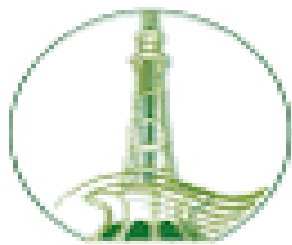


ASSIGNMENT

AICT

1-(O)



**THE
UNIVERSITY OF
LAHORE**

SUBMITTED BY: MUHAMMAD ARHAM AMIR

SUBMITTED TO: LECTURER SALMAN IRFAN

LAB TASK 7

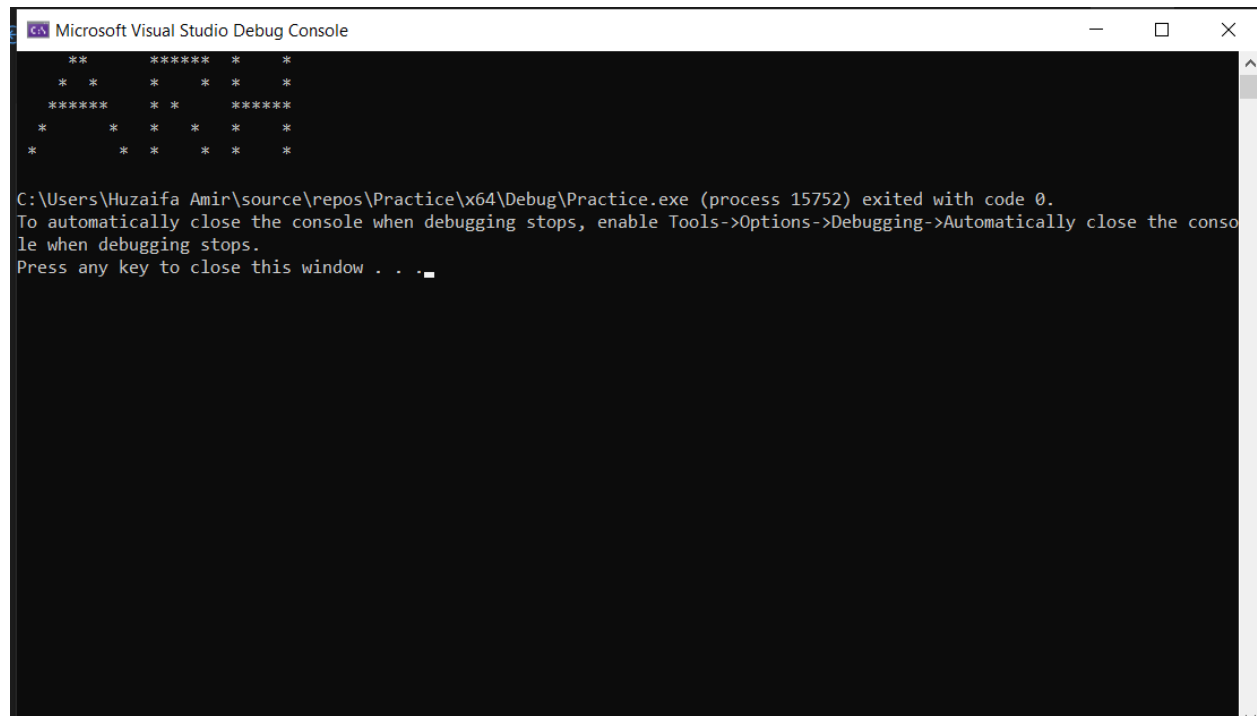
QUESTION NO 1: Write a program to display your name with stars.

```
#include<iostream>
using namespace std;
int main() {

    cout << "  **  *****  *  " << endl;
    cout << " * *  *  *  *  *  " << endl;
    cout << " *****  *  *****  " << endl;
    cout << " *  *  *  *  *  *  " << endl;
    cout << " *  *  *  *  *  *  " << endl;

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console

  **  *****  *  
 * *  *  *  *  *  
 *****  *  *****  
 *  *  *  *  *  *  
 *  *  *  *  *  *  

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 15752) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 2: In this task, students will create a simple C++ program to print a student's profile information.

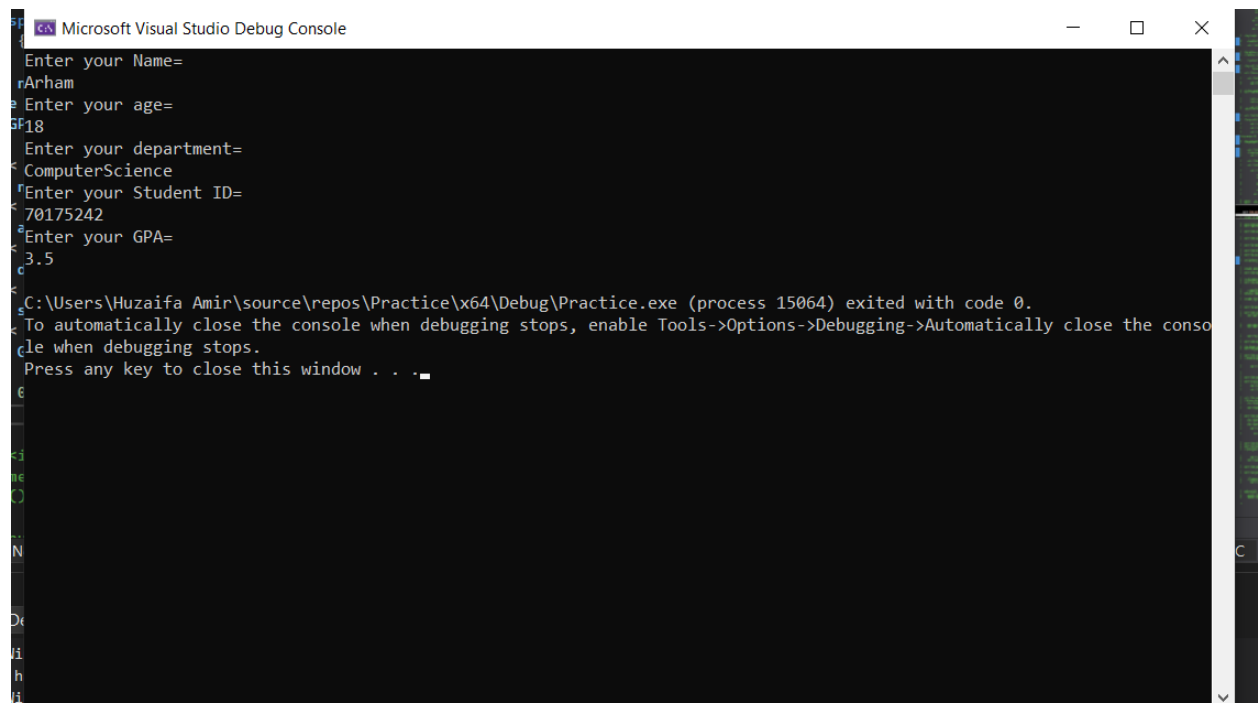
```
#include<iostream>
using namespace std;
int main() {

    string name, department;
    int age = 0, studentID = 0;
    float GPA = 0.0;

    cout << "Enter your Name=" << endl;
    cin >> name;
    cout << "Enter your age=" << endl;
    cin >> age;
    cout << "Enter your department=" << endl;
    cin >> department;
    cout << "Enter your Student ID=" << endl;
    cin >> studentID;
    cout << "Enter your GPA=" << endl;
    cin >> GPA;

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console

Enter your Name=
Arham
Enter your age=
18
Enter your department=
ComputerScience
Enter your Student ID=
70175242
Enter your GPA=
3.5

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 15064) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

LAB TASK 8

QUESTION NO 1: Write a program to store two numbers in memory and sum them

Algorithm:

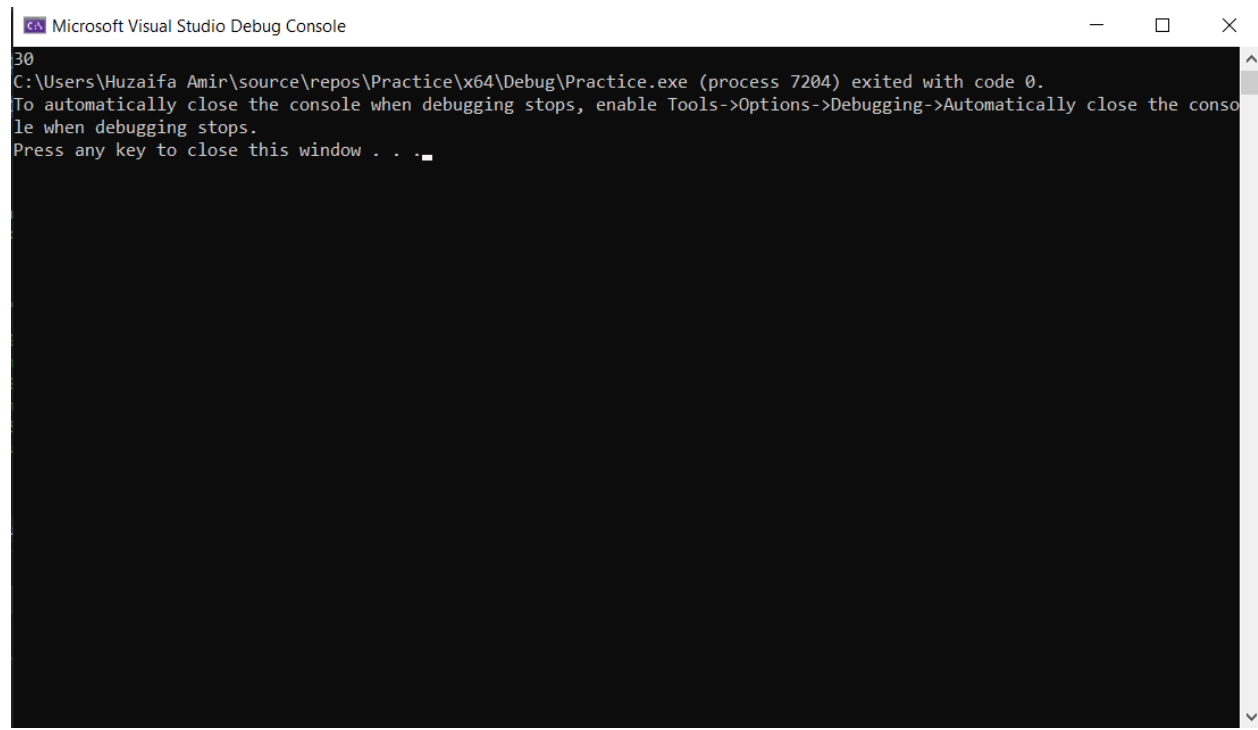
```
#include<iostream>
using namespace std;
int main() {

    int num1 = 10, num2 = 20;

    cout << num1 + num2;

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console
30
C:\Users\Huzaiifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 7204) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 2: Write a program to take two numbers from user and sum them

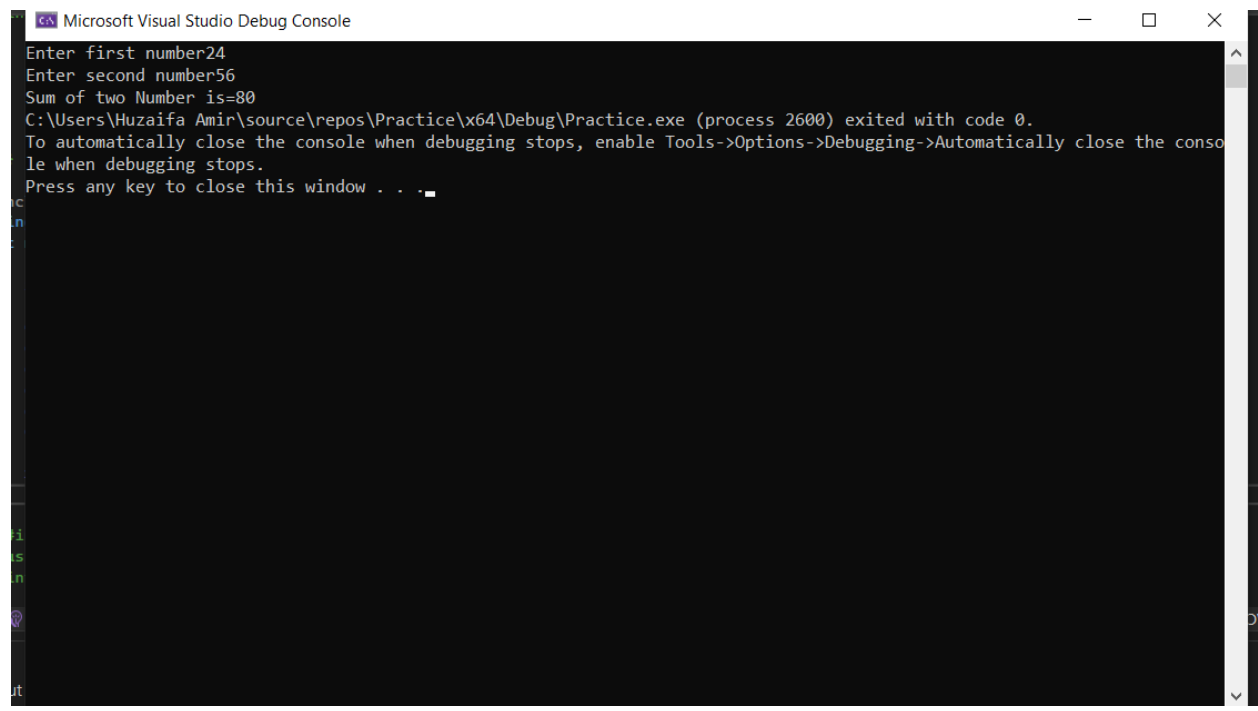
```
#include<iostream>
using namespace std;
int main() {

