
};

int main(){
    Natural_number obj;
    obj.get_num();
    obj.print_num();
    return 0;
}
```

Screenshot :



The screenshot shows a C++ IDE with a code editor and a terminal window. The code editor displays the same code as the previous block. The terminal window shows the output of the program, which is as follows:

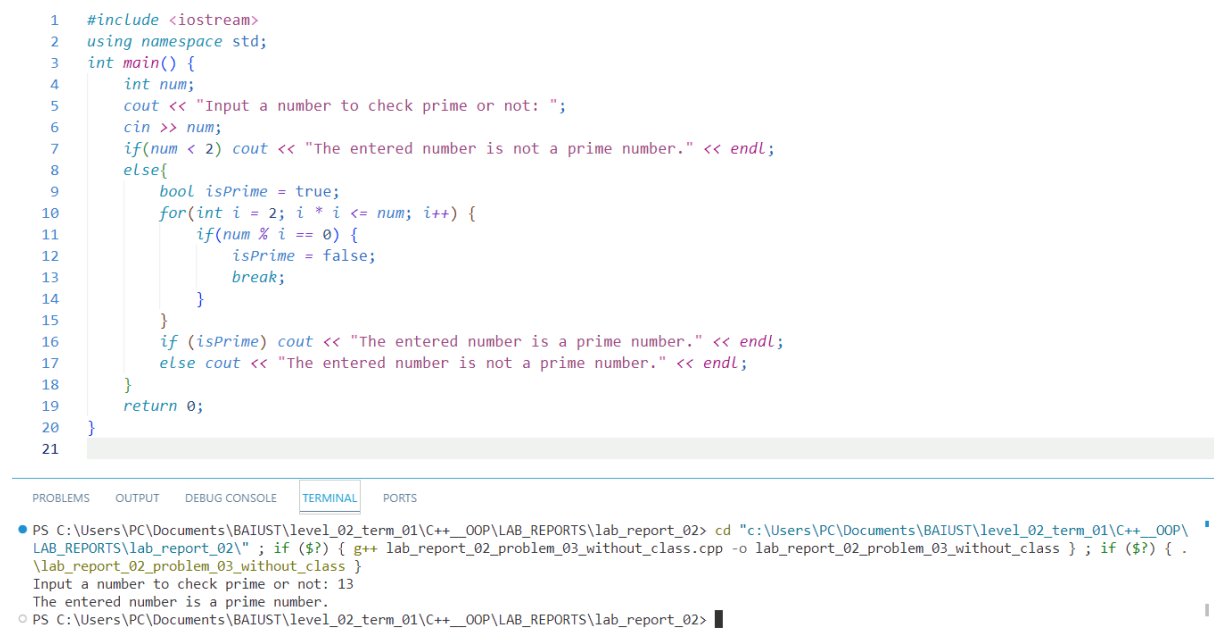
```
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if ($?) { g++ lab_report_02_problem_02_with_class.cpp -o lab_report_02_problem_02_with_class } ; if ($?) { .\lab_report_02_problem_02_with_class }
Input a number of terms : 7
The number upto 7th terms are :
1 2 3 4 5 6 7
The sum of the natural number is : 28
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>
```

Problem_03_without_class

Code:

```
#include <iostream>
using namespace std;
int main() {
    int num;
    cout << "Input a number to check prime or not: ";
    cin >> num;
    if(num < 2) cout << "The entered number is not a prime number." << endl;
    else{
        bool isPrime = true;
        for(int i = 2; i * i <= num; i++) {
            if(num % i == 0) {
                isPrime = false;
                break;
            }
        }
        if (isPrime) cout << "The entered number is a prime number." << endl;
        else cout << "The entered number is not a prime number." << endl;
    }
    return 0;
}
```

Screenshot:



The screenshot shows a C++ program in a code editor and its execution in a terminal window. The code is a prime number checker. The terminal output shows the program running, prompting for input, and correctly identifying 13 as a prime number.

