| Activity No. 2.2 | |
|---|---|
| **Hands-on Activity 2.2: Control Structures (part 1)** | |
| **Course Code:** CPE007 | **Program:** Computer Engineering |
| **Course Title:** Programming Logic and Design | **Date Performed:** 8/11/2025 |
| **Section:** CPE11S1 | **Date Submitted:** 8/12/2025 |
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| **Output** | |

**Exercise 1:** Counter- Controlled Repetition. A class of ten students took a quiz. The grades (integers in the range of 0 to 100) for this quiz are available to you. Determine the class average on the quiz. Put your answer in the output section of the activity template. **Ensure that the screen shot of the code and the output are readable.**

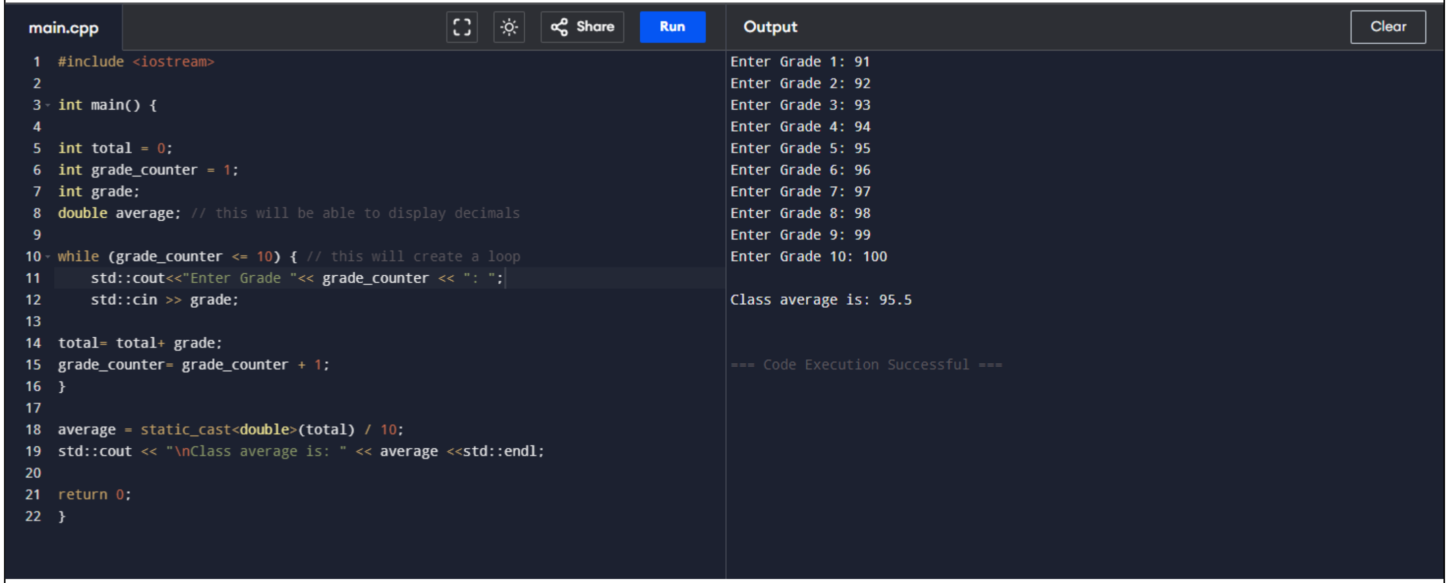
Using the following **pseudocode** the program can be as follows:

```
Set total to zero
Set grade counter to one
While grade counter is less than or equal to ten
Input the next grade
Add the grade into the total
Add one to the grade counter
Set the class average to the total divided by ten
Print the class average
```

**CODE:**

```
#include <iostream>

int main() {
    int total = 0;
    int grade_counter = 1;
    int grade;
    double average; // this will be able to display decimals

    while (grade_counter <= 10) { // this will create a loop
        std::cout << "Enter Grade " << grade_counter << ": ";
        std::cin >> grade;

        total = total + grade;
        grade_counter = grade_counter + 1;
    }

    average = static_cast<double>(total) / 10;
    std::cout << "\nClass average is: " << average << std::endl;

    return 0;
}
```

**RESULT:**



```cpp
#include <iostream>

int main() {

int total = 0;
int grade_counter = 1;
int grade;
double average; // this will be able to display decimals

while (grade_counter <= 10) { // this will create a loop
    std::cout<<"Enter Grade "<< grade_counter << ": ";
    std::cin >> grade;

total= total+ grade;
grade_counter= grade_counter + 1;
}

average = static_cast<double>(total) / 10;
std::cout << "\nClass average is: " << average <<std::endl;

return 0;
}
```

```
Enter Grade 1: 91
Enter Grade 2: 92
Enter Grade 3: 93
Enter Grade 4: 94
Enter Grade 5: 95
Enter Grade 6: 96
Enter Grade 7: 97
Enter Grade 8: 98
Enter Grade 9: 99
Enter Grade 10: 100

Class average is: 95.5


=== Code Execution Successful ===
```