    int num1 , num2 ;

    cout << "Enter first number";
    cin >> num1;
    cout << "Enter second number";
    cin >> num2;
    cout << "Sum of two Number is=";
    cout << num1 + num2;

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console
Enter first number24
Enter second number56
Sum of two Number is=80
C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 2600) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

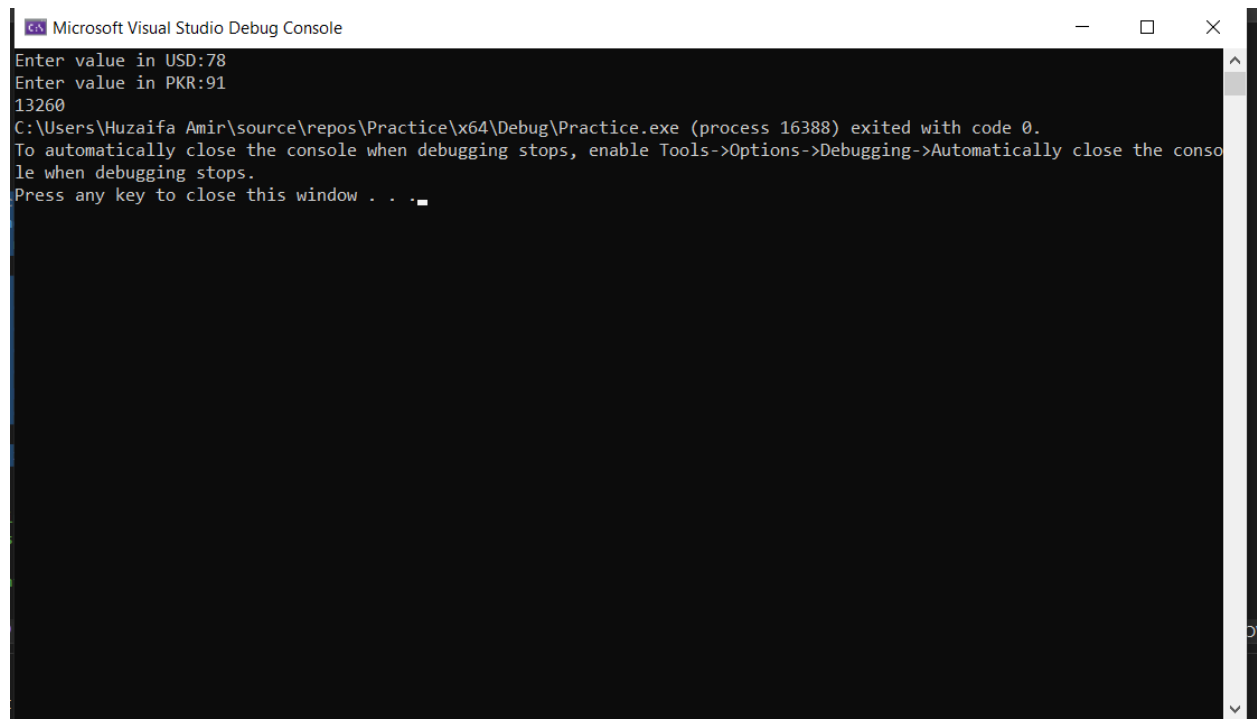
QUESTION NO 3: Write a program that convert USD to PKR

```
#include<iostream>
using namespace std;
int main() {

    int usd, pkr;
    cout << "Enter value in USD:";
    cin >> usd;
    cout << "Enter value in PKR:";
    cin >> pkr;
    pkr = usd * 170;
    cout << pkr;

    return 0;
}
```

Compilation of the code:

A screenshot of the Microsoft Visual Studio Debug Console window. The window title is "Microsoft Visual Studio Debug Console". The console output shows the program's execution: "Enter value in USD:78", "Enter value in PKR:91", and "13260". Below this, a message states: "C:\Users\Huzaiifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 16388) exited with code 0." followed by instructions: "To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops." and "Press any key to close this window . . .". The console has a dark background and a vertical scrollbar on the right side.

```
Microsoft Visual Studio Debug Console
Enter value in USD:78
Enter value in PKR:91
13260
C:\Users\Huzaiifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 16388) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 4: show the output on the console: $(a * (b + c)) + (c * (a + c))$

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

int main() {
    int MA1, MA2, MA3;

    cout << "Enter value for a: ";
    cin >> MA1;

    cout << "Enter value for b: ";
    cin >> MA2;

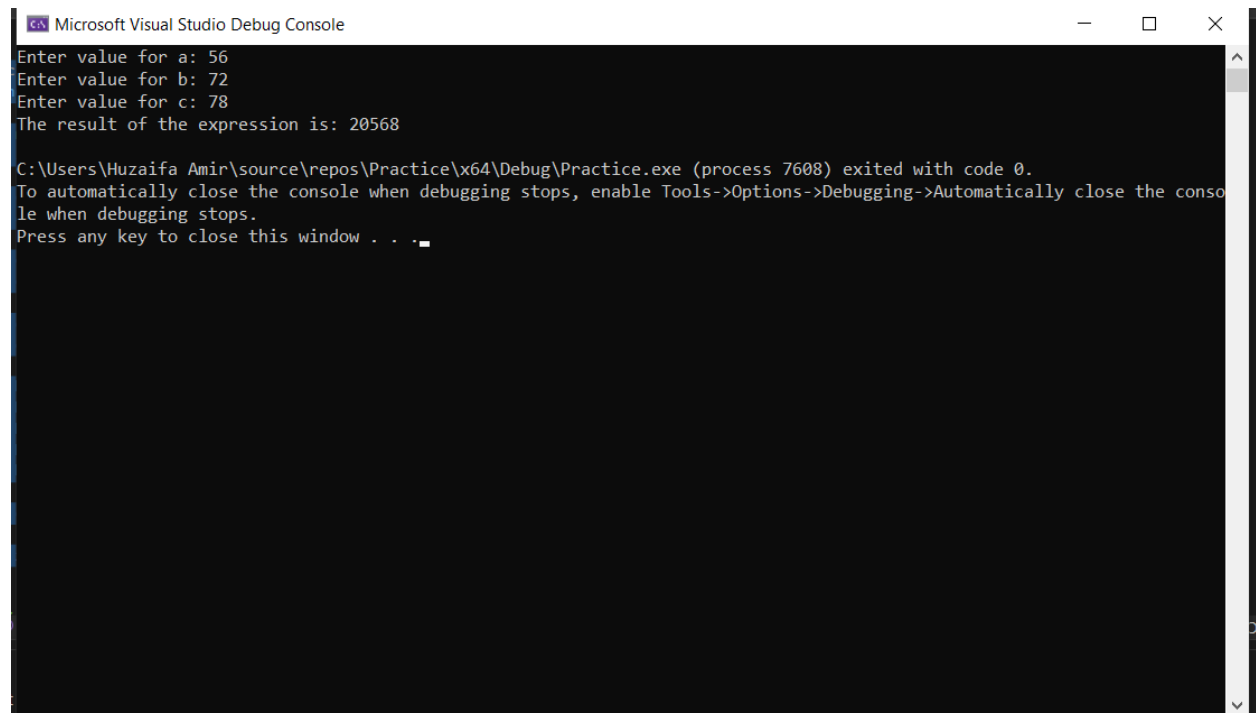
    cout << "Enter value for c: ";
    cin >> MA3;

    MA2 = MA2 + MA3;
    MA1 = MA1 * MA2;
    MA2 = MA3 + MA3;
    MA3 = MA3 * MA2;
    MA1 = MA1 + MA3;

    cout << "The result of the expression is: " << MA1 << endl;

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console

Enter value for a: 56
Enter value for b: 72
Enter value for c: 78
The result of the expression is: 20568

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 7608) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 5: Formula to calculate the Area

Area (feet²) = Length (feet) * Width (feet)

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

int main() {
    int length, width, area;

    cout << "Enter the length of the rectangular fence: ";
    cin >> length;

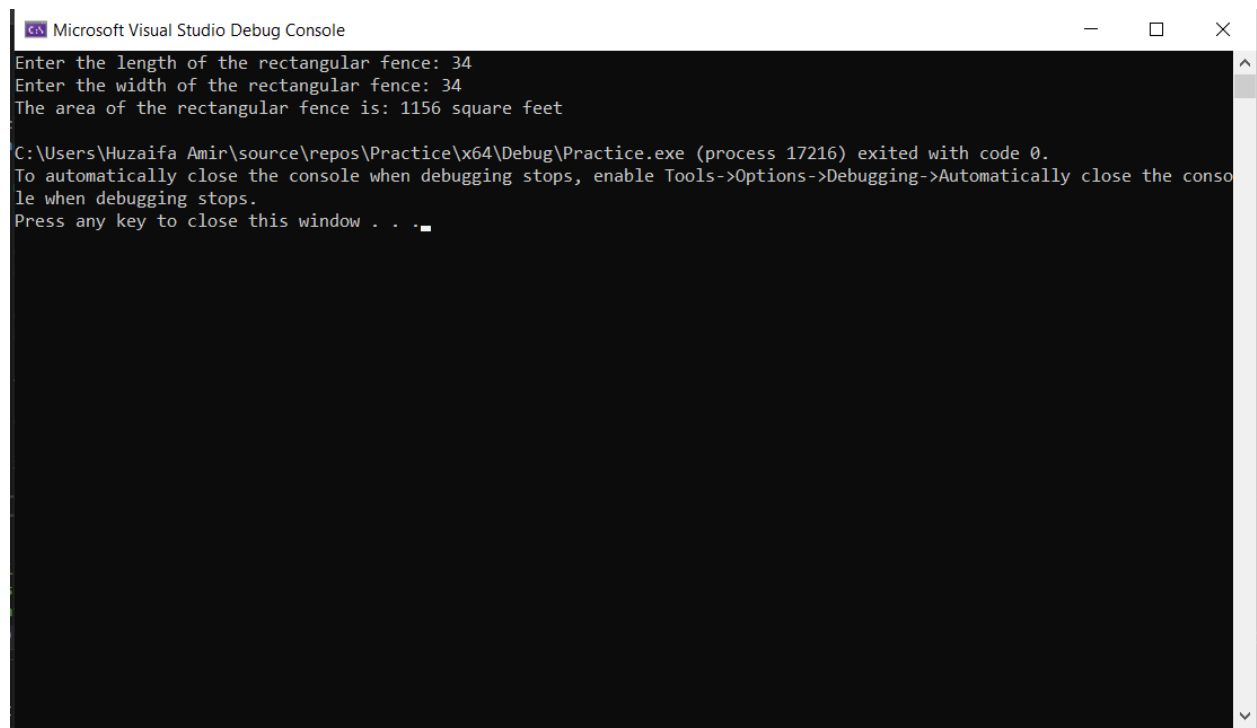
    cout << "Enter the width of the rectangular fence: ";
    cin >> width;

    area = length * width;

    cout << "The area of the rectangular fence is: " << area << " square feet" << endl;

    return 0;
}
```