```
1  #include <iostream>
2  using namespace std;
3  int main() {
4      int num;
5      cout << "Input a number to check prime or not: ";
6      cin >> num;
7      if(num < 2) cout << "The entered number is not a prime number." << endl;
8      else{
9          bool isPrime = true;
10         for(int i = 2; i * i <= num; i++) {
11             if(num % i == 0) {
12                 isPrime = false;
13                 break;
14             }
15         }
16         if (isPrime) cout << "The entered number is a prime number." << endl;
17         else cout << "The entered number is not a prime number." << endl;
18     }
19     return 0;
20 }
21
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

- PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_03_without_class.cpp -o lab_report_02_problem_03_without_class } ; if (\$?) { . \lab_report_02_problem_03_without_class }
Input a number to check prime or not: 13
The entered number is a prime number.
- PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>

Problem_03_with_class

Code:

```
#include <iostream>
using namespace std;
class Prime{
    private:
        int num;
    public:
        void check_prime(int num){
            if(num < 2) cout << "The entered number is not a prime number." << endl;
            else{
                bool isPrime = true;
                for(int i = 2; i * i <= num; i++) {
                    if(num % i == 0) { isPrime = false; break; }
                }
                if (isPrime) cout << "The entered number is a prime number." << endl;
                else cout << "The entered number is not a prime number." << endl;
            }
        }
        Prime(){
            cout << "Input a number to check prime or not: ";
            cin >> num;
            check_prime(num);
        }
};

int main() {
    Prime obj;
    return 0;
}
```

Screenshot :

```
1  #include <iostream>
2  using namespace std;
3  class Prime{
4      private:
5          int num;
6      public:
7          void check_prime(int num){
8              if(num < 2) cout << "The entered number is not a prime number." << endl;
9              else{
10                 bool isPrime = true;
11                 for(int i = 2; i * i <= num; i++) {
12                     if(num % i == 0) {
13                         isPrime = false;
14                         break;
15                     }
16                 }
17                 if (isPrime) cout << "The entered number is a prime number." << endl;
18                 else cout << "The entered number is not a prime number." << endl;
19             }
20         }
21         Prime(){
22             cout << "Input a number to check prime or not: ";
23             cin >> num;
24             check_prime(num);
25         }
26     };
27 int main() {
28     Prime obj;
29     return 0;
30 }
31
```

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_03_with_class.cpp -o lab_report_02_problem_03_with_class } ; if (\$?) { .\lab_report_02_problem_03_with_class }

Input a number to check prime or not: 13

The entered number is a prime number.