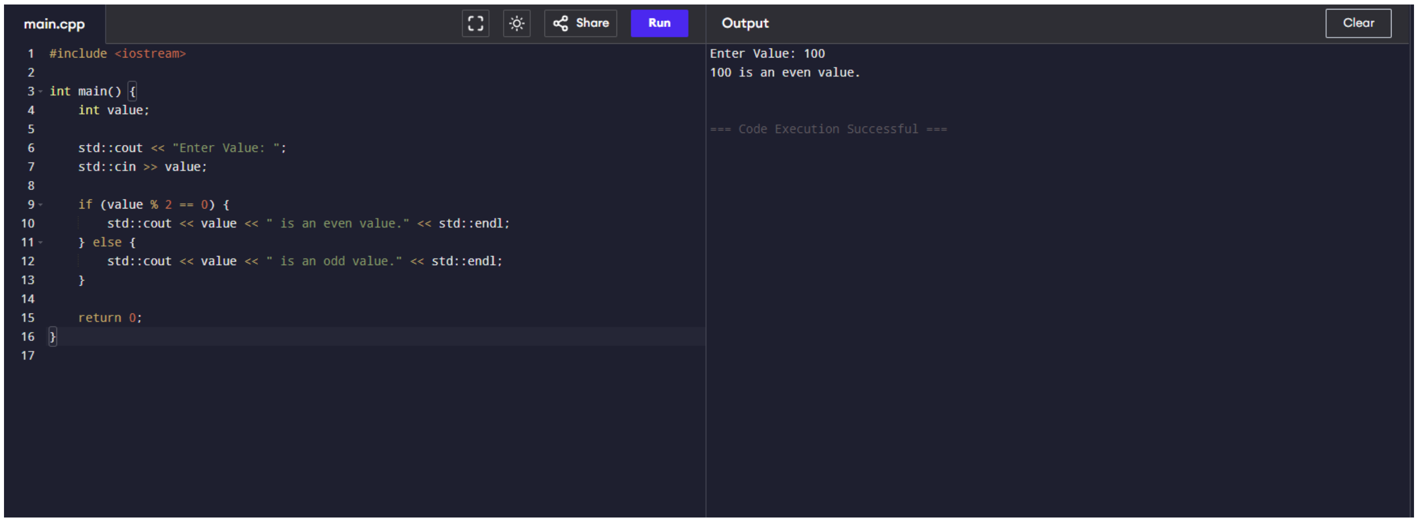
**Supplementary Activity**

1. Using conditional statements (if-else statements), write a program that asks a user for a number and prints out if it is an even or an odd number.

**CODE:**

```cpp
#include <iostream>

int main() {
   int value;

   std::cout << "Enter Value: ";
   std::cin >> value;

   if (value % 2 == 0) {
      std::cout << value << " is an even value." << std::endl;
   } else {
      std::cout << value << " is an odd value." << std::endl;
   }

   return 0;
}
```