Compilation of the code:



The screenshot shows the Microsoft Visual Studio Debug Console window. The output of the program is as follows:

```
Enter the length of the rectangular fence: 34
Enter the width of the rectangular fence: 34
The area of the rectangular fence is: 1156 square feet

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 17216) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 6: Formula to Calculate the Acceleration:

Acceleration = (Final velocity - Initial velocity) / Time

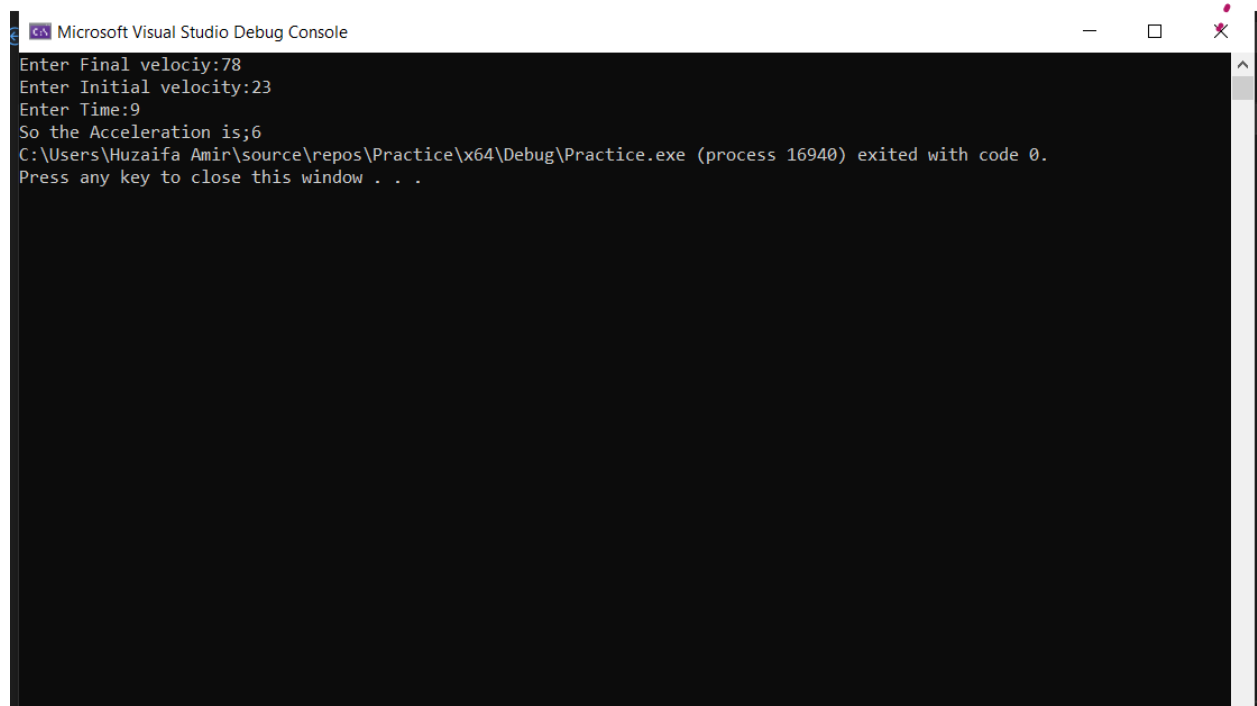
```
#include <iostream>
using namespace std;
int main() {

    int FinalVelocity, InitialVelocity, Time, acceleration;

    cout << "Enter Final velocity:";
    cin >> FinalVelocity;
    cout << "Enter Initial velocity:";
    cin >> InitialVelocity;
    cout << "Enter Time:";
    cin >> Time;
    cout << "So the Acceleration is:";
    acceleration = (FinalVelocity - InitialVelocity) / Time;
    cout<<acceleration;

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console
Enter Final velocity:78
Enter Initial velocity:23
Enter Time:9
So the Acceleration is:6
C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 16940) exited with code 0.
Press any key to close this window . . .
```

QUESTION NO 7: Show the student's name and total obtained percentage on the

Console.

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

int main() {
    string name;
    int marks1, marks2, marks3, marks4, marks5;
    int totalMarks = 500;
    float percentage;

    // Input the student's name
    cout << "Your Name: ";
    cin >> name;

    // Input marks for each subject
    cout << "Enter subject 1 marks: ";
    cin >> marks1;

    cout << "Enter subject 2 marks: ";
    cin >> marks2;

    cout << "Enter subject 3 marks: ";
    cin >> marks3;

    cout << "Enter subject 4 marks: ";
    cin >> marks4;

    cout << "Enter subject 5 marks: ";
    cin >> marks5;

    // Calculate total marks obtained and percentage
    int obtainedMarks = marks1 + marks2 + marks3 + marks4 + marks5;
    percentage =(obtainedMarks / totalMarks)* 100;

    // Display the result
    cout << "\nStudent's Name: " << name << endl;
    cout << "Total Marks Obtained: " << obtainedMarks << "/" << totalMarks << endl;
    cout << "Percentage: " << percentage << "%" << endl;

    return 0;
}
```

Compilation of the code:

```
Microsoft Visual Studio Debug Console

Your Name: Arham
Enter subject 1 marks: 89
Enter subject 2 marks: 91
Enter subject 3 marks: 90
Enter subject 4 marks: 85
Enter subject 5 marks: 82

Student's Name: Arham
Total Marks Obtained: 437/500
Percentage: 0%

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 5816) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 8: Write a program that takes 15 numbers from the user, it adds the first 5 numbers, multiplies the next 5 numbers, and subtract the next 5 numbers. After that it adds the first two results and subtracts the 3rd results and shows the final output on the monitor screen.

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

int main() {
    int numbers[15];
    int sum = 0, product = 1, subtraction = 0;

    cout<< "Enter 15 numbers:\n"

    cin >> numbers[0] >> numbers[1] >> numbers[2] >> numbers[3] >> numbers[4]
    >> numbers[5] >> numbers[6] >> numbers[7] >> numbers[8] >> numbers[9]
    >> numbers[10] >> numbers[11] >> numbers[12] >> numbers[13] >> numbers[14];

    sum = numbers[0] + numbers[1] + numbers[2] + numbers[3] + numbers[4];
```

```
product = numbers[5] * numbers[6] * numbers[7] * numbers[8] * numbers[9];
```

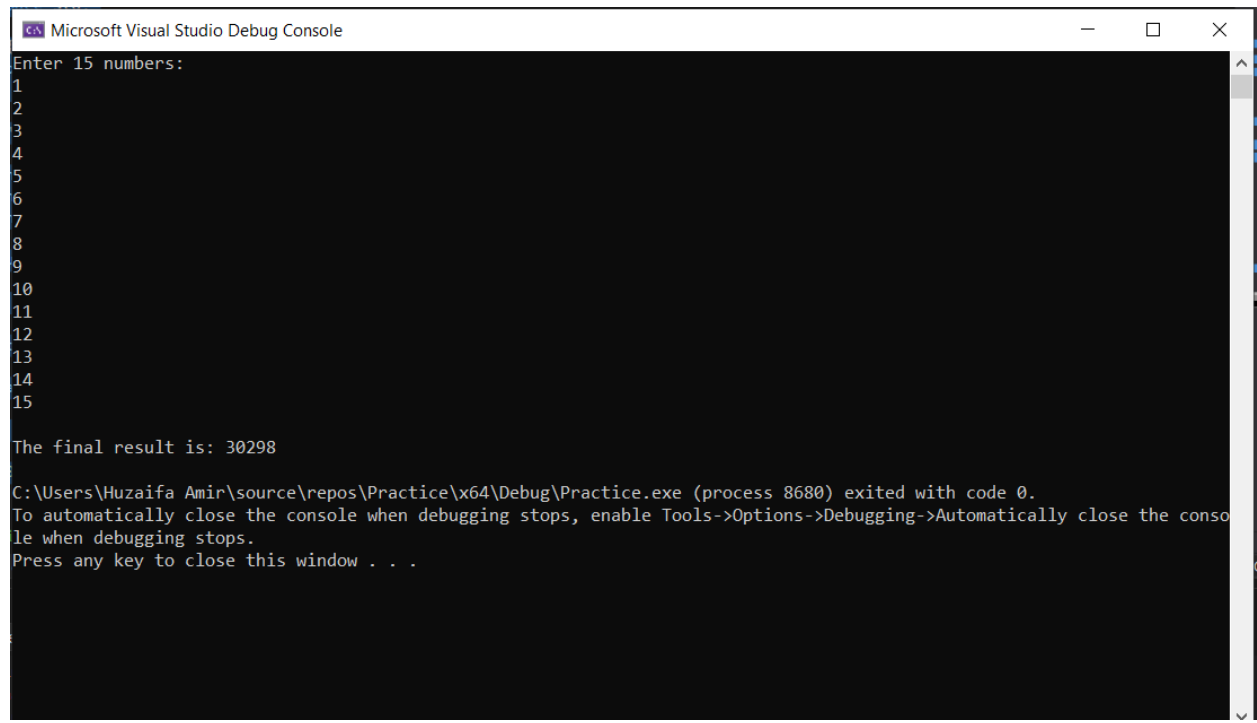
```
subtraction = numbers[10] - numbers[11] - numbers[12] - numbers[13] - numbers[14];
```

```
int final_result = (sum + product) - subtraction;
```

```
cout << "\nThe final result is: " << final_result << endl
```

```
return 0;
```

Compilation of the code:



