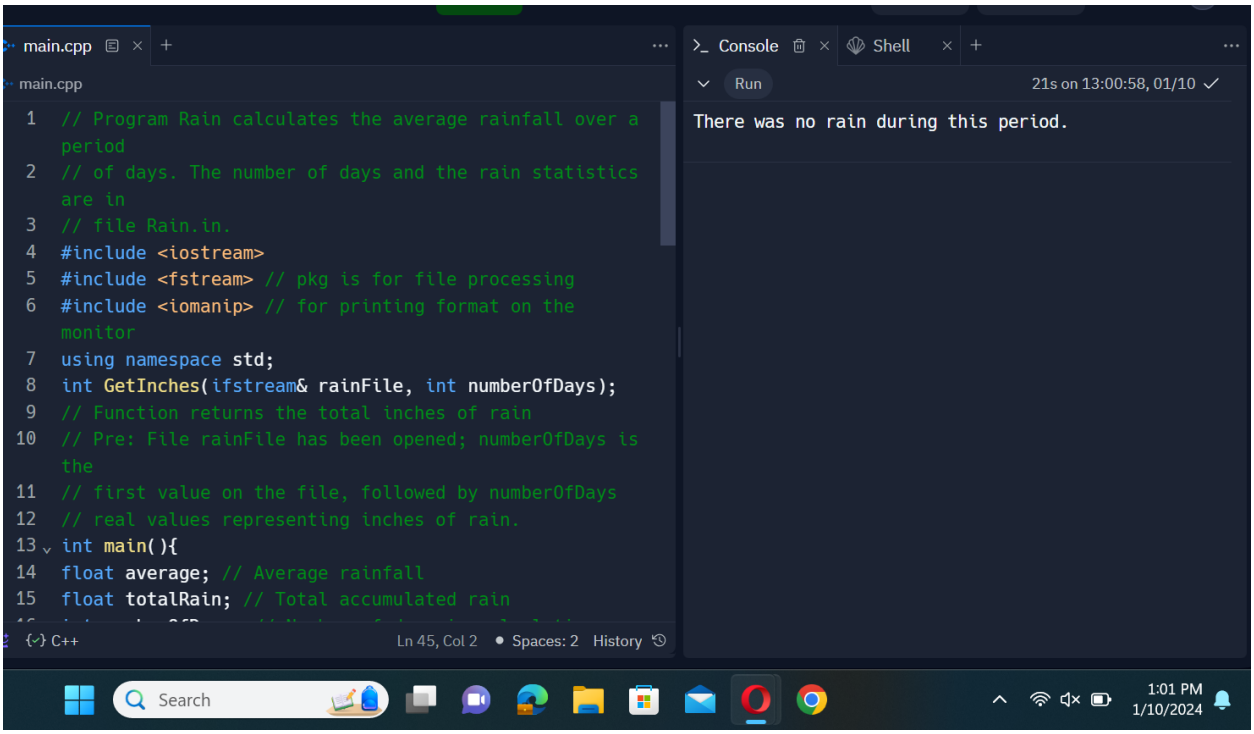
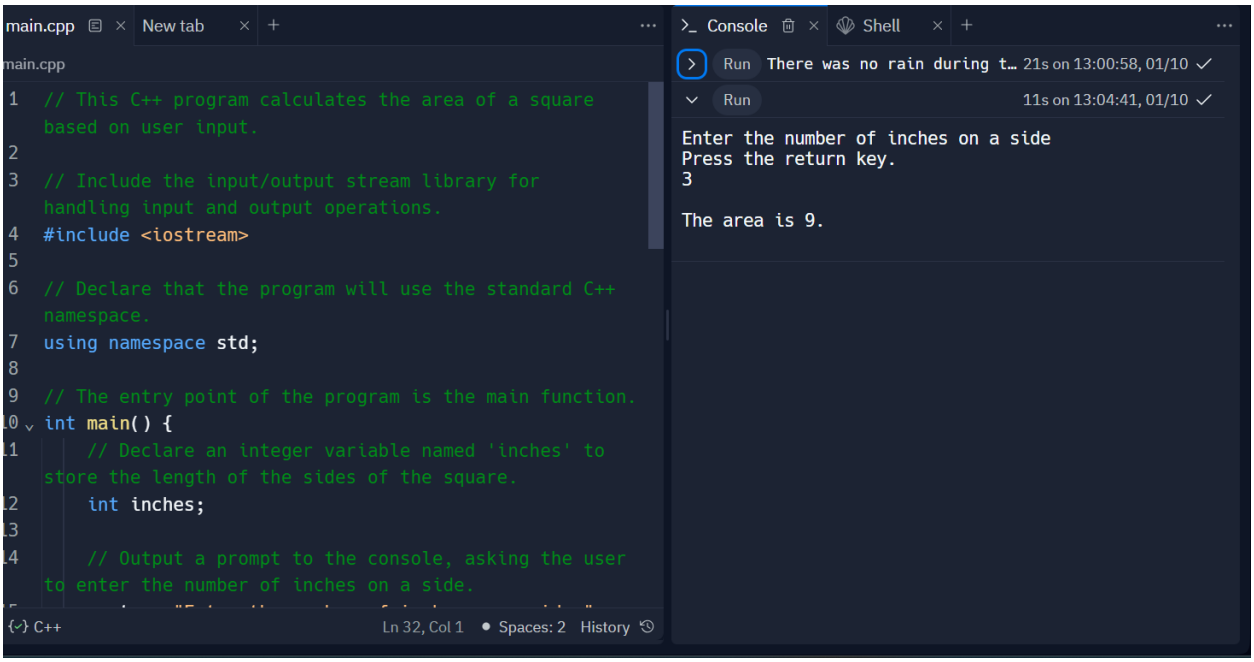
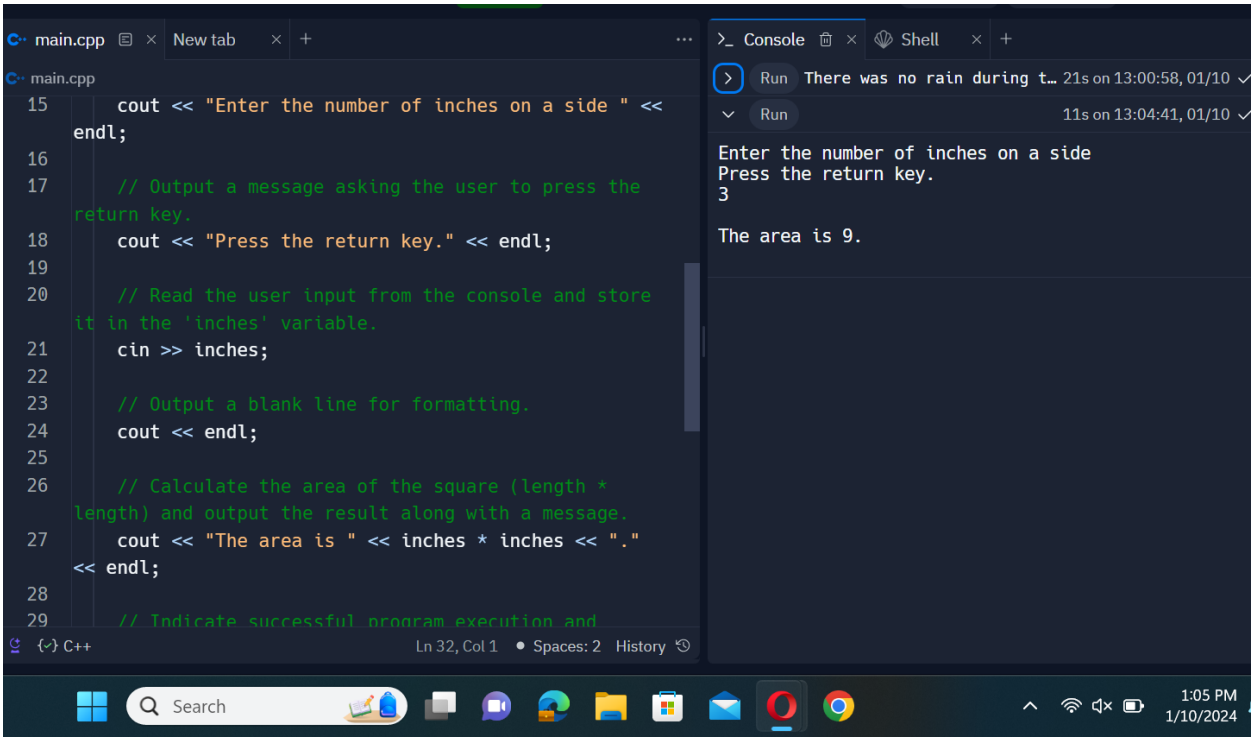
