
1- Create a program to divide one number by another, entered by the user.

إنشاء برنامج لتقسيم رقم على آخر يدخله المستخدم.

Input

```
Enter two numbers: 8 2
```

Output

```
Quotient: 4
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float num1, num2;

    cout << "Enter two numbers: ";
    cin >> num1 >> num2;

    // Check for division by zero
    if (num2 != 0)
        cout << "Quotient: " << num1 / num2 << endl;
    else
        cout << "Cannot divide by zero." << endl;

    return 0;
}
```

2- Write a program that takes two numbers as input, calculates their quotient (if the second number is not zero), and then computes the absolute difference between the two numbers. Include appropriate error handling for division by zero.

اكتب برنامجًا يأخذ رقمين كمدخلات، ويحسب حاصلهما (إذا كان الرقم الثاني ليس صفرًا)، ثم يحسب الفرق المطلق بين الرقمين. قم بتضمين معالجة مناسبة للأخطاء عند القسمة على صفر.

Input

```
Enter two numbers: 8 2
```

Output

```
Quotient: 4
Absolute Difference: 6
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float num1, num2;

    // Input two numbers
    cout << "Enter two numbers: ";
    cin >> num1 >> num2;

    // Check for division by zero
    if (num2 != 0)
        cout << "Quotient: " << num1 / num2 << endl;
    else
        cout << "Cannot divide by zero." << endl;

    // Calculate absolute difference
    if (num1 > num2)
        cout << "Absolute Difference: " << num1 - num2 << endl;
    else
        cout << "Absolute Difference: " << num2 - num1 << endl;

    return 0;
}
```

3- Write a program that takes three numbers as input and determines the maximum among them.

اكتب برنامجا يأخذ ثلاثة أرقام كمدخلات ويحدد الحد الأقصى بينها.

Input

```
Enter three numbers: 5 7 2
```

Output

```
Maximum Number: 7
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float num1, num2, num3;

    // Input three numbers
    cout << "Enter three numbers: ";
    cin >> num1 >> num2 >> num3;

    // Find the maximum
    float maxNum = (num1 > num2) ? (num1 > num3 ? num1 : num3) : (num2 > num3 ? num2 : num3);

    cout << "Maximum Number: " << maxNum << endl;

    return 0;
}
```

4- Create a program that takes a character as input and determines whether it is a vowel or a consonant.

قم بإنشاء برنامج يأخذ حرفًا كمدخل ويحدد ما إذا كان حرفًا متحركًا أم حرفًا ساكنًا.

Input

```
Enter a character: *
```

Output

```
Invalid input. Please enter a valid character.
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    char ch;

    // Input a character
    cout << "Enter a character: ";
    cin >> ch;

    // Check for vowel or consonant
    if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
        switch (ch) {
            case 'a':
            case 'e':
            case 'i':
            case 'o':
            case 'u':
            case 'A':
            case 'E':
            case 'I':
            case 'O':
            case 'U':
                cout << "Vowel" << endl;
                break;
            default:
                cout << "Consonant" << endl;
        }
    } else {
        cout << "Invalid input. Please enter a valid character." << endl;
    }

    return 0;
}
```

5- Write a program that takes a student's marks as input and determines their grade based on the following criteria:

90-100: A
80-89: B
70-79: C
60-69: D
Below 60: F

اكتب برنامجًا يأخذ علامات الطالب كمدخل ويحدد درجاته بناءً على المعايير التالية

90-100: A
80-89: B
70-79: C
60-69: D
Below 60: F

Input

```
Enter student's marks: 95
```

Output

```
Grade: A
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float marks;

    // Input student's marks
    cout << "Enter student's marks: ";
    cin >> marks;

    // Determine the grade
    if (marks >= 90 && marks <= 100)
        cout << "Grade: A" << endl;
    else if (marks >= 80 && marks < 90)
        cout << "Grade: B" << endl;
    else if (marks >= 70 && marks < 80)
        cout << "Grade: C" << endl;
    else if (marks >= 60 && marks < 70)
        cout << "Grade: D" << endl;
    else if (marks < 60 && marks >= 0)
        cout << "Grade: F" << endl;
    else
        cout << "Invalid input. Marks should be between 0 and 100." << endl;

    return 0;
}
```

