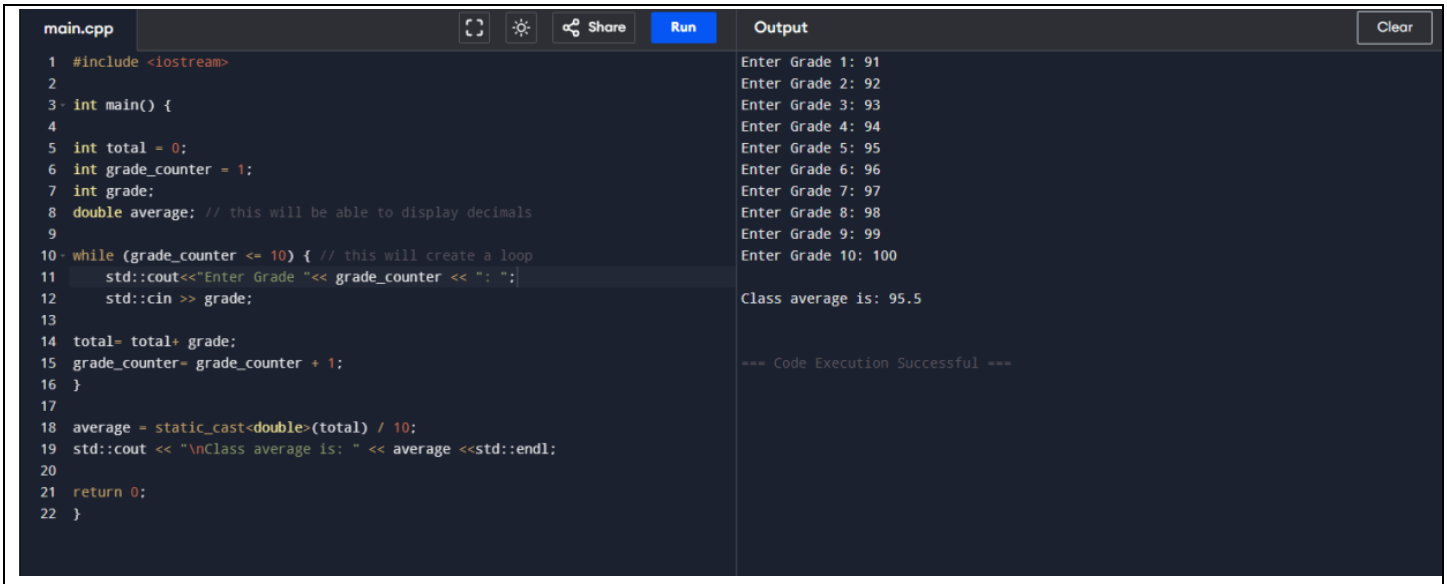
Activity No. <n>	
<Replace with Title>	
Course Code: CPE010	**Program:** Computer Engineering
Course Title: Data Structures and Algorithms	**Date Performed: 08/07/2025**
Section: CPE11S1	**Date Submitted: 08/12/25**
Name(s): Nieles, Cenndy M.	**Instructor: Engr. Jimlord Quejado**

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

```
#include <iostream>

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;
```

Results:

