

Lab Report: 02

1. Write a program that determines if a person is eligible to vote based on their age (e.g., 18 years or older) using logical operators.

Input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int age;
```

```
    cout << "Enter your age: ";
```

```
    cin >> age;
```

```
    if (age >= 18) {
```

```
        cout << "You are eligible to vote. Go ahead and cast your vote!" << endl;
```

```
    } else {
```

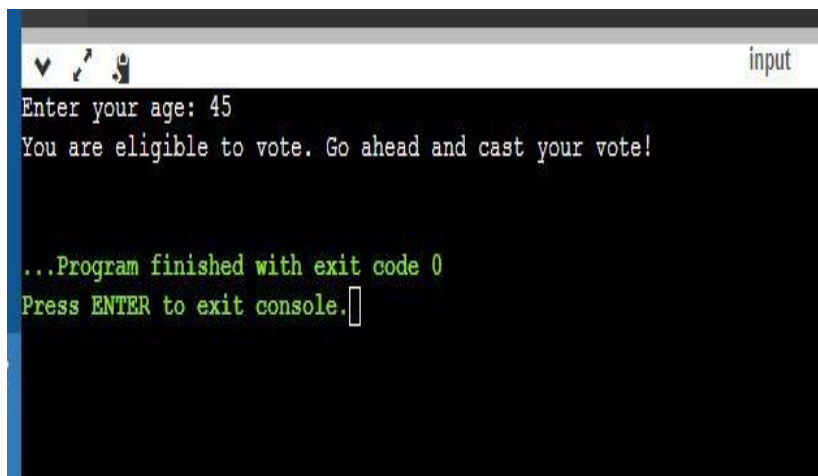
```
        cout << "Sorry, you are not eligible to vote yet. Wait until you are 18 or older." << endl;
```

```
    }
```

```
    return 0;
```

```
}
```

Output

A screenshot of a terminal window with a dark background. The title bar at the top shows a standard Linux window icon and the text 'input'. The terminal content shows the program's execution: 'Enter your age: 45' followed by 'You are eligible to vote. Go ahead and cast your vote!'. Below this, in green text, it says '...Program finished with exit code 0' and 'Press ENTER to exit console.' with a cursor at the end.

```
input
Enter your age: 45
You are eligible to vote. Go ahead and cast your vote!

...Program finished with exit code 0
Press ENTER to exit console.
```

2. Write a program that takes an integer as input and checks if it falls within the range [10, 50] using logical operators.

Input

```
#include <iostream>

using namespace std;

int main() {

    int number;

    cout << "Enter an integer: ";

    cin >> number;

    if (number >= 10 && number <= 50) {

        cout << "The number is within the range [10, 50]." << endl;

    } else {

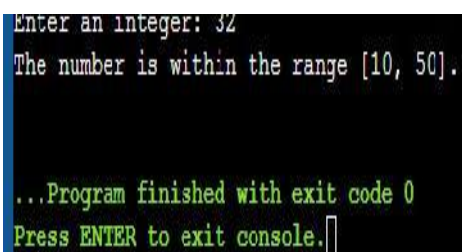
        cout << "The number is outside the range [10, 50]." << endl;

    }

    return 0;

}
```

Output

A screenshot of a terminal window with a black background and white text. The text shows the program's execution: it prompts for an integer, receives '32', and outputs that the number is within the range [10, 50]. It then shows the program finishing with exit code 0 and a prompt to press ENTER to exit the console.

```
Enter an integer: 32
The number is within the range [10, 50].