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

```
Enter 15 numbers:
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

The final result is: 30298

C:\Users\Huzaiifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 8680) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 9: With the help of a modulus operator, write a program that takes a 4 digit number from the user and sum individual digits.

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

int main() {
    int number, digit1, digit2, digit3, digit4, sum;

    cout << "Enter a 4-digit number: ";
    cin >> number;

    digit4 = number % 10;
    number = number / 10;

    digit3 = number % 10;
    number = number / 10;

    digit2 = number % 10;
    number = number / 10;

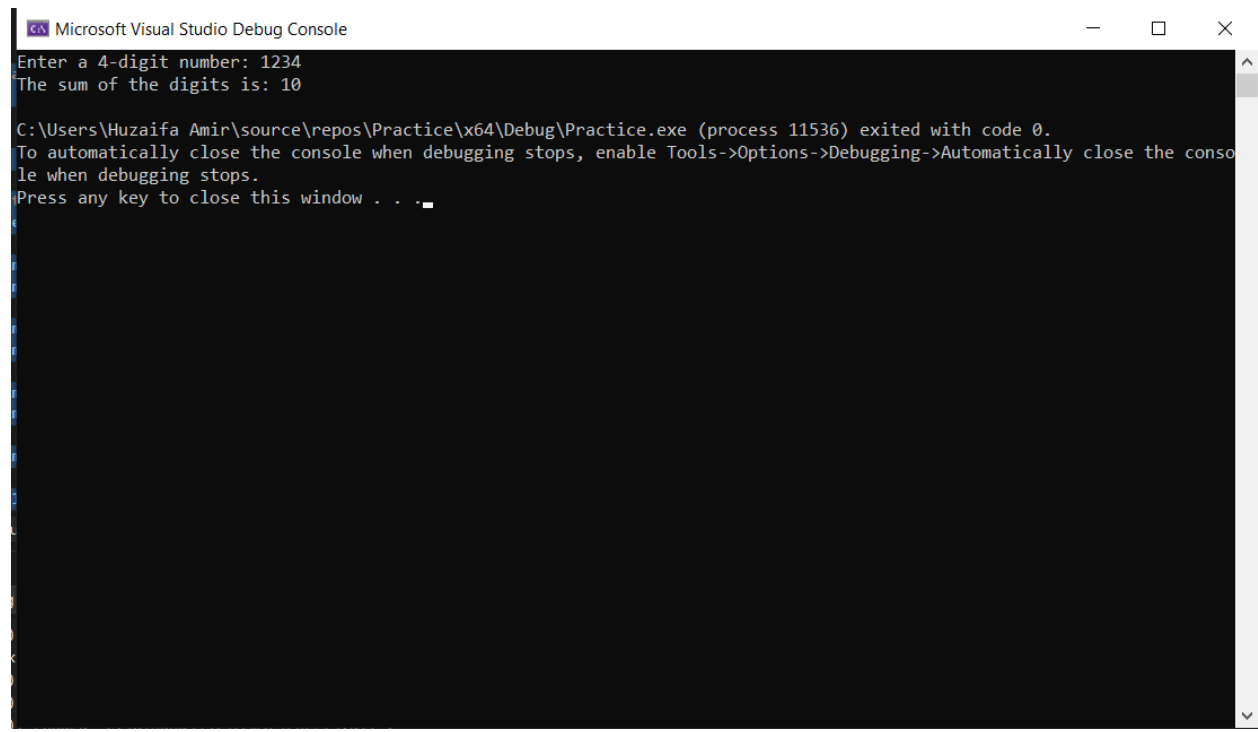
    digit1 = number % 10;

    sum = digit1 + digit2 + digit3 + digit4;

    cout << "The sum of the digits is: " << sum << endl;

    return 0;
}
```

Compilation of the code:

A screenshot of the Microsoft Visual Studio Debug Console window. The window has a title bar with the Visual Studio logo and the text "Microsoft Visual Studio Debug Console". It includes standard window controls (minimize, maximize, close) on the right. The console output shows: "Enter a 4-digit number: 1234", "The sum of the digits is: 10", and a message that the program "C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 11536) exited with code 0." It also provides instructions on how to automatically close the console when debugging stops and prompts the user to press any key to close the window. A vertical scrollbar is visible on the right side of the console area.

```
Microsoft Visual Studio Debug Console
Enter a 4-digit number: 1234
The sum of the digits is: 10

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 11536) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 10: Take a number from the user and print its reverse number

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

int main() {
    int number, reversed_number = 0;

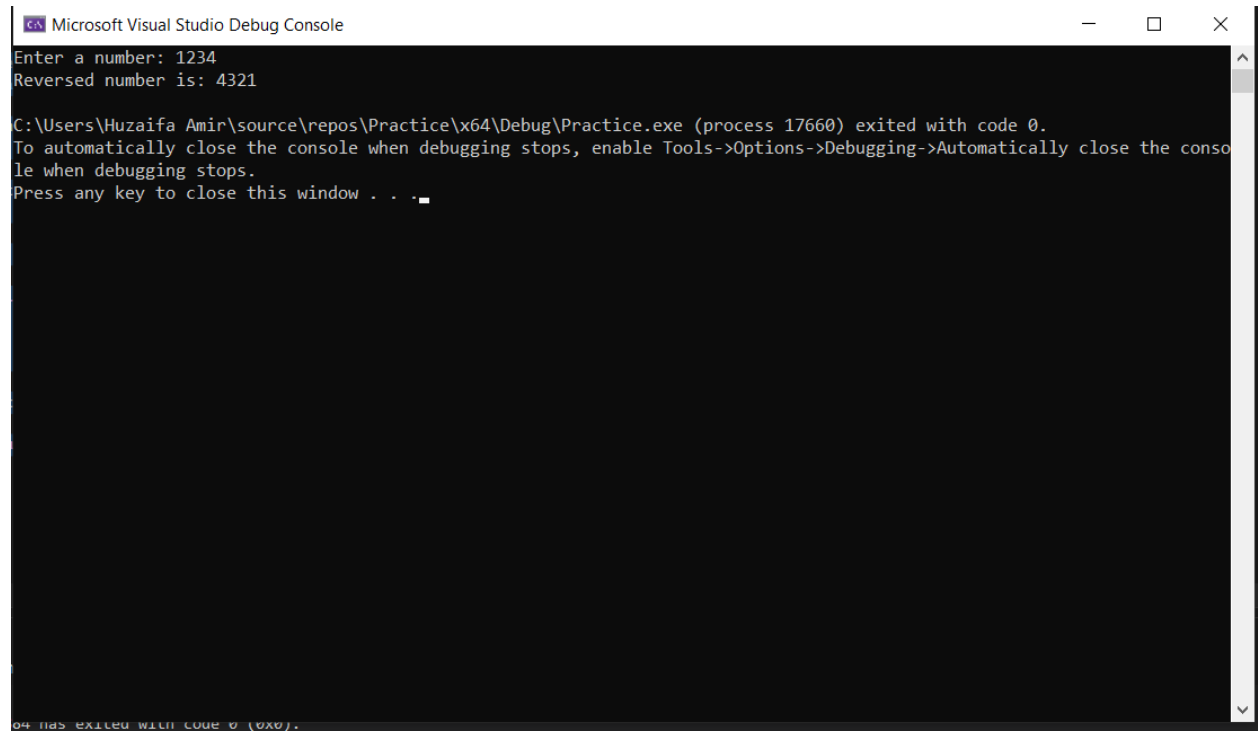
    cout << "Enter a number: ";
    cin >> number;

    int temp = number;

    while (temp > 0) {
        int last_digit = temp % 10;
        reversed_number = reversed_number * 10 + last_digit;
        temp /= 10;
    }
    cout << "Reversed number is: " << reversed_number << endl;

    return 0;
}
```

Compilation of the code:



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

```
Enter a number: 1234
Reversed number is: 4321

C:\Users\Huzaiifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 17660) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

At the bottom of the console, there is a status bar that reads "04 ms exited with code 0 (0x0)."

LAB TASK 9

QUESTION NO 1: Write a program that checks whether an integer is even or odd.

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

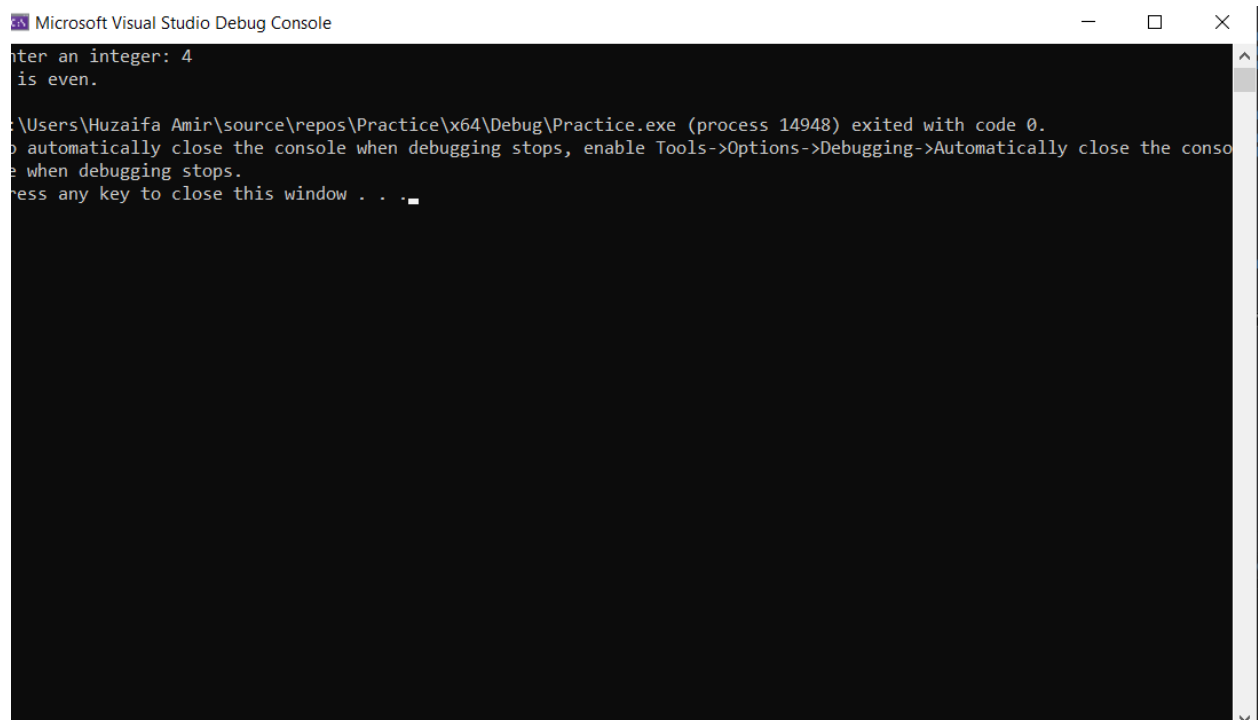
int main() {
    int num;

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

    if (num % 2 == 0) {
        cout << num << " is even." << endl;
    }
    else {
        cout << num << " is odd." << endl;
    }

    return 0;
}
```

Compilation of the code:



```
Microsoft Visual Studio Debug Console

Enter an integer: 4
4 is even.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 14948) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 2: Write a program that inputs two integers and prints the larger one.