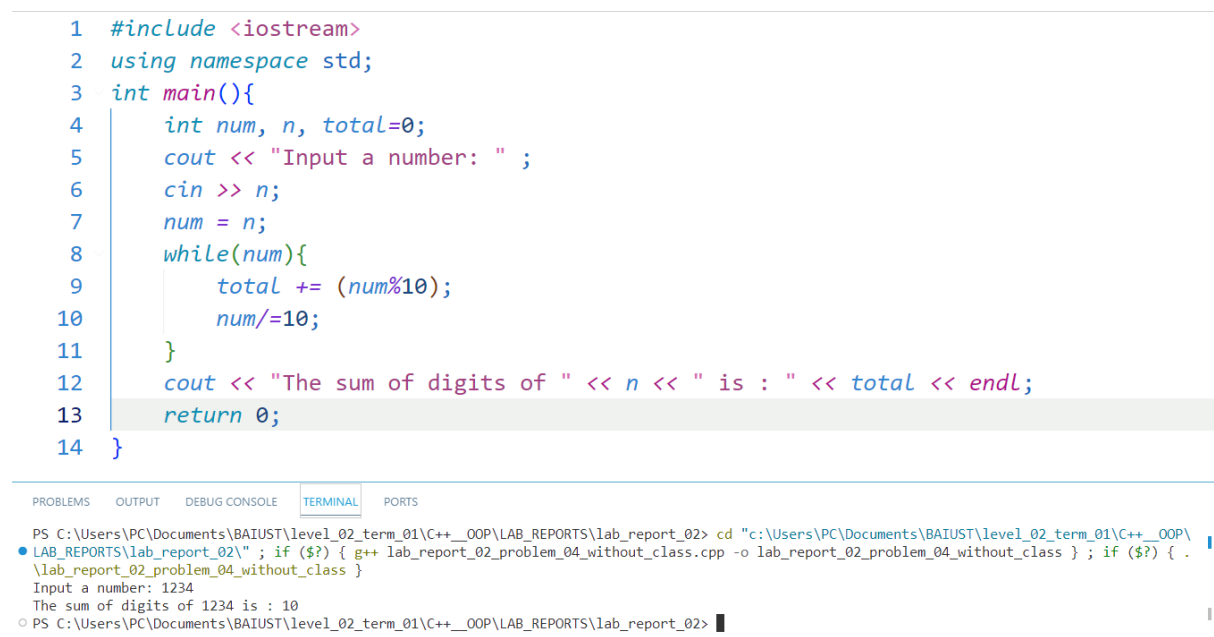
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>

Problem_04_without_class

Code:

```
#include <iostream>
using namespace std;
int main(){
    int num, n, total=0;
    cout << "Input a number: " ;
    cin >> n;
    num = n;
    while(num){
        total += (num%10);
        num/=10;
    }
    cout << "The sum of digits of " << n << " is : " << total << endl;
    return 0;
}
```

Screenshot :



The screenshot displays a C++ IDE with a code editor and a terminal window. The code editor shows the same code as the 'Code' section. The terminal window shows the execution of the program, including the prompt 'Input a number: 1234' and the output 'The sum of digits of 1234 is : 10'. The terminal window also shows the command prompt 'PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>' and the command to compile the program.

```
1 #include <iostream>
2 using namespace std;
3 int main(){
4     int num, n, total=0;
5     cout << "Input a number: " ;
6     cin >> n;
7     num = n;
8     while(num){
9         total += (num%10);
10        num/=10;
11    }
12    cout << "The sum of digits of " << n << " is : " << total << endl;
13    return 0;
14 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_04_without_class.cpp -o lab_report_02_problem_04_without_class } ; if (\$?) { . \lab_report_02_problem_04_without_class }

Input a number: 1234

The sum of digits of 1234 is : 10

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>

Problem_04_with_class

Code:

```
#include <iostream>
using namespace std;
class Digit_sum {
private:
    int num, n, total=0;
public:
    Digit_sum(){
        int num, n, total=0;
        cout << "Input a number: " ;
        cin >> n;
        num = n;
        while(num){
            total += (num%10);
            num/=10;
        }
        cout << "The sum of digits of " << n << " is : " << total << endl;
    }
};
int main(){
    Digit_sum obj;
    return 0;
}
```

Screenshot:



The screenshot displays a C++ IDE with a code editor and a terminal window. The code editor shows the same code as the previous block, with line numbers 1 through 22. The terminal window at the bottom shows the command prompt and the output of the program. The command executed is `cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02" & g++ lab_report_02_problem_04_with_class.cpp -o lab_report_02_problem_04_with_class & .\lab_report_02_problem_04_with_class`. The output shows the program prompting for input, receiving 1234, and calculating the sum of its digits as 10.