...Program finished with exit code 0
Press ENTER to exit console.
```

3. Write a C++ program to compare two integers and find the maximum value.

Input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int num1, num2;
```

```
    cout << "Enter the first integer: ";
```

```
    cin >> num1;
```

```
    cout << "Enter the second integer: ";
```

```
    cin >> num2;
```

```
    if (num1 > num2) {
```

```
        cout << "The maximum value is: " << num1 << endl;
```

```
    } else if (num2 > num1) {
```

```
        cout << "The maximum value is: " << num2 << endl;
```

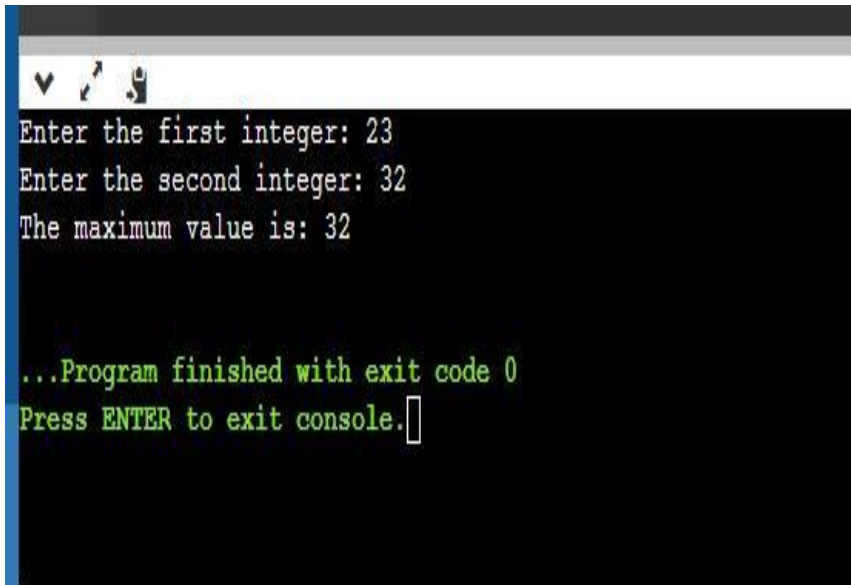
```
    } else {
```

```
        cout << "Both integers are equal." << endl;
```

```
    }
```

```
    return 0;
}
```

Output

A screenshot of a console window with a black background and white text. The text shows the program's execution: it prompts for the first integer (23) and the second integer (32), then outputs the maximum value (32). At the bottom, it shows the program finished with exit code 0 and prompts the user to press ENTER to exit the console.

```
Enter the first integer: 23
Enter the second integer: 32
The maximum value is: 32

...Program finished with exit code 0
Press ENTER to exit console.
```

4. Write a C++ program to calculate the average of three exam scores and determine if it's above a passing grade (e.g., average ≥ 60).

Input

```
#include <iostream>

using namespace std;
```

```
int main() {

    double score1, score2, score3;

    double average;
```

```
cout << "Enter the first exam score: ";  
  
cin >> score1;  
  
cout << "Enter the second exam score: ";  
  
cin >> score2;  
  
cout << "Enter the third exam score: ";  
  
cin >> score3;  
  
average = (score1 + score2 + score3) / 3.0; // Calculate the average  
  
cout << "The average exam score is: " << average << endl;  
  
if (average >= 60) {  
    cout << "Congratulations! You passed." << endl;  
} else {  
    cout << "Sorry, you did not pass." << endl;  
}  
  
return 0;  
}
```

Output

```
29
input
Enter the first exam score: 75
Enter the second exam score: 85
Enter the third exam score: 99
The average exam score is: 86.3333
Congratulations! You passed.

...Program finished with exit code 0
Press ENTER to exit console.
```

Home Task:

1. Create a program that takes a student's score as input and assigns a grade based on

Predefined criteria using logical operators (e.g., A, B, C, D, and F).