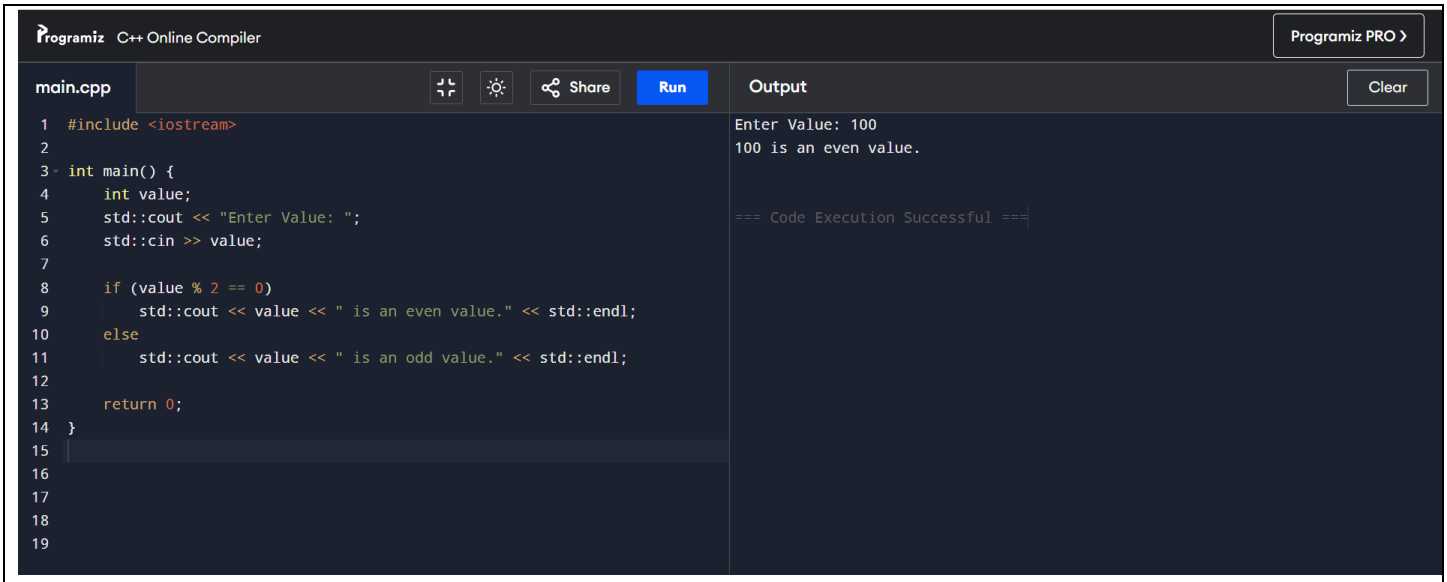


7. Supplementary Activity

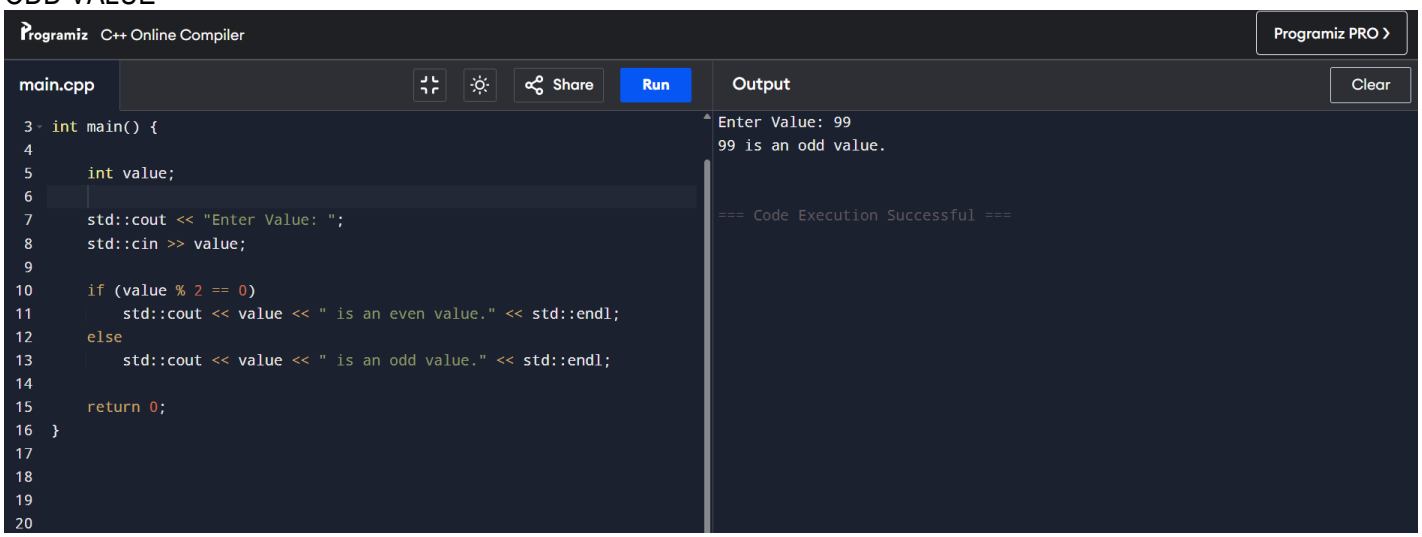
Using conditional statements (if-else statements), write a program that asks a user for a number and prints out if it is an even or an odd number.

```