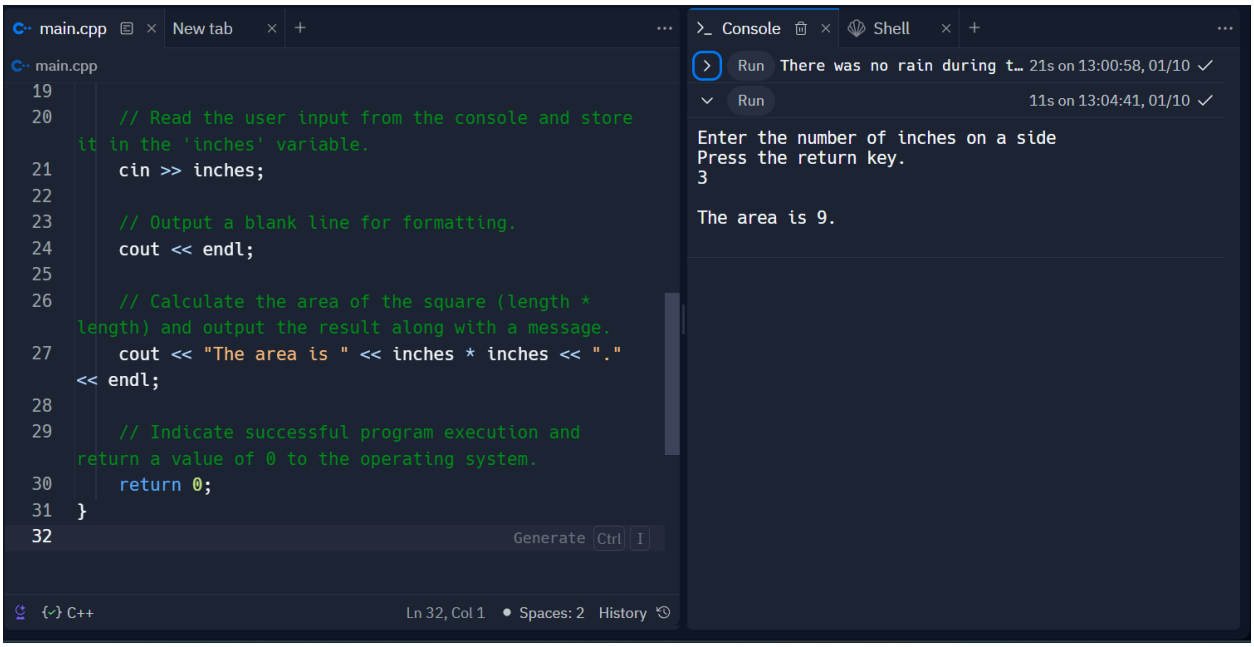
1.Create your personal account of C++ online compiler at the following link and run the first program on it.