A-Grade: 90-100 Marks

B-Grade: 75-90 Marks

C-Grade: 60-75 Marks

D-Grade: 45-60 Marks

F-Grade: 0-45 Marks

Input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int score;
```

```
    char grade;
```

```
    cout << "Enter the student's score: ";
```

```
    cin >> score;
```

```
    if (score >= 90 && score <= 100) {
```

```

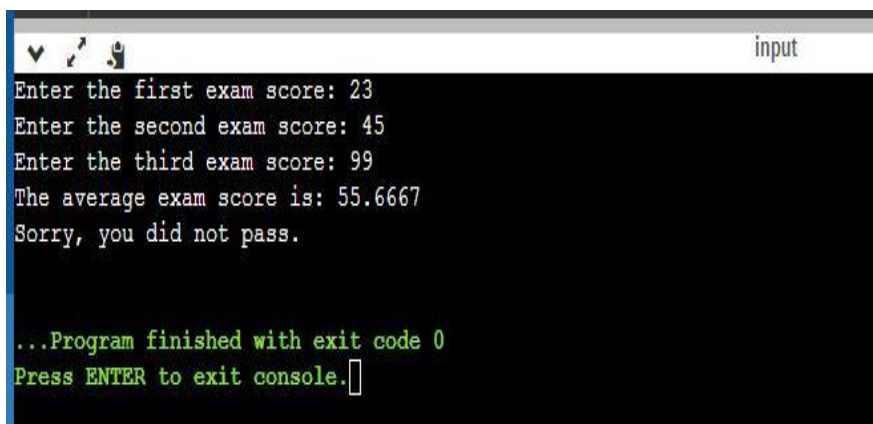
        grade = 'A';
    } else if (score >= 75 && score < 90) {
        grade = 'B';
    } else if (score >= 60 && score < 75) {
        grade = 'C';
    } else if (score >= 45 && score < 60) {
        grade = 'D';
    } else if (score >= 0 && score < 45) {
        grade = 'F';
    } else {
        cout << "Invalid score. Please enter a score between 0 and 100." << endl;
        return 1; // Exit the program with an error code
    }

    cout << "The student's grade is: " << grade << endl;

    return 0;
}

```

Output



A screenshot of a terminal window titled 'input'. The window has a dark background with light-colored text. The output shows the user entering three exam scores: 23, 45, and 99. The program calculates the average score as 55.6667 and outputs 'Sorry, you did not pass.' at the bottom, followed by a green prompt to press ENTER to exit the console.

```

input
Enter the first exam score: 23
Enter the second exam score: 45
Enter the third exam score: 99
The average exam score is: 55.6667
Sorry, you did not pass.

...Program finished with exit code 0
Press ENTER to exit console.

```

2. Write a program that takes an integer as input and determines if it is both even and divisible by 5.

Input

```
#include <iostream>

using namespace std;

int main() {

    int number;

    cout << "Enter an integer: ";

    cin >> number;

    if (number % 2 == 0 && number % 5 == 0) {

        cout << "The number is even and divisible by 5." << endl;

    } else {

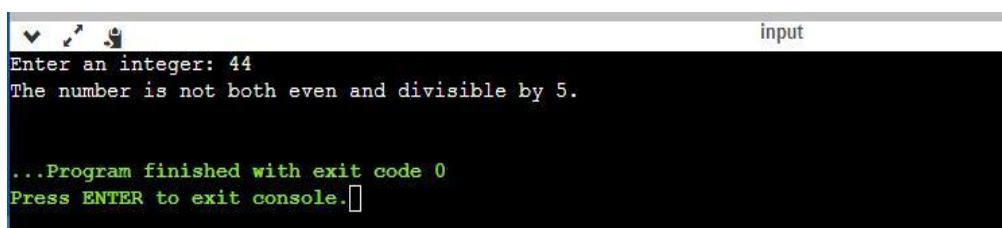
        cout << "The number is not both even and divisible by 5." << endl;

    }

    return 0;

}
```

Output

A screenshot of a terminal window titled 'input'. The terminal has a black background with white text. It shows the program's execution: 'Enter an integer: 44' followed by 'The number is not both even and divisible by 5.' At the bottom, it says '...Program finished with exit code 0' and 'Press ENTER to exit console.' with a cursor.

```
input
Enter an integer: 44
The number is not both even and divisible by 5.