**RESULT:**
EVEN VALUE

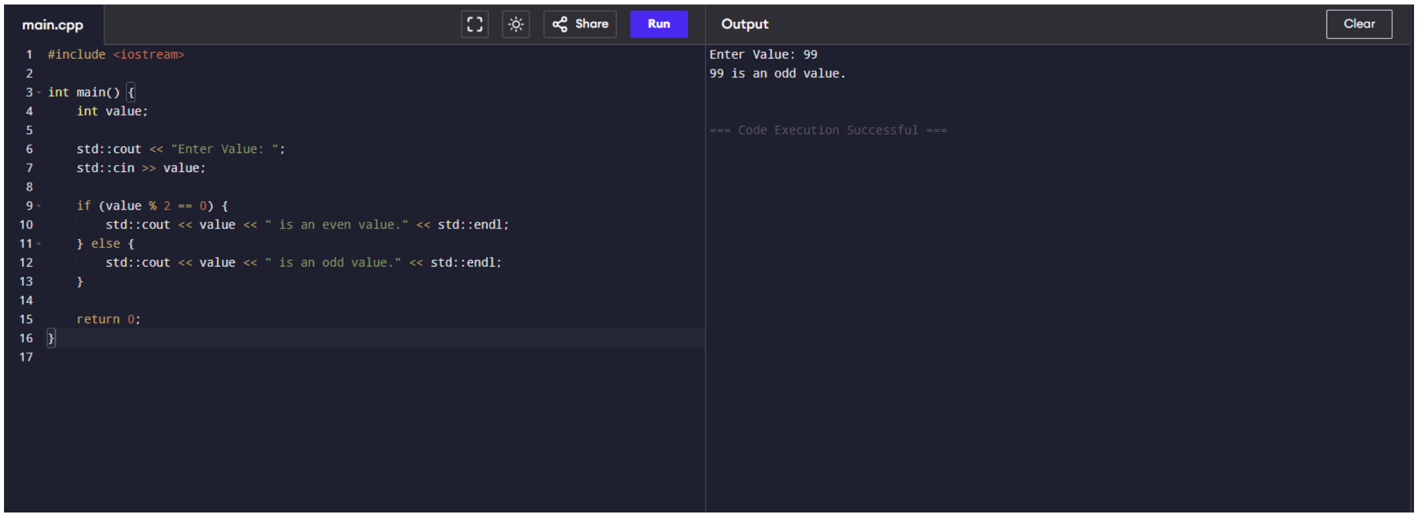

main.cpp

```
#include <iostream>

int main() {
    int value;

    std::cout << "Enter Value: ";
    std::cin >> value;

    if (value % 2 == 0) {
        std::cout << value << " is an even value." << std::endl;
    } else {
        std::cout << value << " is an odd value." << std::endl;
    }

    return 0;
}
```

Output

```
Enter Value: 100
100 is an even value.


=== Code Execution Successful ===
```

ODD VALUE


main.cpp

```
#include <iostream>

int main() {
    int value;

    std::cout << "Enter Value: ";
    std::cin >> value;

    if (value % 2 == 0) {
        std::cout << value << " is an even value." << std::endl;
    } else {
        std::cout << value << " is an odd value." << std::endl;
    }

    return 0;
}
```

Output

```
Enter Value: 99
99 is an odd value.


=== Code Execution Successful ===
```

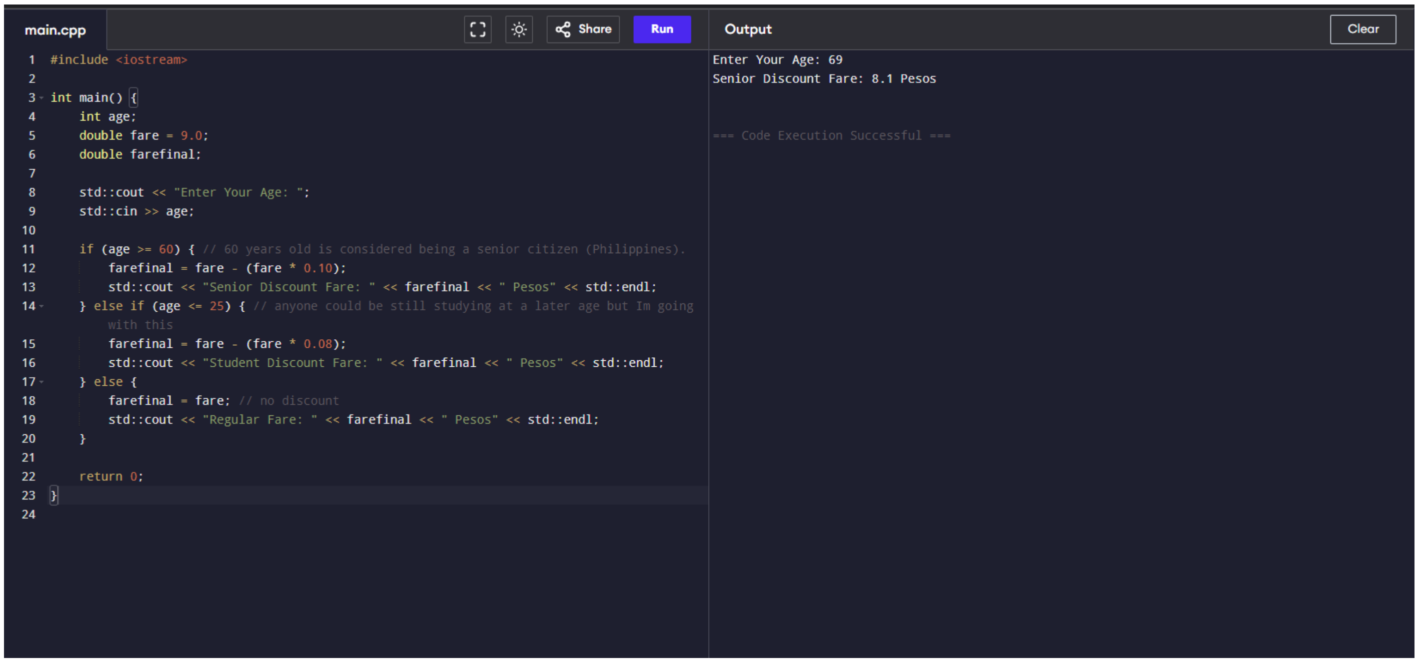
2. Using conditional statements, write a program that computes for 10 percent fare discount of a senior citizen and 8 percent fare discount of a student. There will be no discount if not a senior citizen and not a student. The user will be asked to enter age. The minimum fare is 9 pesos.