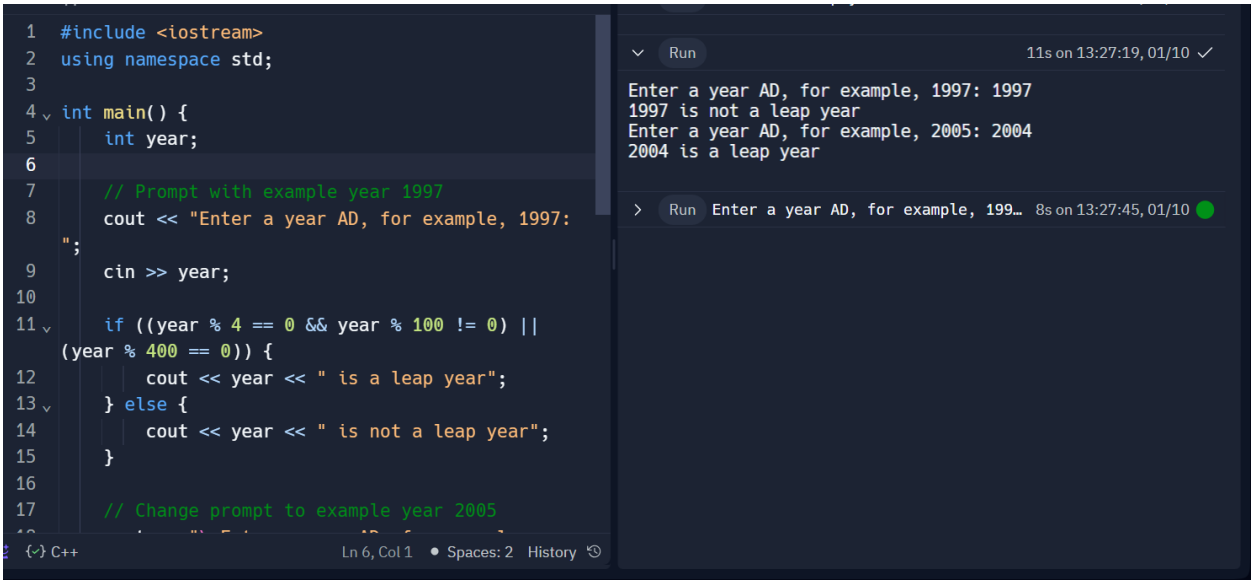
2. Enter the editor and key in the following program. And explain the meanings of each statement.