```
1  #include <iostream>
2  using namespace std;
3  class Digit_sum {
4      private:
5          int num, n, total=0;
6      public:
7          Digit_sum(){
8              int num, n, total=0;
9              cout << "Input a number: " ;
10             cin >> n;
11             num = n;
12             while(num){
13                 total += (num%10);
14                 num/=10;
15             }
16             cout << "The sum of digits of " << n << " is : " << total << endl;
17         }
18     };
19     int main(){
20         Digit_sum obj;
21         return 0;
22     }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02" & g++ lab_report_02_problem_04_with_class.cpp -o lab_report_02_problem_04_with_class & .\lab_report_02_problem_04_with_class

Input a number: 1234

The sum of digits of 1234 is : 10

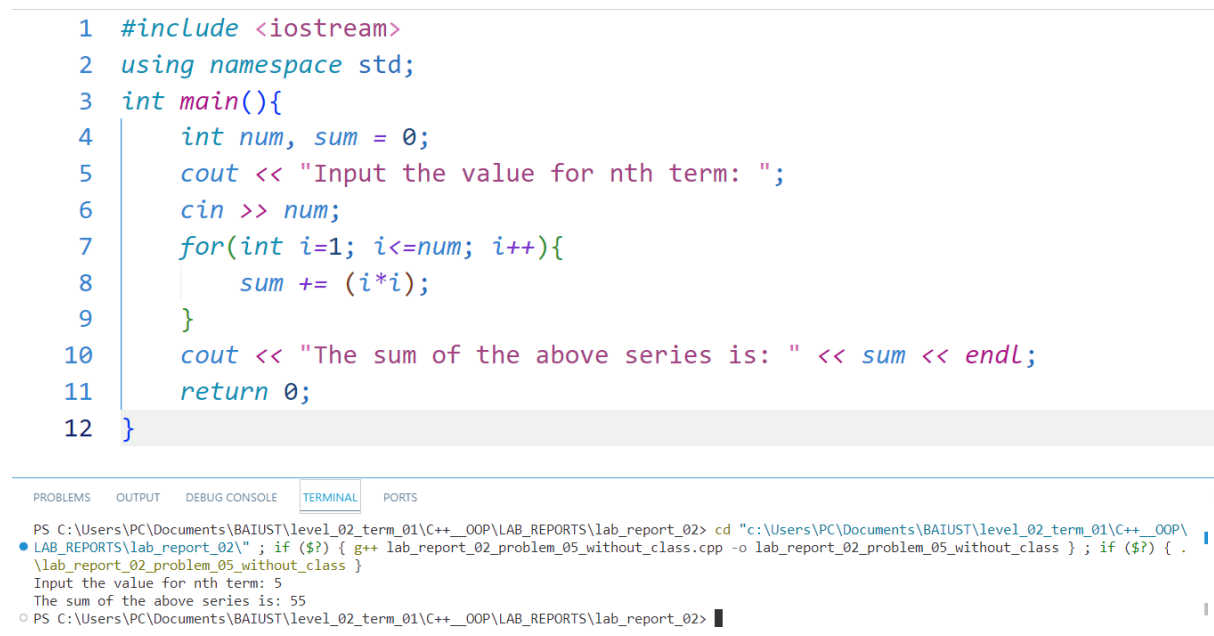
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>

Problem_05_without_class

Code:

```
#include <iostream>
using namespace std;
int main(){
    int num, sum = 0;
    cout << "Input the value for nth term: ";
    cin >> num;
    for(int i=1; i<=num; i++){
        sum += (i*i);
    }
    cout << "The sum of the above series is: " <<
sum << endl;
    return 0;
}
```