```
#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 << num1 << " is the larger number." << endl;
}
else {
    cout << num2 << " is the larger number." << endl;
}

return 0;
}

```

Compilation of the code:

```

Microsoft Visual Studio Debug Console
Enter the first integer: 50
Enter the second integer: 22
50 is the larger number.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 7220) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

QUESTION NO 3: Write a program that inputs two words and checks if they are the same. Make a difference between uppercase and lowercase letters (“Ali”, “ali”, “ALI” are different words). You have to print "yes, the words are the same" or "no, the words are different".

```

#include<iostream>
using namespace std;

int main() {
    string word1, word2;

    cout << "Enter the first word: ";
    cin >> word1;

    cout << "Enter the second word: ";
    cin >> word2;

    if (word1 == word2) {
        cout << "Yes, the words are the same." << endl;
    }
    else {
        cout << "No, the words are different." << endl;
    }

    return 0;
}

```

Compilation of the code:



```

Microsoft Visual Studio Debug Console

Enter the first word: ali
Enter the second word: ali
Yes, the words are the same.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 14160) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

QUESTION NO 4:

```

#include<iostream>
using namespace std;
int main() {

    float originalPrice;

```

```

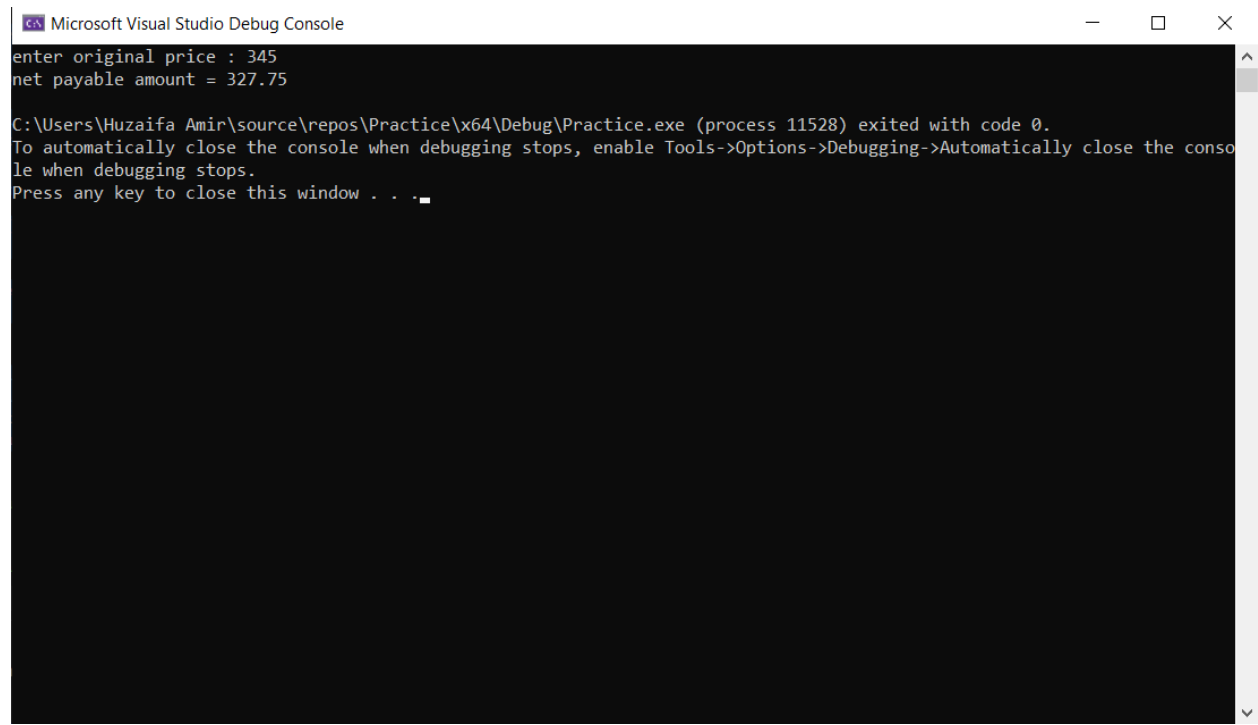
cout << "enter original price : ";
cin >> originalPrice;
float appliedDiscount = 0;

if (originalPrice <= 5000) {
    appliedDiscount = 5;
}
else {
    appliedDiscount = 10;
}

float discount = originalPrice * (appliedDiscount / 100);
float netPayable = originalPrice - discount;
cout << "net payable amount = " << netPayable << endl;
return 0;
}

```

Compilation of the code:



```

Microsoft Visual Studio Debug Console
enter original price : 345
net payable amount = 327.75

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 11528) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

QUESTION NO 5: Develop a calculator that performs basic arithmetic operations (+, -, *, /, %).

```

#include<iostream>
using namespace std;

int main() {

```

```

double num1, num2, result;
string operation;

// Input the first value
cout << "Enter the first value: ";
cin >> num1;

// Input the operator
cout << "Enter an operator (+, -, *, /): ";
cin >> operation;

// Input the second value
cout << "Enter the second value: ";
cin >> num2;

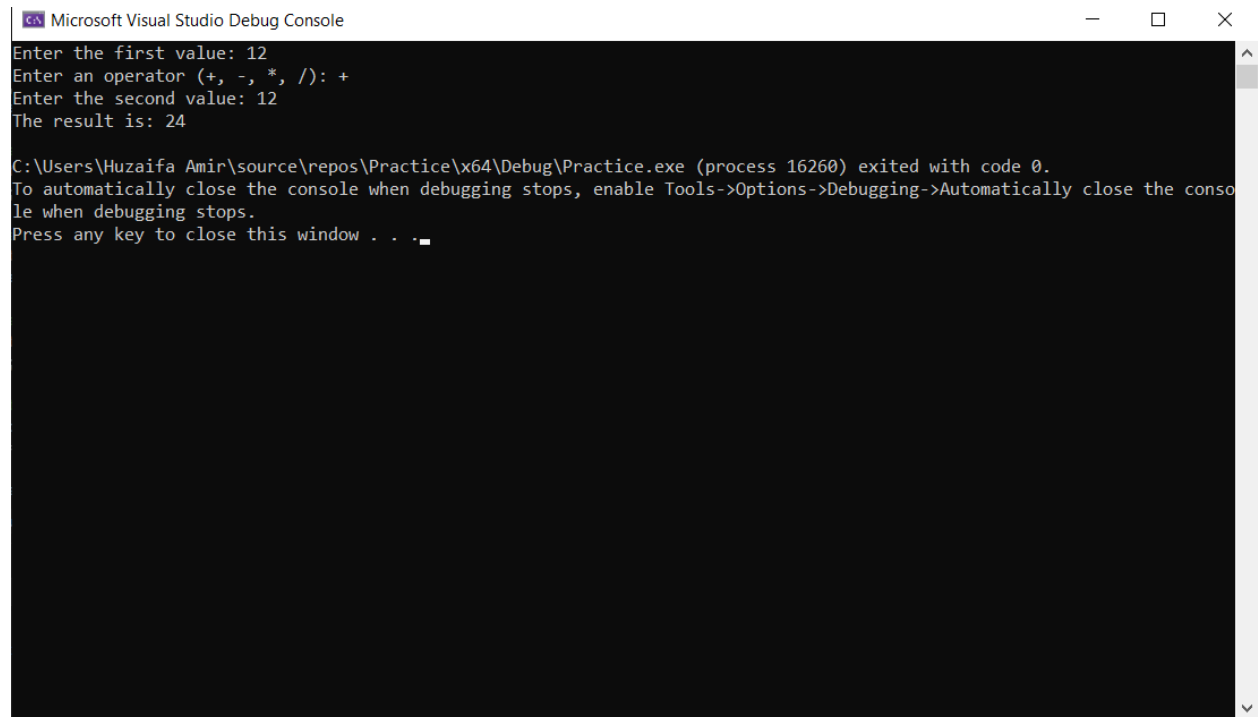
// Perform the operation based on user input
if (operation == "+") {
    result = num1 + num2;
}
else if (operation == "-") {
    result = num1 - num2;
}
else if (operation == "*") {
    result = num1 * num2;
}
else if (operation == "/") {
    if (num2 != 0) {
        result = num1 / num2;
    }
    else {
        cout << "Error: Division by zero!" << endl;
        return 1;
    }
}
else {
    cout << "Invalid operator!" << endl;
    return 1;
}

// Output the result
cout << "The result is: " << result << endl;

return 0;
}

```

Compilation of the code:



Microsoft Visual Studio Debug Console

```
Enter the first value: 12
Enter an operator (+, -, *, /): +
Enter the second value: 12
The result is: 24

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 16260) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

LAB TASK 10

QUESTION NO 1: Scholarship Eligibility Checker

```

#include<iostream>
using namespace std;

int main() {
    float percentage, familyIncome;
    string extracurricular;

    // Input the percentage of marks
    cout << "Enter your percentage of marks: ";
    cin >> percentage;

    // Input the family income
    cout << "Enter your family income (in Rs.): ";
    cin >> familyIncome;

    // Input extracurricular activities participation
    cout << "Do you participate in extracurricular activities? (yes/no): ";
    cin >> extracurricular;

    // Determine scholarship eligibility using nested if-else
    if (percentage >= 80) {
        if (percentage > 90) {
            if (familyIncome < 50000) {
                cout << "Full Scholarship awarded." << endl;
            }
            else if (familyIncome >= 50000 && familyIncome <= 100000) {
                cout << "Half Scholarship awarded." << endl;
            }
            else {
                cout << "No Scholarship awarded." << endl;
            }
        }
        else {
            cout << "No Scholarship awarded." << endl;
        }
    }
    else {
        cout << "No Scholarship awarded." << endl;
    }
}

return 0;
}

```

Compilation of the code:

Microsoft Visual Studio Debug Console

Enter your percentage of marks: 92

Enter your family income (in Rs.): 90000

Do you participate in extracurricular activities? (yes/no): yes

Half Scholarship awarded.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 13752) exited with code

Press any key to close this window . . .

QUESTION NO 2: Admission Eligibility

```

#include<iostream>
using namespace std;

int main() {
    float highSchoolMarks;
    int satScore;

    // Input the high school marks
    cout << "Enter your high school marks: ";
    cin >> highSchoolMarks;

    // Input the SAT score
    cout << "Enter your SAT score: ";
    cin >> satScore;

    // Determine admission eligibility using nested if-else
    if (highSchoolMarks >= 60) {
        if (highSchoolMarks > 75) {
            cout << "Admitted." << endl;
        }
        else if (highSchoolMarks >= 60 && highSchoolMarks <= 75) {
            if (satScore >= 1200) {
                cout << "Admitted with SAT requirement." << endl;
            }
            else {
                cout << "Rejected." << endl;
            }
        }
    }
    else {
        cout << "Rejected." << endl;
    }

    return 0;
}

```

Compilation of the code:


```
Microsoft Visual Studio Debug Console

Enter your high school marks: 97
Enter your SAT score: 78
Admitted.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 15904) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 3: Grading System with Attendance

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

int main() {
    int marks, attendance;

    // Input the marks
    cout << "Enter your marks: ";
    cin >> marks;

    // Input the attendance percentage
    cout << "Enter your attendance percentage: ";
    cin >> attendance;