**CODE:**

```
#include <iostream>

int main() {
    int age;
    double fare = 9.0;
    double farefinal;

    std::cout << "Enter Your Age: ";
    std::cin >> age;

    if (age >= 60) { // 60 years old is considered being a senior citizen (Philippines).
        farefinal = fare - (fare * 0.10);
        std::cout << "Senior Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else if (age <= 25) { // anyone could be still studying at a later age but Im going with this
        farefinal = fare - (fare * 0.08);
        std::cout << "Student Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else {
        farefinal = fare; // no discount
        std::cout << "Regular Fare: " << farefinal << " Pesos" << std::endl;
    }

    return 0;
}
```

**RESULT:**

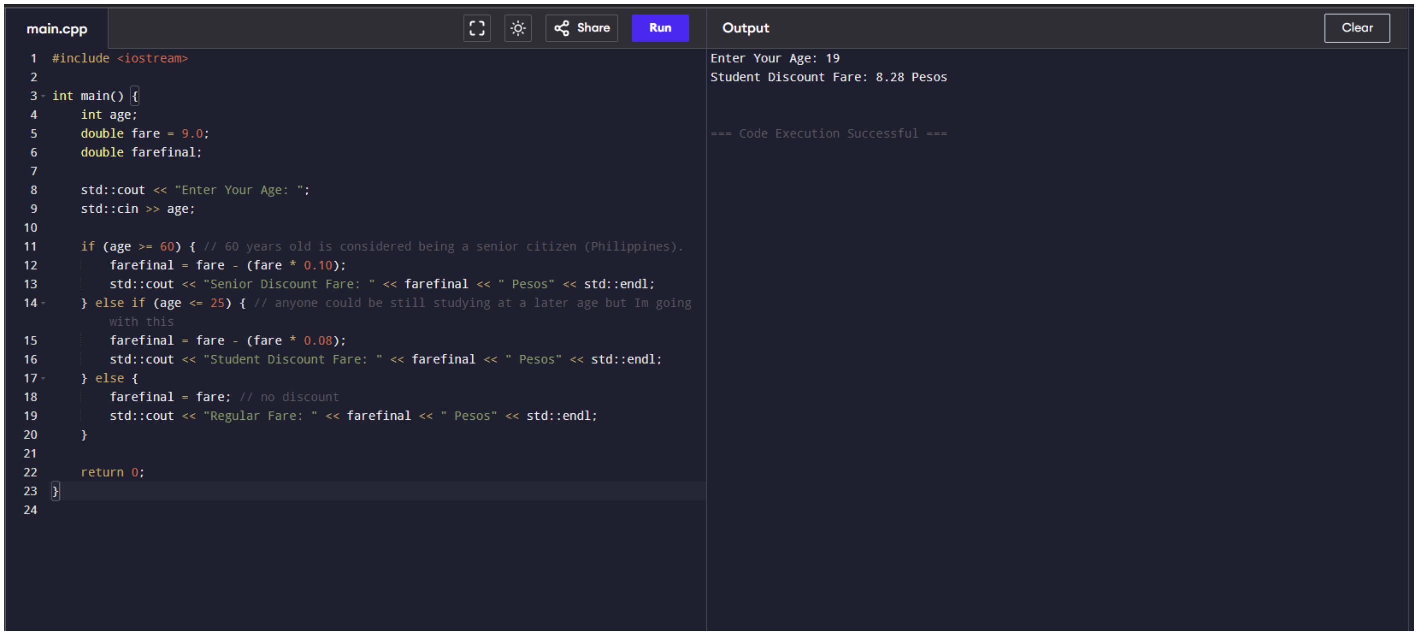
SENIOR DISCOUNT FARE



```
#include <iostream>

int main() {
    int age;
    double fare = 9.0;
    double farefinal;

    std::cout << "Enter Your Age: ";
    std::cin >> age;

    if (age >= 60) { // 60 years old is considered being a senior citizen (Philippines).
        farefinal = fare - (fare * 0.10);
        std::cout << "Senior Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else if (age <= 25) { // anyone could be still studying at a later age but Im going
    with this
        farefinal = fare - (fare * 0.08);
        std::cout << "Student Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else {
        farefinal = fare; // no discount
        std::cout << "Regular Fare: " << farefinal << " Pesos" << std::endl;
    }

    return 0;
}
```

```
Enter Your Age: 69
Senior Discount Fare: 8.1 Pesos


=== Code Execution Successful ===
```