...Program finished with exit code 0
Press ENTER to exit console.
```


3. Create a C++ program that checks if a user-provided year is a leap year.

Input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int number;
```

```
    cout << "Enter an integer: ";
```

```
    cin >> number;
```

```
    if (number % 2 == 0 && number % 5 == 0) {
```

```
        cout << "The number is even and divisible by 5." << endl;
```

```
    } else {
```

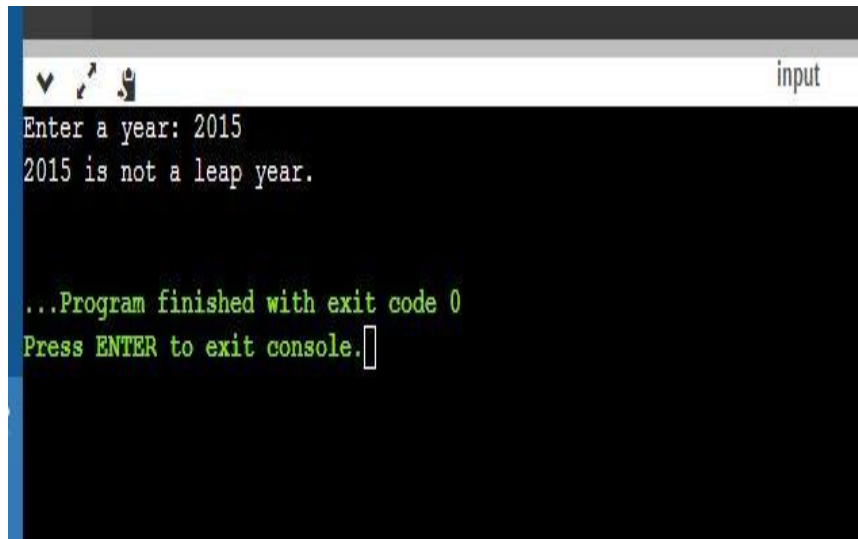
```
        cout << "The number is not both even and divisible by 5." << endl;
```

```
    }
```

```
    return 0;
```

```
}
```

Output



```
input
Enter a year: 2015
2015 is not a leap year.

...Program finished with exit code 0
Press ENTER to exit console.
```

4. Create a C++ program that determines if a student is eligible for a scholarship based on their GPA (must have GPA ≥ 3.5) and attendance (must have attended at least 80% of classes).

Input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    double gpa;
```

```
    double attendancePercentage;
```

```
    cout << "Enter your GPA: ";
```

```
    cin >> gpa;
```

```
    cout << "Enter your attendance percentage: ";
```

```
    cin >> attendancePercentage;
```

```
    if (gpa  $\geq$  3.5 && attendancePercentage  $\geq$  80) {
```

```
        cout << "Congratulations! You are eligible for a scholarship." << endl;
```

```
    } else {
```

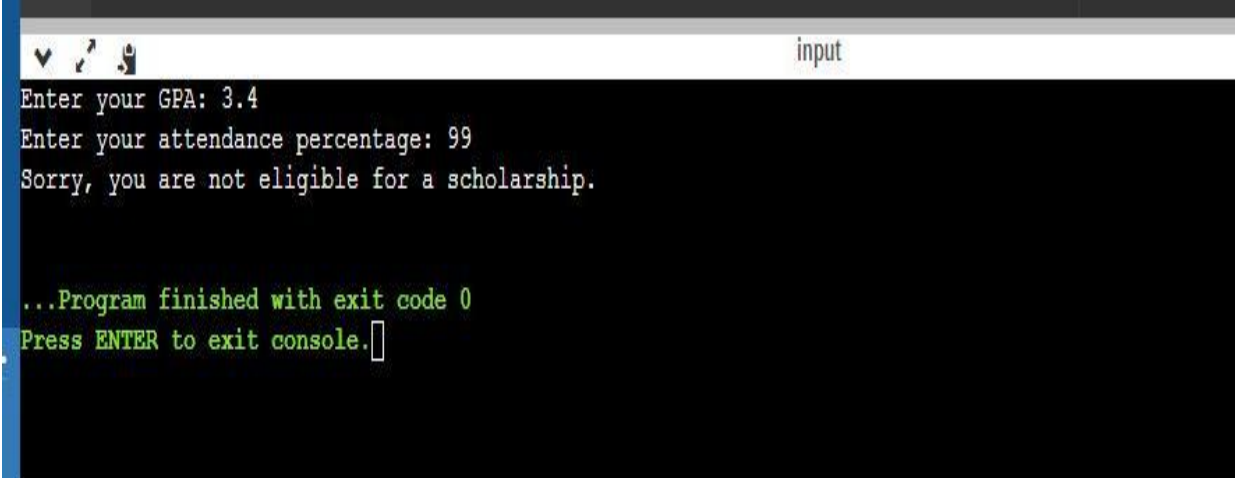
```
        cout << "Sorry, you are not eligible for a scholarship." << endl;
```