    // Determine the grade using nested if-else
    if (attendance > 75) {
        if (marks >= 85) {
            cout << "Grade: A" << endl;
        }
        else if (marks >= 80 && marks < 85) {
            cout << "Grade: A-" << endl;
        }
        else if (marks >= 75 && marks < 80) {
            cout << "Grade: B+" << endl;
        }
        else if (marks >= 70 && marks < 75) {
            cout << "Grade: B" << endl;
        }
        else if (marks >= 65 && marks < 70) {
```

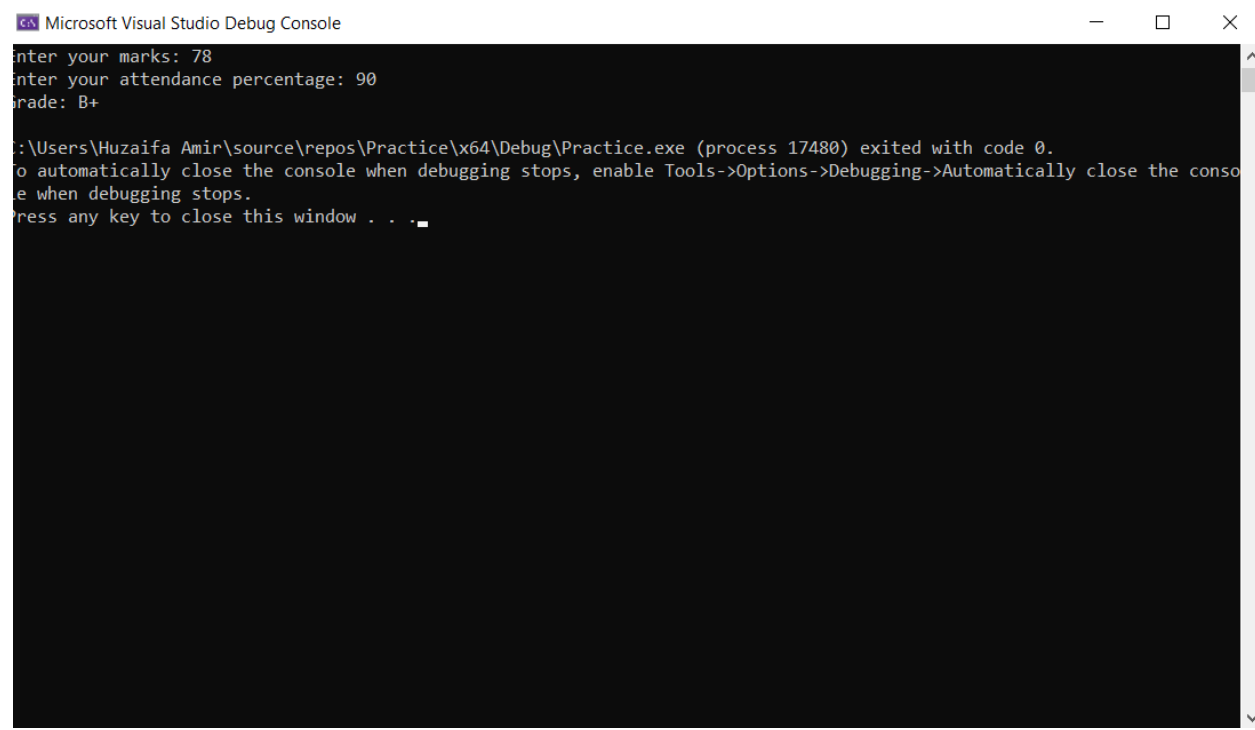
```

        cout << "Grade: C+" << endl;
    }
    else if (marks >= 60 && marks < 65) {
        cout << "Grade: C" << endl;
    }
    else if (marks >= 55 && marks < 60) {
        cout << "Grade: D+" << endl;
    }
    else if (marks >= 50 && marks < 55) {
        cout << "Grade: D" << endl;
    }
    else {
        cout << "Grade: F" << endl;
    }
}
else {
    cout << "Grade: F" << endl;
}

return 0;
}

```

Compilation of the code:



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output shows the program's execution: it prompts for "enter your marks: 78" and "enter your attendance percentage: 90", then displays "Grade: B+". Below this, a message states: "C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 17480) exited with code 0." followed by instructions: "To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops." and "Press any key to close this window . . .".

LAB TASK 11

QUESTION NO 1: Loan Eligibility System

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

int main() {
    int age, monthlyIncome, loanAmount;
    string existingLoan, defaultStatus;

    // Input the age
    cout << "Enter your age: ";
    cin >> age;

    // Input the monthly income
    cout << "Enter your monthly income: ";
    cin >> monthlyIncome;

    // Input the loan amount requested
    cout << "Enter the loan amount requested: ";
    cin >> loanAmount;

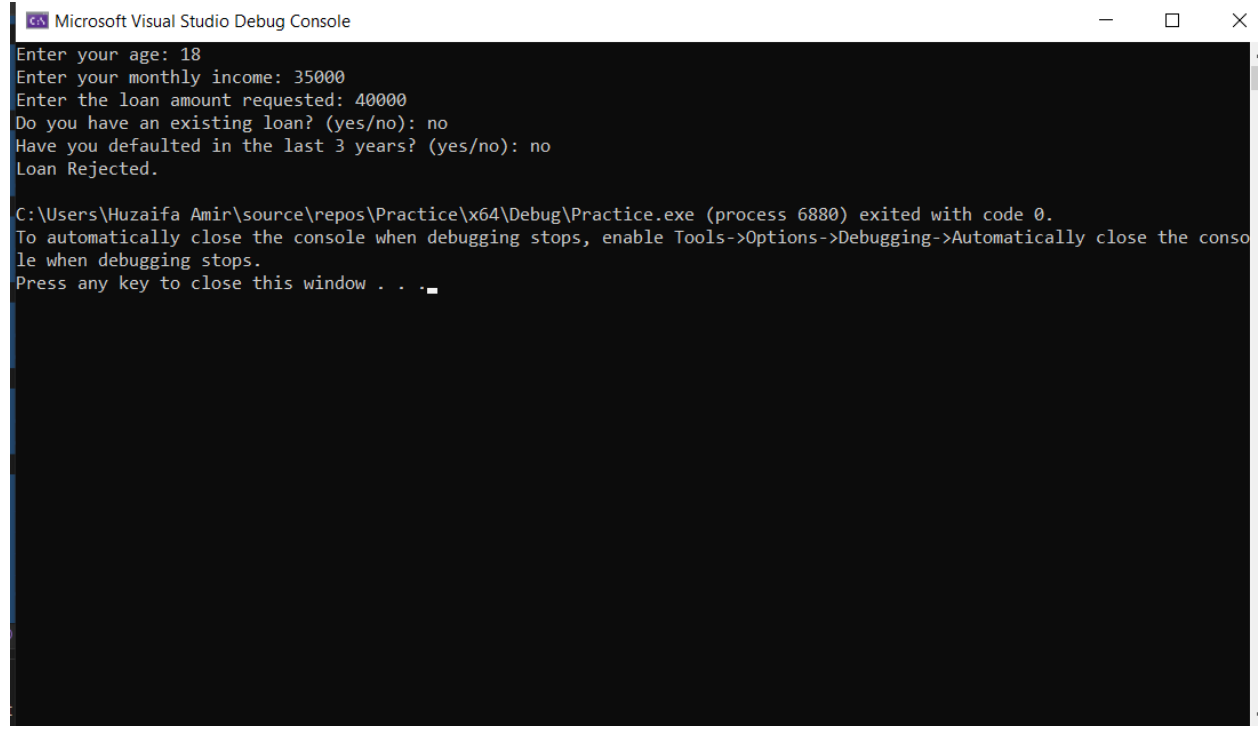
    // Input existing loan status
    cout << "Do you have an existing loan? (yes/no): ";
    cin >> existingLoan;

    // Input default status in last 3 years
    cout << "Have you defaulted in the last 3 years? (yes/no): ";
    cin >> defaultStatus;

    // Check loan eligibility using nested if-else
    if (age >= 21 && age <= 60) {
        if (existingLoan == "no" && defaultStatus == "no") {
            if (loanAmount > 500000) {
                if (monthlyIncome > 40000) {
                    cout << "Loan Approved." << endl;
                }
            }
            else {
                cout << "Loan Rejected." << endl;
            }
        }
        else {
            if (monthlyIncome > 25000) {
                cout << "Loan Approved." << endl;
            }
            else{
                cout << "Loan Rejected." << endl;
            }
        }
    }
    else {
        cout << "Loan Rejected." << endl;
    }
    else {
        cout << "Loan Rejected." << endl;
    }
}
```

```
    return 0;  
}
```

Compilation of the code:



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

```
Enter your age: 18  
Enter your monthly income: 35000  
Enter the loan amount requested: 40000  
Do you have an existing loan? (yes/no): no  
Have you defaulted in the last 3 years? (yes/no): no  
Loan Rejected.  
  
C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 6880) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .
```

QUESTION NO 2: Job Eligibility Criteria

```

#include<iostream>
using namespace std;

int main() {
    int yearsOfExperience, age;
    string hasDegree, hasConviction;

    // Input the years of experience
    cout << "Enter your years of experience: ";
    cin >> yearsOfExperience;

    // Input the age
    cout << "Enter your age: ";
    cin >> age;

    // Input degree status
    cout << "Do you have a degree? (yes/no): ";
    cin >> hasDegree;

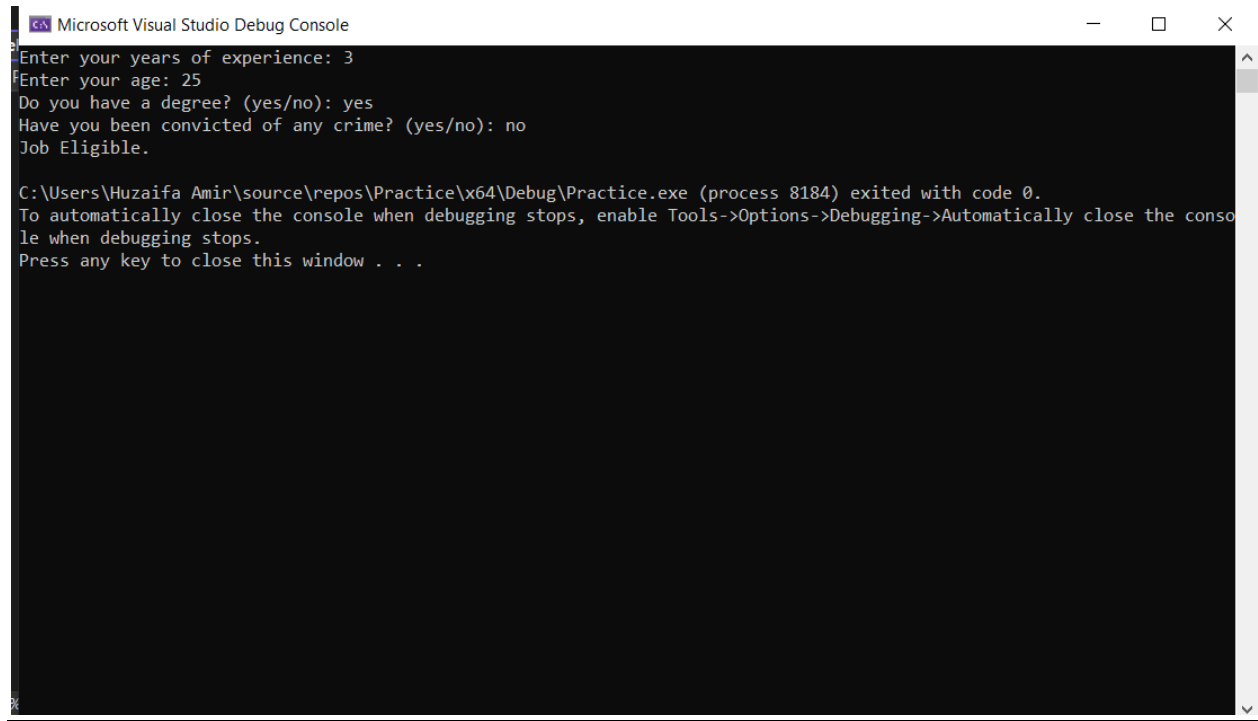
    // Input conviction status
    cout << "Have you been convicted of any crime? (yes/no): ";
    cin >> hasConviction;

    // Check job eligibility using nested if-else
    if (age >= 21) {
        if (yearsOfExperience >= 2) {
            if (yearsOfExperience > 5) {
                // Experience > 5 years, no degree required
                if (hasConviction == "no") {
                    cout << "Job Eligible." << endl;
                }
            }
            else {
                cout << "Job Not Eligible." << endl;
            }
        }
        else {
            // Experience < 5 years, degree required
            if (hasDegree == "yes" && hasConviction == "no") {
                cout << "Job Eligible." << endl;
            }
            else {
                cout << "Job Not Eligible." << endl;
            }
        }
    }
    else {
        cout << "Job Not Eligible." << endl;
    }
}

return 0;
}

```

Compilation of the code:

A screenshot of the Microsoft Visual Studio Debug Console window. The window has a title bar with the text "Microsoft Visual Studio Debug Console" and standard minimize, maximize, and close buttons. The console output is as follows:
Enter your years of experience: 3
Enter your age: 25
Do you have a degree? (yes/no): yes
Have you been convicted of any crime? (yes/no): no
Job Eligible.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 8184) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
The console text is white on a black background. There is a vertical scrollbar on the right side of the console area.