Screenshot :



```
1  #include <iostream>
2  using namespace std;
3  int main(){
4      int num, sum = 0;
5      cout << "Input the value for nth term: ";
6      cin >> num;
7      for(int i=1; i<=num; i++){
8          sum += (i*i);
9      }
10     cout << "The sum of the above series is: " << sum << endl;
11     return 0;
12 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_05_without_class.cpp -o lab_report_02_problem_05_without_class } ; if (\$?) { . \lab_report_02_problem_05_without_class }
Input the value for nth term: 5
The sum of the above series is: 55
PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>

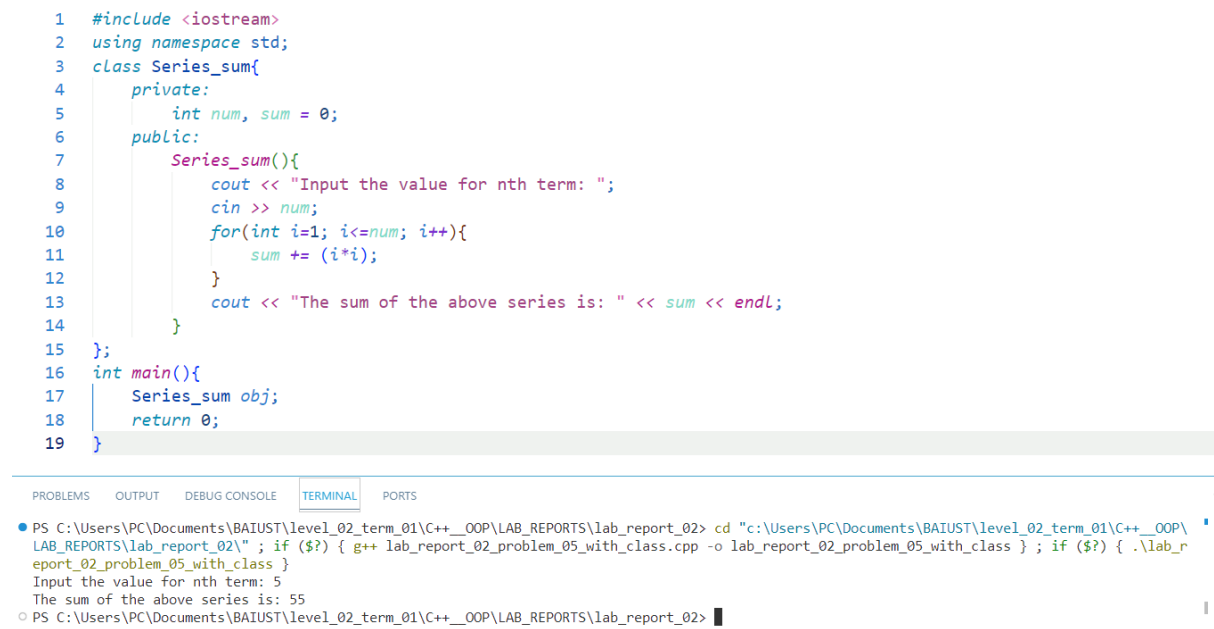
Problem_05_with_class

Code:

```
#include <iostream>
using namespace std;
class Series_sum{
private:
    int num, sum = 0;
public:
    Series_sum(){
        cout << "Input the value for nth term: ";
        cin >> num;
        for(int i=1; i<=num; i++){
            sum += (i*i);
        }
        cout << "The sum of the above series is: " << sum << endl;
    }
};

int main(){
    Series_sum obj;
    return 0;
}
```

Screenshot:



```
1  #include <iostream>
2  using namespace std;
3  class Series_sum{
4      private:
5          int num, sum = 0;
6      public:
7          Series_sum(){
8              cout << "Input the value for nth term: ";
9              cin >> num;
10             for(int i=1; i<=num; i++){
11                 sum += (i*i);
12             }
13             cout << "The sum of the above series is: " << sum << endl;
14         }
15     };
16     int main(){
17         Series_sum obj;
18         return 0;
19     }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

- PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02> cd "c:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02\" ; if (\$?) { g++ lab_report_02_problem_05_with_class.cpp -o lab_report_02_problem_05_with_class } ; if (\$?) { .\lab_report_02_problem_05_with_class }

Input the value for nth term: 5
The sum of the above series is: 55

PS C:\Users\PC\Documents\BAIUST\level_02_term_01\C++_OOP\LAB_REPORTS\lab_report_02>