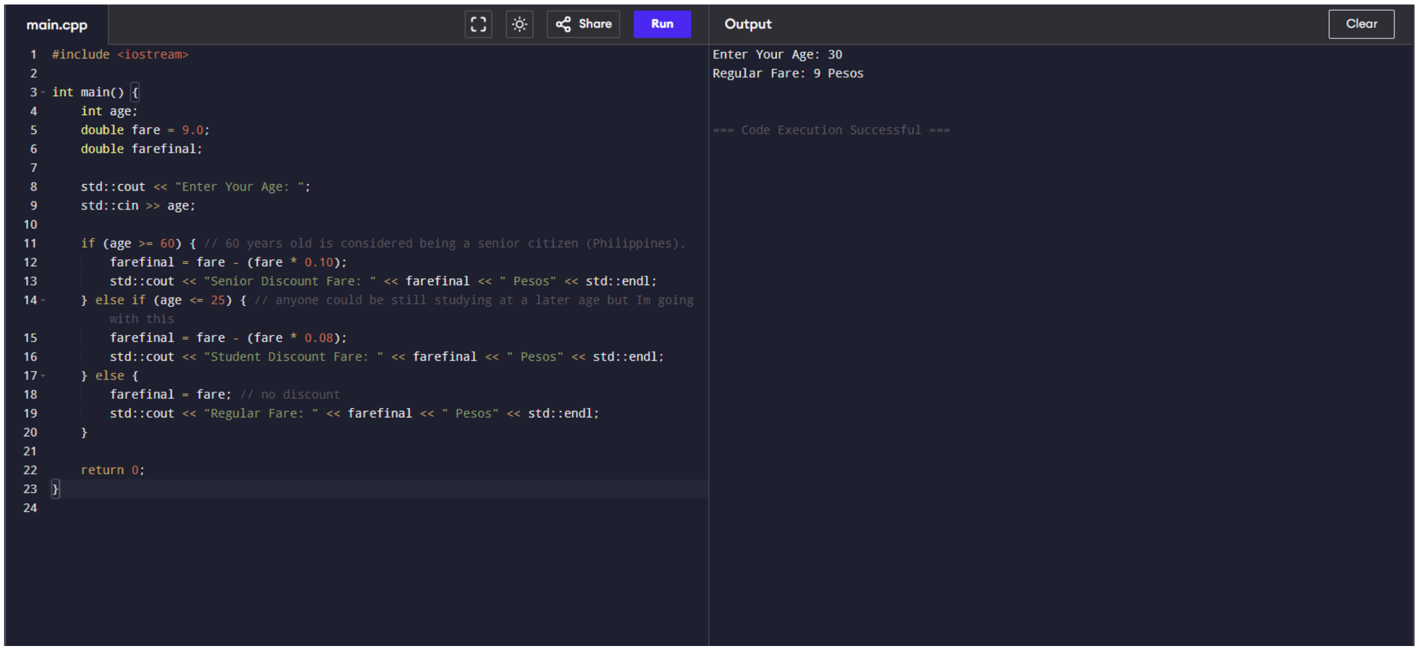
STUDENT DISCOUNT FARE



```
#include <iostream>

int main() {
    int age;
    double fare = 9.0;
    double farefinal;

    std::cout << "Enter Your Age: ";
    std::cin >> age;

    if (age >= 60) { // 60 years old is considered being a senior citizen (Philippines).
        farefinal = fare - (fare * 0.10);
        std::cout << "Senior Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else if (age <= 25) { // anyone could be still studying at a later age but Im going
    with this
        farefinal = fare - (fare * 0.08);
        std::cout << "Student Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else {
        farefinal = fare; // no discount
        std::cout << "Regular Fare: " << farefinal << " Pesos" << std::endl;
    }

    return 0;
}
```

```
Enter Your Age: 19
Student Discount Fare: 8.28 Pesos

=== Code Execution Successful ===
```

REGULAR FARE



```cpp
#include <iostream>

int main() {
    int age;
    double fare = 9.0;
    double farefinal;

    std::cout << "Enter Your Age: ";
    std::cin >> age;

    if (age >= 60) { // 60 years old is considered being a senior citizen (Philippines).
        farefinal = fare - (fare * 0.10);
        std::cout << "Senior Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else if (age <= 25) { // anyone could be still studying at a later age but Im going
        with this
        farefinal = fare - (fare * 0.08);
        std::cout << "Student Discount Fare: " << farefinal << " Pesos" << std::endl;
    } else {
        farefinal = fare; // no discount
        std::cout << "Regular Fare: " << farefinal << " Pesos" << std::endl;
    }

    return 0;
}
```

```
Enter Your Age: 30
Regular Fare: 9 Pesos


=== Code Execution Successful ===
```

3. **Case Study**: Sentinel Controlled Repetition. Given the following pseudocode, create a program that will implement a sentinel-controlled repetition. For example, you can use (-1) as the sentinel value. You can use Problem 1 as your reference.