QUESTION NO 3: Electricity Bill Calculator

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

```

int main() {
    int units;
    double totalBill;

    // Input the units consumed
    cout << "Enter the number of units consumed: ";
    cin >> units;

    // Calculate the bill
    if (units <= 100) {
        totalBill = units * 5;
    }
    else if (units <= 300) {
        totalBill = (100 * 5) + ((units - 100) * 7);
    }
    else {
        totalBill = (100 * 5) + (200 * 7) + ((units - 300) * 10);
    }

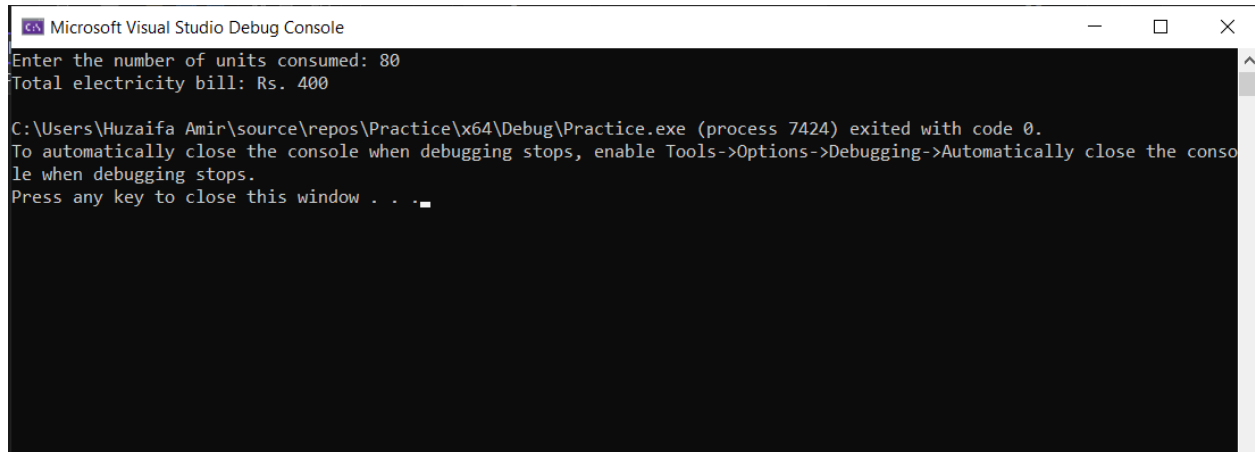
    // Apply 5% surcharge if total bill exceeds Rs. 1000
    if (totalBill > 1000) {
        totalBill *= 1.05; // Adding 5% surcharge
    }

    // Display the total bill
    cout << "Total electricity bill: Rs. " << totalBill << endl;

    return 0;
}

```

Compilation of the code:



```

Microsoft Visual Studio Debug Console
Enter the number of units consumed: 80
Total electricity bill: Rs. 400

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 7424) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

LAB TASK 12

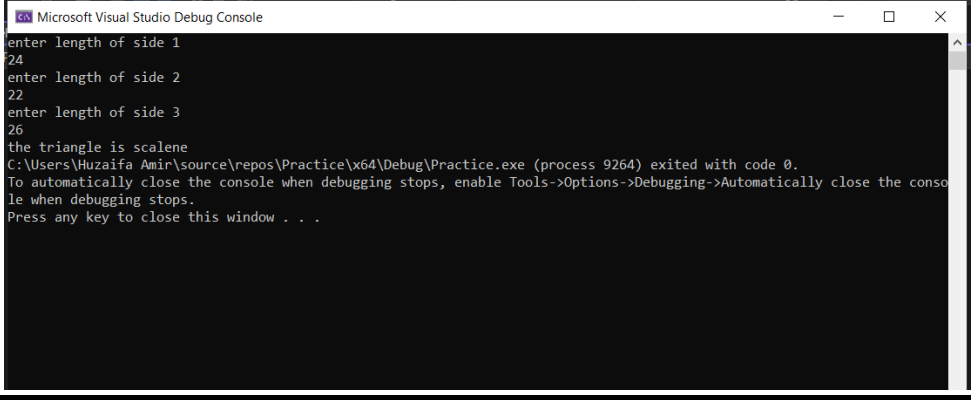
QUESTION NO 1: Write a program that determines the type of a triangle based on user input for three sides (a, b, c)

```

#include<iostream>
using namespace std;
int main() {
    string triangle1 = "equilateral triangle", triangle2 = "isosceles triangle", triangle3 = "scalene triangle";
    int a, b, c;
    cout << "enter length of side 1 \n"; cin >> a;
    cout << "enter length of side 2 \n"; cin >> b;
    cout << "enter length of side 3 \n"; cin >> c;
    if (a + b > c && a + c > b && b + c > a) {
        if (a == b && b == c && c == a) {
            /*for equal triangle*/
            cout << " The triangle is Equilateral.";
        }
        else if ((a == b || b == c || c == a) && (a != b || a != c || b != c)) {
            /* for isosceles*/
            cout << " The triangle is isosceles";
        }
        else if (a != b && b != c && a != c) {
            /*for scalene*/
            cout << "the triangle is scalene";
        }
    }
    else {
        /* for invalid*/
        cout << "invalid triangle. The sides do not satisfy the triangle inequality";
    }
    return 0;
}

```

Compilation of the code:



```

Microsoft Visual Studio Debug Console
enter length of side 1
24
enter length of side 2
22
enter length of side 3
26
the triangle is scalene
C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 9264) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

QUESTION NO 2: Write a program to evaluate a student's eligibility for a scholarship

```

#include <iostream>
using namespace std;

int main() {
    /* enter scores and percentage*/
    float mathScore, englishScore, overallPercentage;

```



```

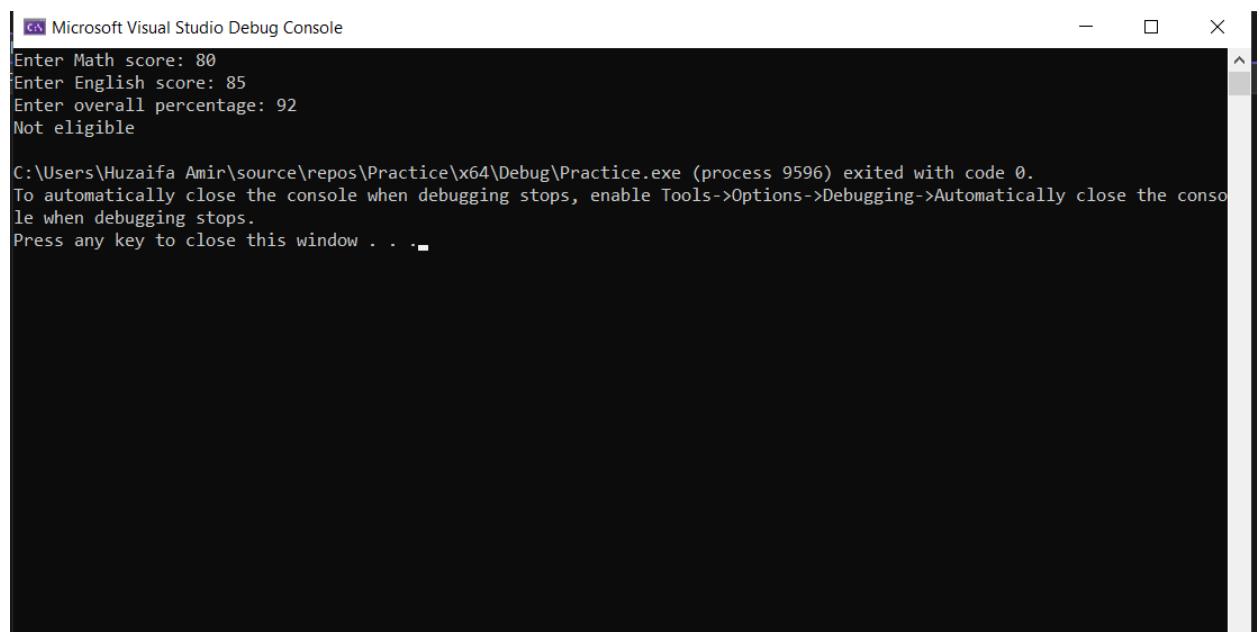
cout << "Enter Math score: ";
cin >> mathScore;
cout << "Enter English score: ";
cin >> englishScore;
cout << "Enter overall percentage: ";
cin >> overallPercentage;

if ((mathScore >= 85 && englishScore >= 80) && (overallPercentage > 90)) {
    /* if eligible for scholarship*/
    cout << "Eligible for scholarship" << endl;
}
else {
    /* if not*/
    cout << "Not eligible" << endl;
}

return 0;
}

```

Compilation of the code:



The screenshot shows the Microsoft Visual Studio Debug Console window. The output of the program is as follows:

```

Enter Math score: 80
Enter English score: 85
Enter overall percentage: 92
Not eligible

C:\Users\Huzaiifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 9596) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

QUESTION NO 3: Write a program to check if a given number is odd or even using the ternary operator.

```

#include <iostream>
using namespace std;

int main() {
    int number;
    /* enter a num to check even or odd*/
    cout << "Enter a number: ";
}

```

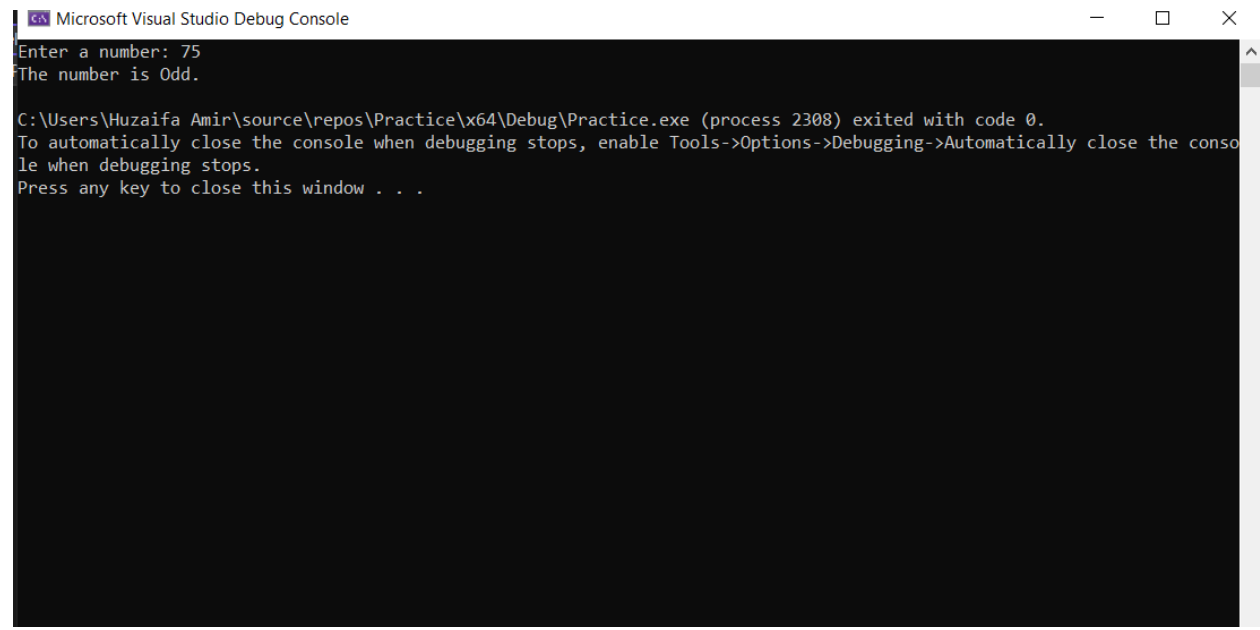
```
cin >> number;

string result = (number % 2 == 0) ? "The number is Even." : "The number is Odd.";
/* here we check num is even or odd*/
cout << result << endl;

return 0;

}
```

Compilation of the code:

A screenshot of the Microsoft Visual Studio Debug Console window. The window title is "Microsoft Visual Studio Debug Console". The console output shows: "Enter a number: 75", "The number is Odd.", and a message indicating the program exited with code 0. The message also includes instructions on how to automatically close the console when debugging stops. The console is black with white text. The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

```
Microsoft Visual Studio Debug Console
Enter a number: 75
The number is Odd.