#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



ODD VALUE



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

int main() {

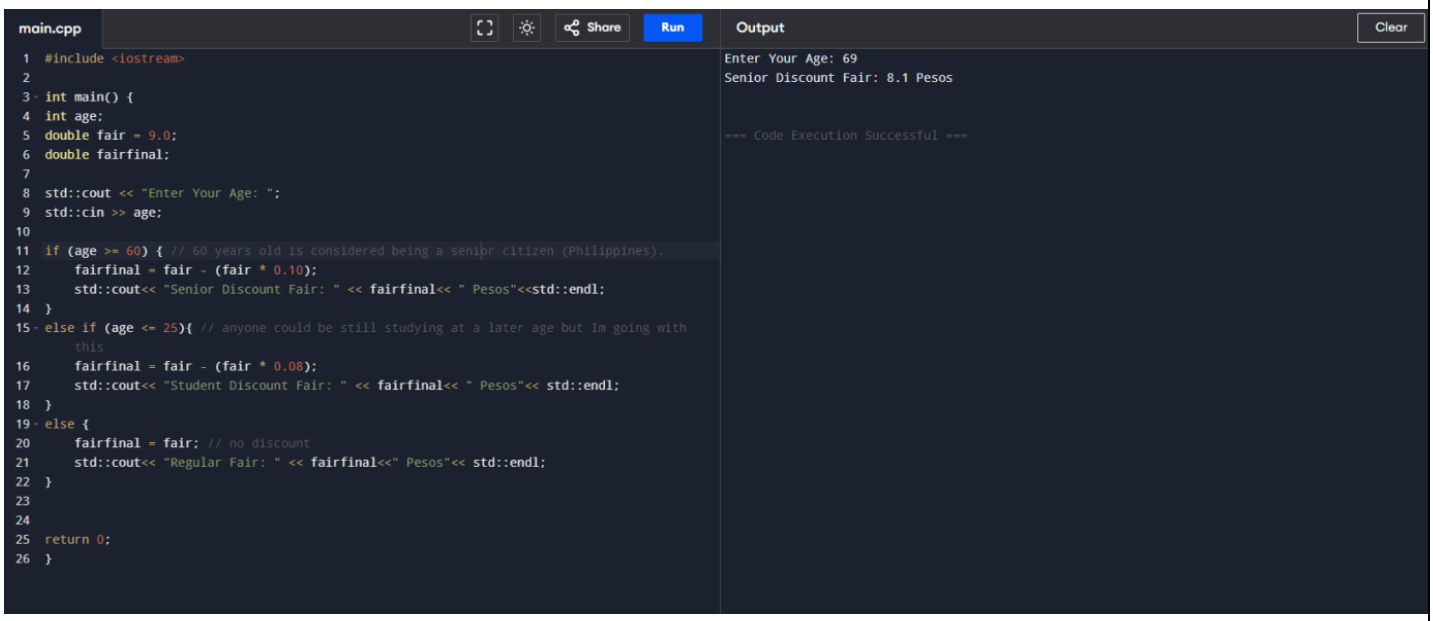
int age;

double fair = 9.0; double fairfinal;

std::cout << "Enter Your Age: ";

std::cin >> age;