3. Write the program to check leap year as the first programming exercise, and verify your program by the following cases
a. The input prompt is "Enter a year AD, for example, 1997"
b. Change the prompt so that the example year is 2005.



```
        cout << year << " is a leap year";
    } else {
        cout << year << " is not a leap year";
    }

    // Change prompt to example year 2005
    cout << "\nEnter a year AD, for example,
2005: ";
    cin >> year;

    if ((year % 4 == 0 && year % 100 != 0) ||
(year % 400 == 0)) {
        cout << year << " is a leap year";
    } else {
        cout << year << " is not a leap year";
    }

    return 0;
}
```

```
Run                                    11s on 13:27:19, 01/10 ✓
Enter a year AD, for example, 1997: 1997
1997 is not a leap year
Enter a year AD, for example, 2005: 2004
2004 is a leap year

Run  Enter a year AD, for example, 19…  12s on 13:27:45, 01/10
```

4. Figure out the program to print the following pattern by loop structure

main.cpp

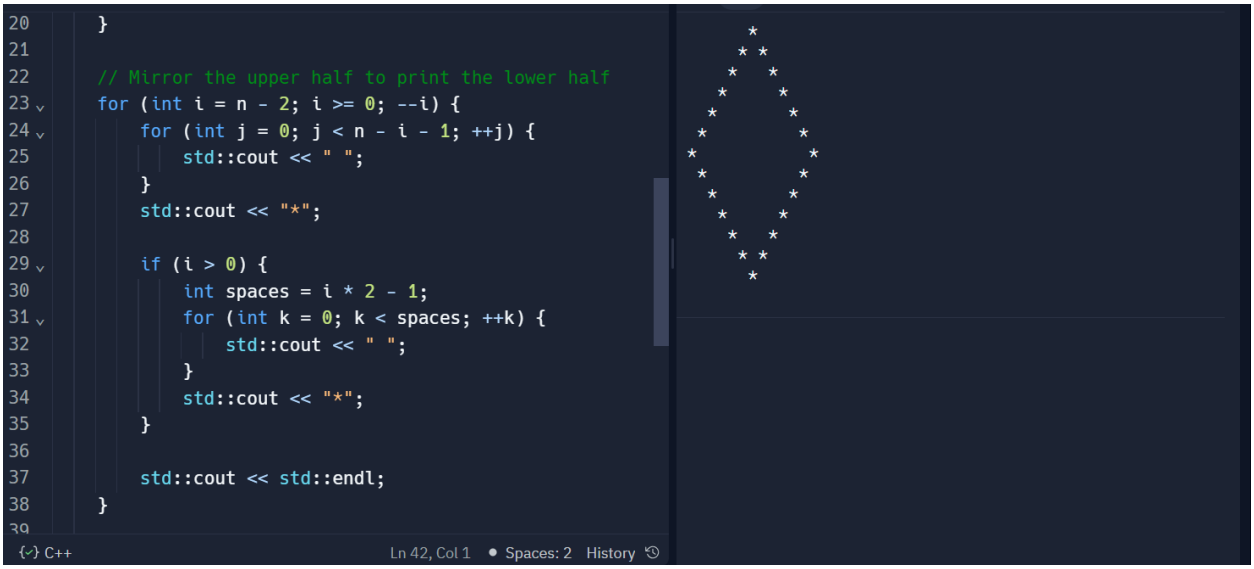
```
#include <iostream>

int main() {
    int n = 7; // Number of lines
    for (int i = 0; i < n; ++i) {
        for (int j = 0; j < n - i - 1; ++j) {
            std::cout << " ";
        }
        std::cout << "*";

        if (i > 0) {
            int spaces = i * 2 - 1;
            for (int k = 0; k < spaces; ++k) {
                std::cout << " ";
            }
            std::cout << "*";
        }

        std::cout << std::endl;
```

