Meeting 4

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Github: https://github.com/TheKurusUGM/Praktikum-Pemograman-UGM-/tree/8c0db7a227b16d1a6cb9ddda2944ab91b9001d2d/Week$_4$

1 First Number

Question:
Write a program that calculates the sum of all natural numbers up to a given number n. The program should prompt the user for an integer input n and use a for loop to compute the sum.

Answer:

```cpp

#include <iostream>
using namespace std;

int main() {
    int n, sum = 0;

    cout << "Enter a positive integer: ";
    cin >> n;

    if (n < 0) {
        cout << "Please enter a positive integer." << endl;
        return 1;
    }

    for (int i = 1; i <= n; ++i) {
        sum += i;
    }

```

```
20      cout << "The sum of all natural numbers up to " << n << "
        ↪  is: " << sum << endl;
21
22      return 0;
23  }
```

2 Explanation:

Initialization (int i = 1):
The loop starts by setting the variable i to 1. This is the starting point of the loop.

Condition (i <= n):
Before each iteration of the loop, the condition i <= n is checked. This means the loop will continue as long as i is less than or equal to n (the number the user inputs). Once i becomes greater than n, the loop stops.

Iteration:
- First Iteration:
i is 1. The loop adds i (which is 1) to sum (which is initially 0).
So, sum becomes 1.

- Second Iteration:
i becomes 2 (because ++i increments i by 1 after each iteration).
The loop adds 2 to sum (which is 1 from the previous iteration).
Now, sum becomes 3 (1 + 2 = 3).

- Third Iteration: is incremented to 3. The
loop adds 3 to sum (which is 3 now).
Now, sum becomes 6 (3 + 3 = 6).

- Continue Until i > n:
This process continues until i becomes greater than n. At that point, the loop exits.

- Final Output:
Once the loop ends, the total sum is stored in the variable sum, and the program prints this value.

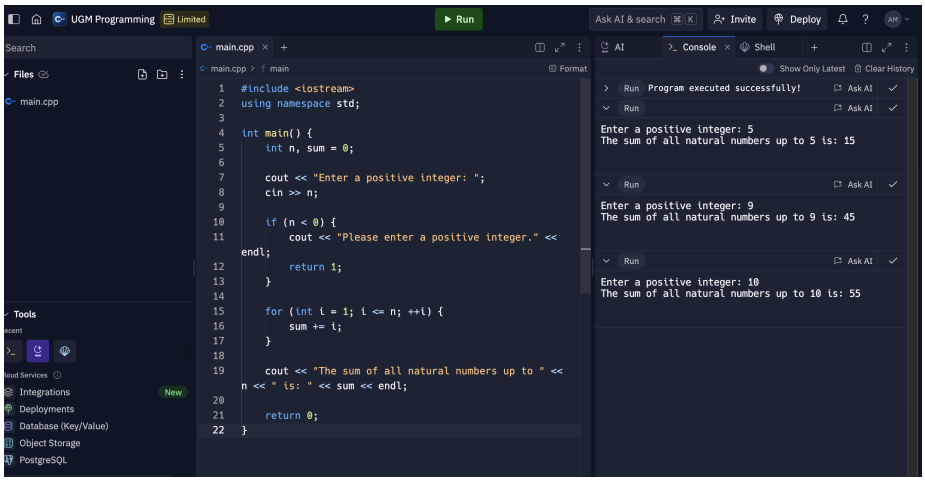

Figure 1: Output from the code

3 Second number

Write a program that prints the multiplication table for a given integer n. The program should use a for loop to print the product of n with integers from 1 to 10.

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

int main() {
    int n;

    cout << "Enter an integer: ";
    cin >> n;

    cout << "Multiplication table for " << n << ":\n";
    for (int i = 1; i <= 10; ++i) {
        cout << n << " x " << i << " = " << n * i << endl;
    }

    return 0;
}
```

4 Explanation:

The program begins by asking the user to input an integer, n.

- cin >> n; stores the input value in the variable n, which will be the number for which the
multiplication table will be printed.

```
cout << "Multiplication table for " << n << ":\n";
```

- This line simply prints a header telling the user which multiplication table is being printed.
- The for loop runs from i = 1 to i = 10.

- Initialization (int i = 1): This sets the starting value of i to 1, meaning the loop begins at 1.
The loop will continue to execute as long as i is less than or equal to 10. Once i becomes greater than 10, the loop stops.

- Increment (++i): After each iteration of the multiplication, the value of i increases by 1.

- In each iteration, the program multiplies n by the current value of i and prints the result. For example:
When i = 1, it prints: n x 1 = n * 1.
When i = 2, it prints: n x 2 = n * 2.
This continues until i reaches 10.

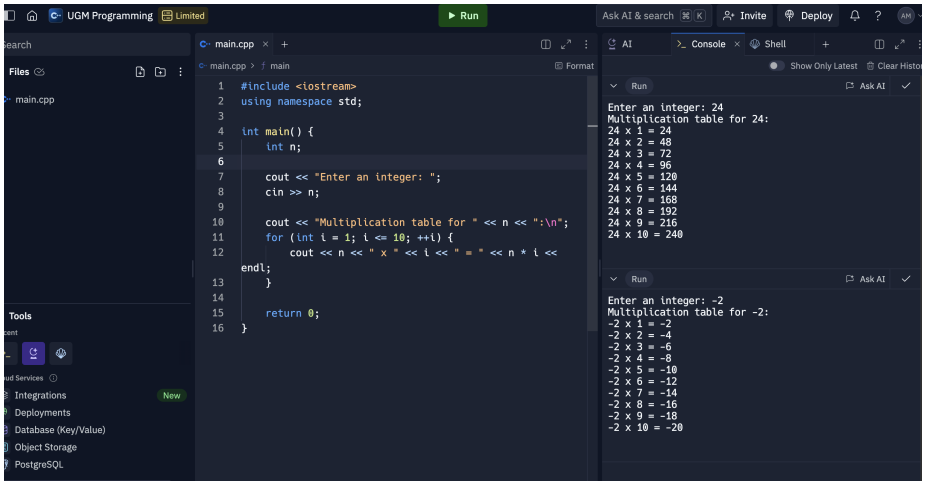

Figure 2: Multiplication table output