```
    }
```

```
    return 0;
```

```
}
```

Output

A screenshot of a console window titled 'input'. The window has a dark background with white text. The text inside the window reads: 'Enter your GPA: 3.4', 'Enter your attendance percentage: 99', 'Sorry, you are not eligible for a scholarship.', '...Program finished with exit code 0', and 'Press ENTER to exit console.' followed by a cursor. The window has standard OS window controls (minimize, maximize, close) in the top-left corner.

```
input
Enter your GPA: 3.4
Enter your attendance percentage: 99
Sorry, you are not eligible for a scholarship.

...Program finished with exit code 0
Press ENTER to exit console.
```

5. Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.

Input

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    char character;
```

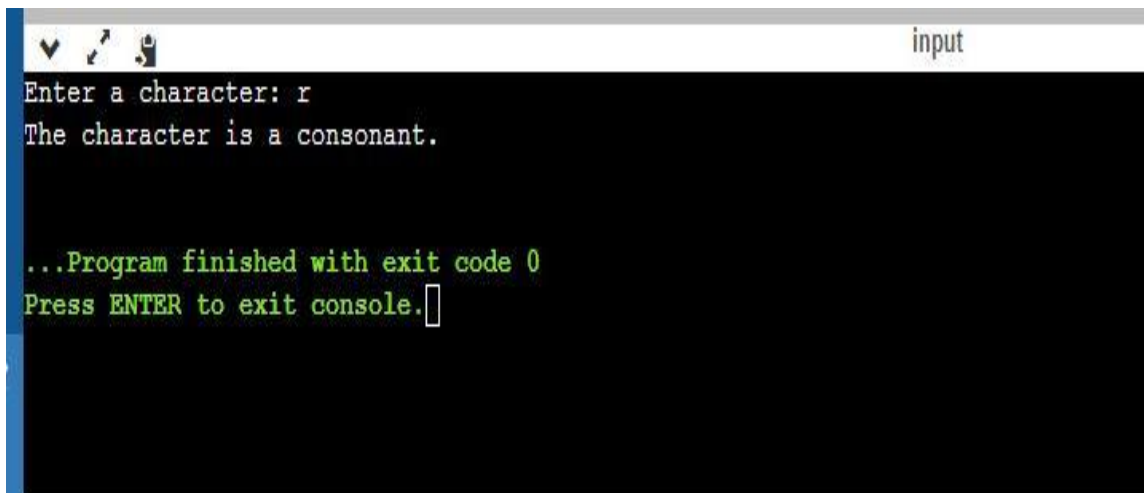
```
    cout << "Enter a character: ";
```

```
cin >> character;

if (character == 'a' || character == 'e' || character == 'i' || character == 'o' || character == 'u' ||
    character == 'A' || character == 'E' || character == 'T' || character == 'O' || character == 'U') {
    cout << "The character is a vowel." << endl;
} else {
    cout << "The character is a consonant." << endl;
}

return 0;
}
```

Output

A screenshot of a console window with a dark background. The title bar at the top is light gray and contains the word "input" on the right. On the left side of the title bar are three small icons: a downward arrow, a magnifying glass, and a person icon. The console text is as follows: "Enter a character: r" (in white), "The character is a consonant." (in white), "...Program finished with exit code 0" (in green), and "Press ENTER to exit console." (in green) followed by a white cursor box.

```
input
Enter a character: r
The character is a consonant.
...Program finished with exit code 0
Press ENTER to exit console.
```