C++ Ln 42, Col 1 Spaces: 2 History

Console Shell

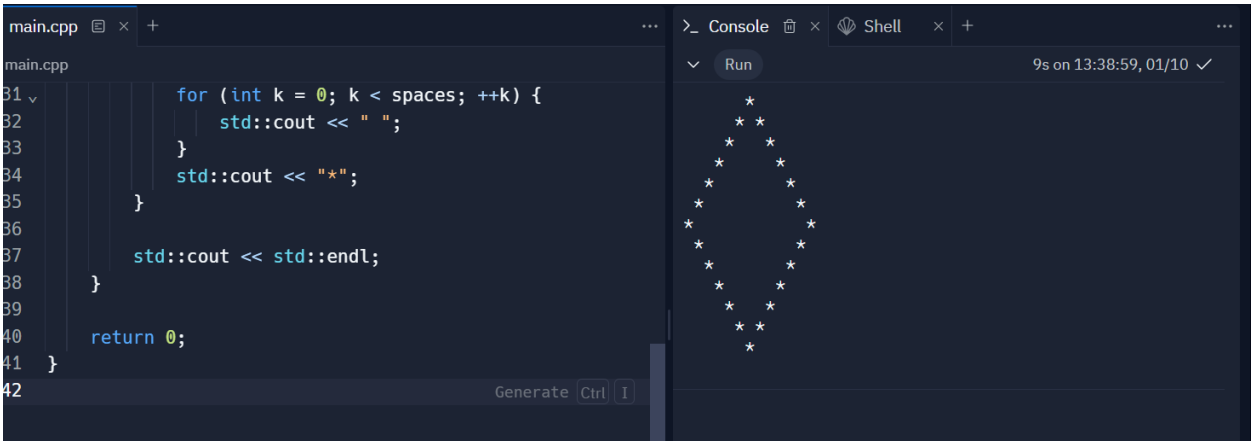
Run 9s on 13:38:59, 01/10 ✓

```
      *
     * *
    *   *
   *     *
  *       *
 *         *
*           *
 *         *
  *       *
   *     *
    *   *
     * *
      *
```



```
    }

    // Mirror the upper half to print the lower half
    for (int i = n - 2; i >= 0; --i) {
        for (int j = 0; j < n - i - 1; ++j) {
            std::cout << " ";
        }
        std::cout << "*";

        if (i > 0) {
            int spaces = i * 2 - 1;
            for (int k = 0; k < spaces; ++k) {
                std::cout << " ";
            }
            std::cout << "*";
        }

        std::cout << std::endl;
    }
```

```
    *
   * *
  *   *
 *     *
*       *
 *     *
  *   *
   * *
    *
```



main.cpp

```
            for (int k = 0; k < spaces; ++k) {
                std::cout << " ";
            }
            std::cout << "*";
        }

        std::cout << std::endl;
    }

    return 0;
}
```

Console | Shell | Run | 9s on 13:38:59, 01/10

```
    *
   * *
  *   *
 *     *
*       *
 *     *
  *   *
   * *
    *
```