**Pseudocode:**

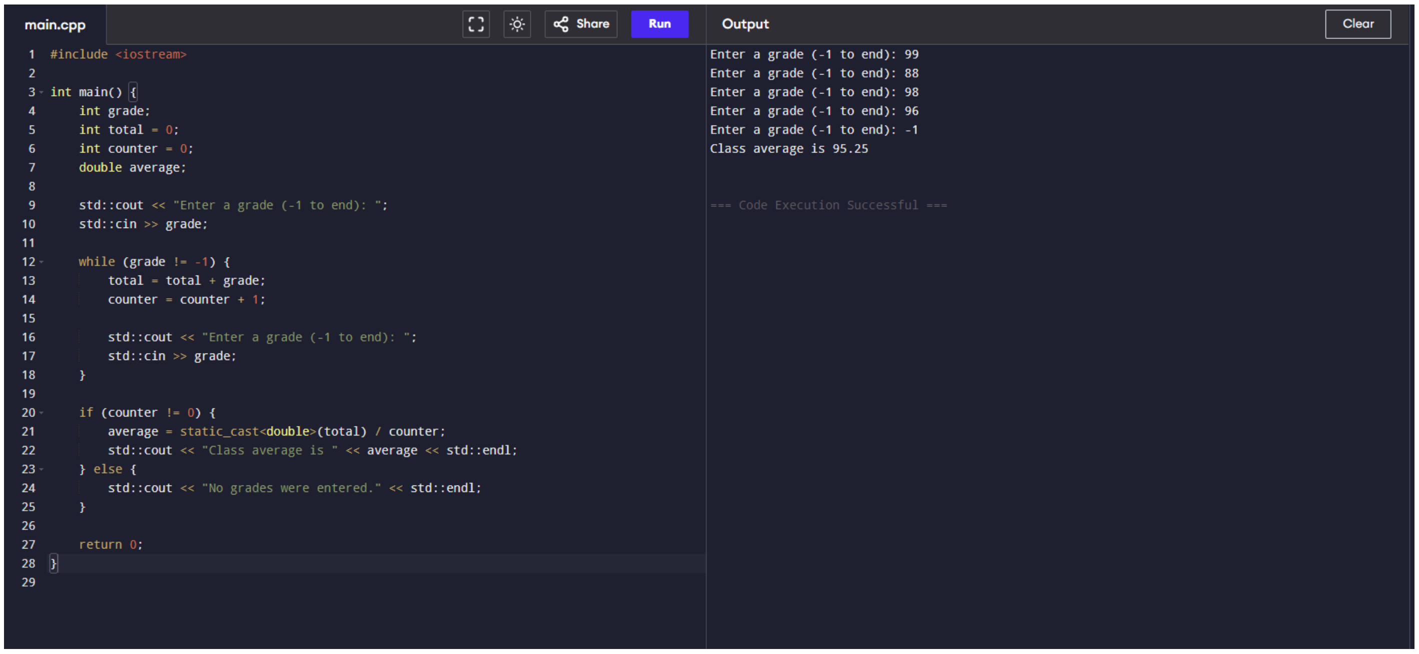
```
Initialize total to zero
Initialize counter to zero
Input the first grade
While the user has not as yet entered the sentinel
    Add this grade into the running total
    Add one to the grade counter
    Input the next grade (possibly the sentinel)
If the counter is not equal to zero
    Set the average to the total divided by the counter
    Print the average
else
    Print “No grades were entered”
```

**CODE:**

```cpp
#include <iostream>

int main() {
    int grade;
    int total = 0;
    int counter = 0;
    double average;

    std::cout << "Enter a grade (-1 to end): ";
    std::cin >> grade;

    while (grade != -1) {
        total = total + grade;
        counter = counter + 1;

        std::cout << "Enter a grade (-1 to end): ";
        std::cin >> grade;
    }

    if (counter != 0) {
        average = static_cast<double>(total) / counter;
        std::cout << "Class average is " << average << std::endl;
    } else {
        std::cout << "No grades were entered." << std::endl;
    }

    return 0;
}
```