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 2308) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

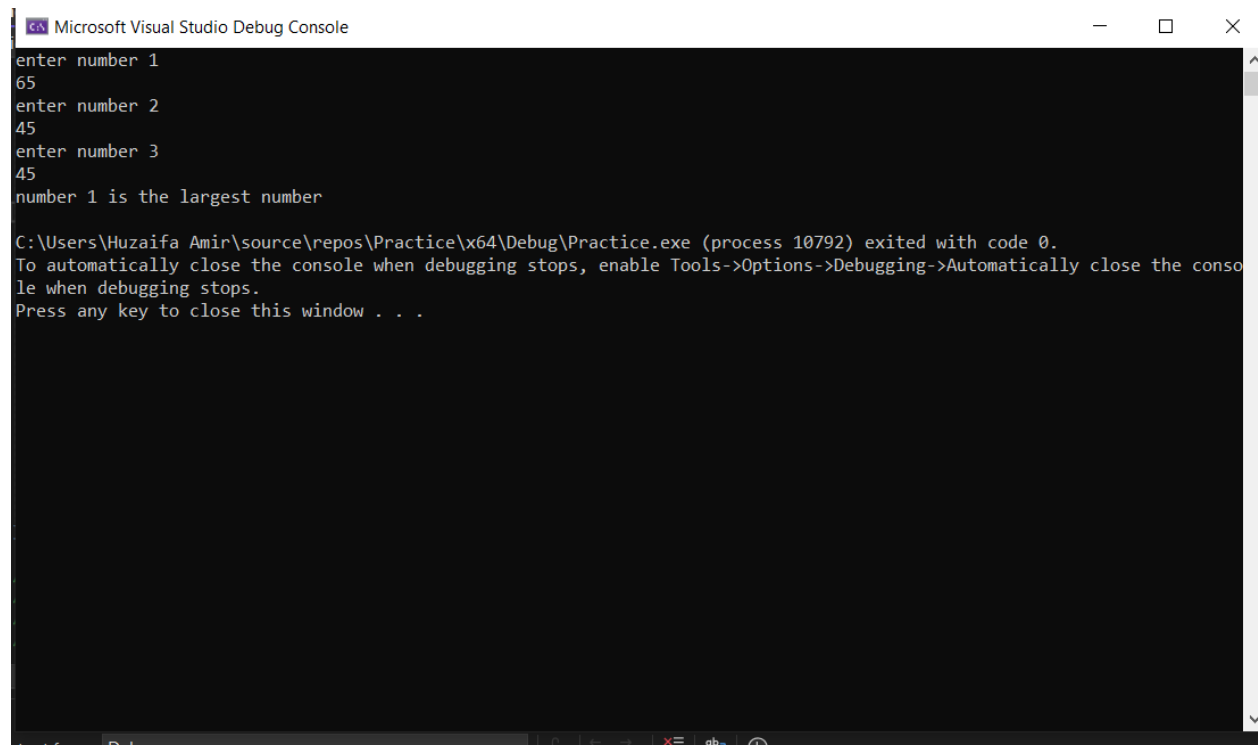
QUESTION NO 4: Write two versions of a program to find the largest of three numbers

```

#include<iostream>
using namespace std;
int main() {
    /*using nested if-else*/
    //taking inputs
    int a, b, c;
    cout << "enter number 1 \n";cin >> a;
    cout << "enter number 2 \n";cin >> b;
    cout << "enter number 3 \n";cin >> c;
    //determining the largest number
    if (a > b) {
        if (a > c) {
            cout << "number 1 is the largest number \n";
        }
        else if (c > a) {
            cout << "number 3 is the largest number \n";
        }
    }
    else if (b > a) {
        if (b > c) {
            cout << "number 2 is the largest number \n";
        }
        else if (c > b) {
            cout << "number 3 is the largest number \n";
        }
    }
    else if (a > c) {
        if (a > b) {
            cout << "number 1 is the largest number";
        }
        else if (b > a) {
            cout << "number 3 is the largest number";
        }
    }
    return 0;
}

```

Compilation of the code:

A screenshot of the Microsoft Visual Studio Debug Console window. The window has a title bar with the text "Microsoft Visual Studio Debug Console" and standard minimize, maximize, and close buttons. The console output is as follows:

```
enter number 1
65
enter number 2
45
enter number 3
45
number 1 is the largest number

C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 10792) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

QUESTION NO 5: Create a simple calculator program with the following functionality using switch

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

```

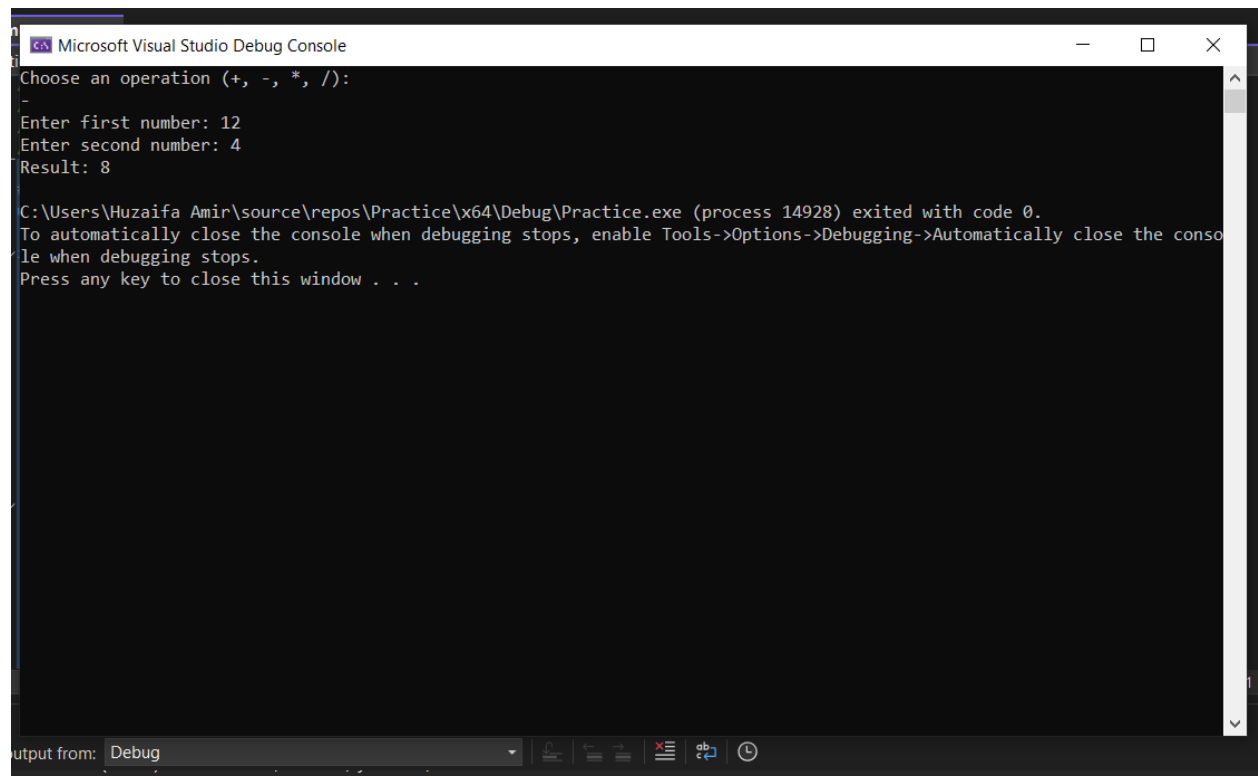
int main() {
    char operation;
    double num1, num2;
    /* enter operation */
    cout << "Choose an operation (+, -, *, /): " << endl;
    cin >> operation;

    cout << "Enter first number: ";
    cin >> num1;
    cout << "Enter second number: ";
    cin >> num2;
    /* enter the num to check cal*/
    switch (operation) {
    case '+':
        cout << "Result: " << (num1 + num2) << endl;
        break;
    case '-':
        cout << "Result: " << (num1 - num2) << endl;
        break;
    case '*':
        cout << "Result: " << (num1 * num2) << endl;
        break;
    case '/':
        if (num2 != 0) {
            cout << "Result: " << (num1 / num2) << endl;
        }
        else {
            cout << "Error: Division by zero." << endl;
        }
        break;
    default:
        cout << "Error: Invalid operation." << endl;
        break;
    }

    return 0;
}

```

Compilation of the code:



```
Microsoft Visual Studio Debug Console
Choose an operation (+, -, *, /):
-
Enter first number: 12
Enter second number: 4
Result: 8
C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe (process 14928) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
Output from: Debug
```

QUESTION NO 6: Grocery store checkout system

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {

    int choice, quantity;

    double total_cost = 0;


    cout << "Welcome to the Grocery Store\n";

    cout << "Menu:\n";

    cout << "1. Apples  - $100 per kg\n";

    cout << "2. Bananas - $50 per dozen\n";

    cout << "3. Oranges - $70 per kg\n";

    cout << "4. Milk    - $60 per liter\n";

    cout << "5. Bread   - $40 per loaf\n";


    while (true) {

        cout << "\nEnter item number to buy (1-5) or 0 to checkout: ";

        cin >> choice;


        if (choice == 0) break; // Exit loop on 0


        cout << "Enter quantity: ";

        cin >> quantity;


        switch (choice) {

            case 1: total_cost += 100 * quantity; break; // Apples

            case 2: total_cost += 50 * quantity; break; // Bananas

            case 3: total_cost += 70 * quantity; break; // Oranges

            case 4: total_cost += 60 * quantity; break; // Milk
```

```

        case 5: total_cost += 40 * quantity; break; // Bread

        default:

            cout << "Invalid choice. Try again.\n";

            break;

        }

    }

// Apply discount

double discount = 0;

if (total_cost > 10000) discount = 0.20;

else if (total_cost > 5000) discount = 0.10;

else if (total_cost >= 5000) discount = 0.05;

double discount_amount = total_cost * discount;

double final_amount = total_cost - discount_amount;

// Output results

cout << "\nTotal Cost: $" << total_cost;

cout << "\nDiscount: $" << discount_amount;

cout << "\nFinal Amount to Pay: $" << final_amount;

cout << "\nThank you for shopping with us!\n";

return 0;

}

```

Compilation of the code:


```
C:\Users\Huzaifa Amir\source\repos\Practice\x64\Debug\Practice.exe
Welcome to the Grocery Store
Menu:
1. Apples - $100 per kg
2. Bananas - $50 per dozen
3. Oranges - $70 per kg
4. Milk - $60 per liter
5. Bread - $40 per loaf

Enter item number to buy (1-5) or 0 to checkout: 11
Enter quantity: 12
Invalid choice. Try again.
```