```
if (age >= 60) { // 60 years old is considered being a senior citizen (Philippines).

fairfinal = fair - (fair * 0.10);

std::cout<<"Senior Discount Fair." <<fairfinal<< "Pesos"<<std::endl;

}

else if ( age <=25) { // anyone could be still studying at a later age but im going with this

fairfinal = fair - (fair * 0.08);

 std::cout<< "Student Discount Fair: " << fairfinal<< " Pesos"<< std::endl;

}

else { fairfinal = fair; // no discount

std::cout<< "Regular Fair: " << fairfinal<<" Pesos"<< std::endl;

 }

 return 0;
```



main.cpp

Share | Run

```cpp
#include <iostream>

int main() {
int age;
double fair = 9.0;
double fairfinal;

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

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


return 0;
}
```

Output | Clear

```
Enter Your Age: 12
Student Discount Fair: 8.28 Pesos


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

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main.cpp

Share | Run

```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 consider being a senior citizen (Philippines).
        fareFinal = fare * 0.10;
        std::cout << "Senior Discount Fare: " << fareFinal << " Pesos"
            << std::endl;
    }
    else if (age <= 25) { // any one could be still studying at a later age but im going with this
        fareFinal = fare * 0.50;
```

Output | Clear

```
Enter Your Age: 12
Student Discount Fare: 4.5 Pesos


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

main.cpp

```cpp
#include <iostream>

int main() {
int age;
double fair = 9.0;
double fairfinal;

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

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


return 0;
}
```

Output

```
Enter Your Age: 30
Regular Fair: 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.

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:

#include 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(total) / counter;
 std::cout << "Class average is " << average << std::endl;
 } else {
std::cout << "No grades were entered." << std::endl;

}

 Return 0;

}
```

main.cpp

Share Run

```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 Clear

```
Enter a grade (-1 to end): 99
Enter a grade (-1 to end): 88
Enter a grade (-1 to end): 96
Enter a grade (-1 to end): 88
Enter a grade (-1 to end): 98
Enter a grade (-1 to end): -1
Class average is 93.8


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

8. Conclusion:

Understand and use conditions and conditional executions with the if/*else* selection structure. Understand and use conditions and conditional executions with the *while* selection structure

9. Assessment Rubric

Rubric for SO 7 (7)

Criteria	Ratings						Pts
SO 7 PI 1 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts 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 Good | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently	4 pts Satisfactory | Look beyond classroom requirements, showing interest in pursuing knowledge independently	3 pts Unsatisfactory | Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently	2 pts Poor | Relies on classroom instruction only	1 pts Very Poor | No initiative or interest in acquiring new knowledge	6 pts
SO 7 PI 2 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Completes an assigned task independently and practices continuous improvement	5 pts Good | Completes an assigned task without supervision or guidance	4 pts Satisfactory | Requires minimal guidance to complete an assigned task	3 pts Unsatisfactory | Requires detailed or step-by-step instructions to complete a task	2 pts Poor | Shows little interest to complete a task independently	1 pts Very Poor | No interest to complete a task independently	6 pts
SO 7 PI 3 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions	5 pts Good | Evaluate information from a variety of sources; formulates a clear and precise perspective.	4 pts Satisfactory | Analyze information from a variety of sources; formulates a clear and precise perspective.	3 pts Unsatisfactory | Apply the gathered information to formulate the problem	2 pts Poor | Gather and summarized the information from a variety of sources but failed to formulate the problem	1 pts Very Poor | Gather information from a variety of sources	6 pts
SO 7 PI 4 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts 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 Good | Ideas are creative and adapt the new knowledge to solve a problem or address an issue	4 pts Satisfactory | Ideas are creative in solving a problem, or address an issue	3 pts Unsatisfactory | Shows some creative ways to solve the problem	2 pts Poor | Shows initiative and attempt to develop creative ideas to solve the problem	1 pts Very Poor | Ideas are copied or restated from the sources consulted	6 pts
							Total Points: 24