**RESULT:**

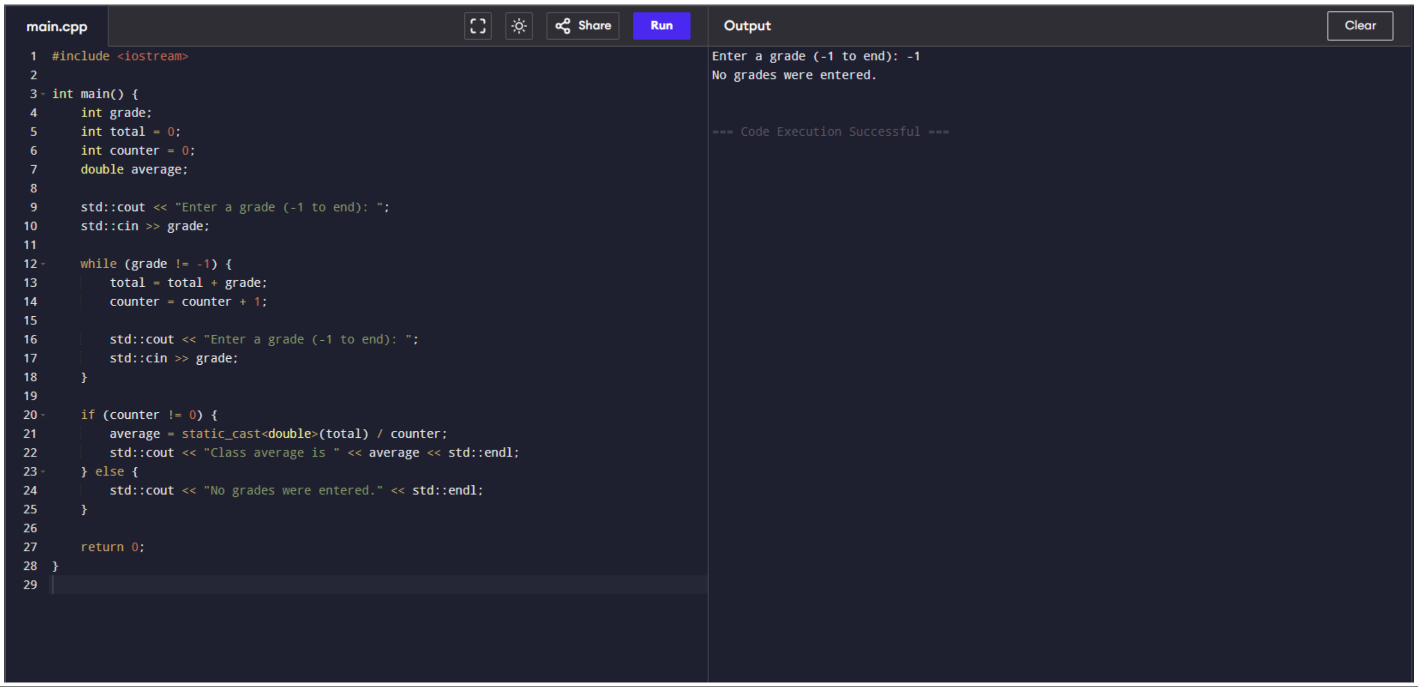
CLASS AVERAGE



```cpp
#include <iostream>

int main() {
    int grade;
    int total = 0;
    int counter = 0;
    double average;

    std::cout << "Enter a grade (-1 to end): ";
    std::cin >> grade;

    while (grade != -1) {
        total = total + grade;
        counter = counter + 1;

        std::cout << "Enter a grade (-1 to end): ";
        std::cin >> grade;
    }

    if (counter != 0) {
        average = static_cast<double>(total) / counter;
        std::cout << "Class average is " << average << std::endl;
    } else {
        std::cout << "No grades were entered." << std::endl;
    }

    return 0;
}
```

```
Enter a grade (-1 to end): 99
Enter a grade (-1 to end): 88
Enter a grade (-1 to end): 98
Enter a grade (-1 to end): 96
Enter a grade (-1 to end): -1
Class average is 95.25


=== Code Execution Successful ===
```

NO GRADES WERE ENTERED.



main.cpp

```cpp
#include <iostream>

int main() {
    int grade;
    int total = 0;
    int counter = 0;
    double average;

    std::cout << "Enter a grade (-1 to end): ";
    std::cin >> grade;

    while (grade != -1) {
        total = total + grade;
        counter = counter + 1;

        std::cout << "Enter a grade (-1 to end): ";
        std::cin >> grade;
    }

    if (counter != 0) {
        average = static_cast<double>(total) / counter;
        std::cout << "Class average is " << average << std::endl;
    } else {
        std::cout << "No grades were entered." << std::endl;
    }

    return 0;
}
```

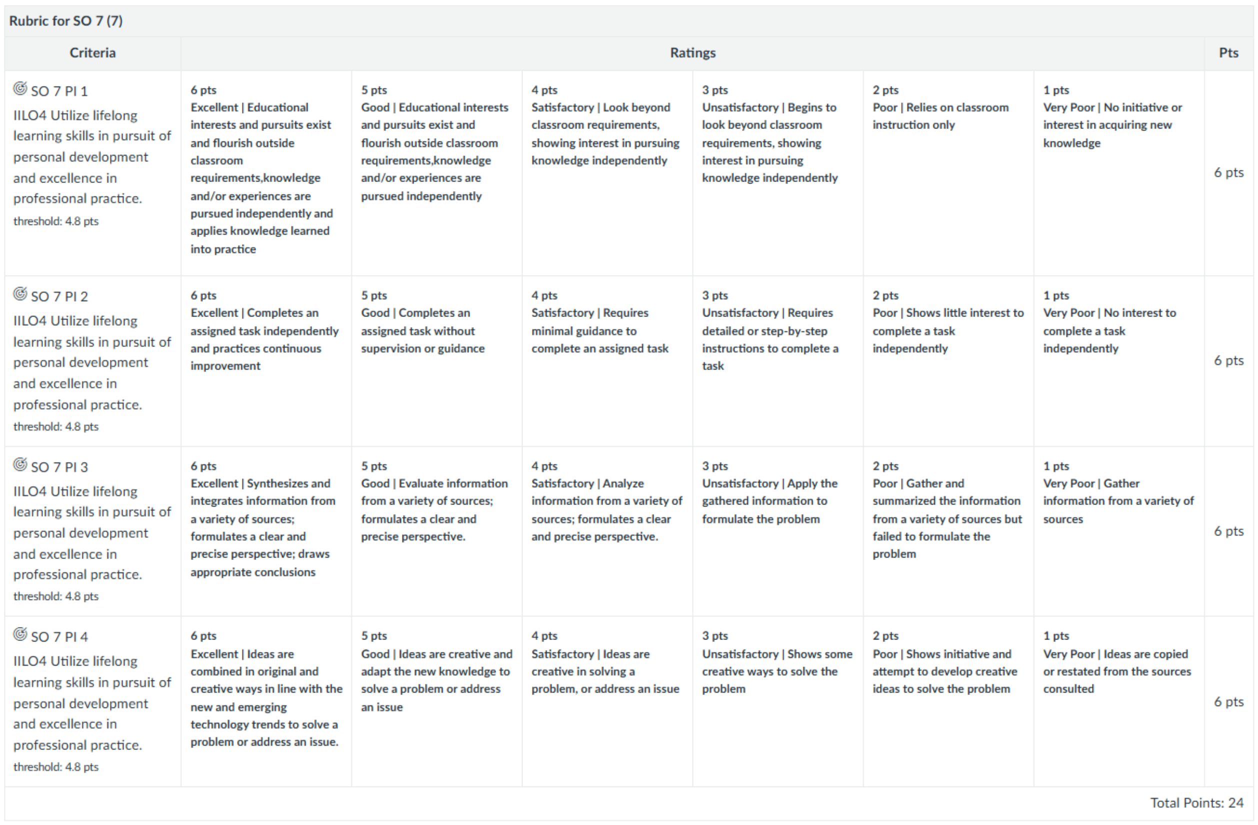
Output

```
Enter a grade (-1 to end): -1
No grades were entered.


=== Code Execution Successful ===
```

## Conclusion

The tasks were very difficult for me, I struggled A LOT with the operators and how they functioned, but I managed to pull through and complete the task that was given to me. I had a lot of trouble assigning things to one another, and I kept forgetting basic things like putting a semicolon at the end of the line, adding "std::" and many more. One of the most difficult tasks was the case study; figuring out and understanding how the "!" function works took me a long time, and the senior/student fair activity was also another task that made me confused because of the loops. Other than that, after hours of coding and trying to understand, I could say I have obtained newfound knowledge with this hands-on activity.

## Assessment Rubric



Rubric for SO 7 (7)

| Criteria | Ratings | | | | | | Pts |
|---|---|---|---|---|---|---|---|
| SO 7 PI 1<br>IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice.<br>threshold: 4.8 pts | 6 pts<br>Excellent \| Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently and applies knowledge learned into practice | 5 pts<br>Good \| Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently | 4 pts<br>Satisfactory \| Look beyond classroom requirements, showing interest in pursuing knowledge independently | 3 pts<br>Unsatisfactory \| Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently | 2 pts<br>Poor \| Relies on classroom instruction only | 1 pts<br>Very Poor \| No initiative or interest in acquiring new knowledge | 6 pts |
| SO 7 PI 2<br>IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice.<br>threshold: 4.8 pts | 6 pts<br>Excellent \| Completes an assigned task independently and practices continuous improvement | 5 pts<br>Good \| Completes an assigned task without supervision or guidance | 4 pts<br>Satisfactory \| Requires minimal guidance to complete an assigned task | 3 pts<br>Unsatisfactory \| Requires detailed or step-by-step instructions to complete a task | 2 pts<br>Poor \| Shows little interest to complete a task independently | 1 pts<br>Very Poor \| No interest to complete a task independently | 6 pts |
| SO 7 PI 3<br>IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice.<br>threshold: 4.8 pts | 6 pts<br>Excellent \| Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions | 5 pts<br>Good \| Evaluate information from a variety of sources; formulates a clear and precise perspective. | 4 pts<br>Satisfactory \| Analyze information from a variety of sources; formulates a clear and precise perspective. | 3 pts<br>Unsatisfactory \| Apply the gathered information to formulate the problem | 2 pts<br>Poor \| Gather and summarized the information from a variety of sources but failed to formulate the problem | 1 pts<br>Very Poor \| Gather information from a variety of sources | 6 pts |
| SO 7 PI 4<br>IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice.<br>threshold: 4.8 pts | 6 pts<br>Excellent \| Ideas are combined in original and creative ways in line with the new and emerging technology trends to solve a problem or address an issue. | 5 pts<br>Good \| Ideas are creative and adapt the new knowledge to solve a problem or address an issue | 4 pts<br>Satisfactory \| Ideas are creative in solving a problem, or address an issue | 3 pts<br>Unsatisfactory \| Shows some creative ways to solve the problem | 2 pts<br>Poor \| Shows initiative and attempt to develop creative ideas to solve the problem | 1 pts<br>Very Poor \| Ideas are copied or restated from the sources consulted | 6 pts |

Total Points: 24