6- Create a program that takes the current hour as input and outputs a greeting based on the time of day:
5 AM to 11:59 AM: Good Morning
12 PM to 4:59 PM: Good Afternoon
5 PM to 8:59 PM: Good Evening
9 PM to 4:59 AM: Good Night

قم بإنشاء برنامج يأخذ الساعة الحالية كمدخل ويخرج تحية بناءً على الوقت من اليوم:

5 AM to 11:59 AM: Good Morning
12 PM to 4:59 PM: Good Afternoon
5 PM to 8:59 PM: Good Evening
9 PM to 4:59 AM: Good Night

Input

```
Enter the current hour (24-hour format): 14
```

Output

```
Good Afternoon
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    int currentHour;

    // Input the current hour
    cout << "Enter the current hour (24-hour format): ";
    cin >> currentHour;

    // Greet based on the time of day
    if (currentHour >= 5 && currentHour < 12)
        cout << "Good Morning" << endl;
    else if (currentHour >= 12 && currentHour < 17)
        cout << "Good Afternoon" << endl;
    else if (currentHour >= 17 && currentHour < 21)
        cout << "Good Evening" << endl;
    else if ((currentHour >= 21 && currentHour <= 23) || (currentHour >= 0 && currentHour < 5))
        cout << "Good Night" << endl;
    else
        cout << "Invalid input. Please enter a valid hour (0-23)." << endl;

    return 0;
}
```

7- Create a program that acts as a simple calculator, allowing users to perform addition, subtraction, multiplication, and division. using switch

إنشاء برنامج يعمل كآلة حاسبة بسيطة، مما يسمح للمستخدمين بإجراء عمليات الجمع والطرح والضرب والقسمة. using switch

Input

```
Enter two numbers: 5 6
Enter an arithmetic operation (+, -, *, /): -
```

Output

```
Result: -1
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float num1, num2;
    char operation;

    // Input two numbers and an arithmetic operation
    cout << "Enter two numbers: ";
    cin >> num1 >> num2;

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

    // Perform the requested arithmetic operation
    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 << "Cannot divide by zero." << endl;
            break;
        default:
            cout << "Invalid operation. Please enter +, -, *, or /." << endl;
    }

    return 0;
}
```

8- Write a program that calculates the factorial of a given positive integer.

اكتب برنامجاً يقوم بحساب مضروب عدد صحيح موجب معين.

Input

```
Enter a positive integer: 5
```

Output

```
Factorial of 5: 120
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    int num;
    unsigned long long factorial = 1;

    // Input a positive integer
    cout << "Enter a positive integer: ";
    cin >> num;

    // Calculate factorial
    if (num >= 0) {
        for (int i = 1; i <= num; ++i) {
            factorial *= i;
        }
        cout << "Factorial of " << num << ": " << factorial << endl;
    } else {
        cout << "Invalid input. Please enter a non-negative integer." << endl;
    }

    return 0;
}
```

9- Write a program that acts as a simple arithmetic calculator. The program should prompt the user to enter two numbers and an arithmetic operation (+, -, *, /). Using if

اكتب برنامجًا يعمل كآلة حاسبة حسابية بسيطة. يجب أن يطلب البرنامج من المستخدم إدخال رقمين وإجراء عملية حسابية (+، -، *، /). Using if

Input

```
Enter two numbers and an arithmetic operation (+, -, *, /): 10 * 2.5
```

Output

```
Result: 25
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float x, y;
    char operation;

    // Prompt the user to enter two numbers and an arithmetic operation
    cout << "Enter two numbers and an arithmetic operation (+, -, *, /): ";
    cin >> x >> operation >> y;

    // Perform the requested arithmetic operation and display the result
    if (operation == '+')
        cout << "Result: " << x + y << endl;
    else if (operation == '-')
        cout << "Result: " << x - y << endl;
    else if (operation == '*')
        cout << "Result: " << x * y << endl;
    else if (operation == '/')
        cout << "Result: " << x / y << endl;
    else
        cout << "Invalid operation. Please enter +, -, *, or /." << endl;

    return 0;
}
```

10- Write a program for a continuous arithmetic calculator. The program should use a while loop to continuously prompt the user to enter two numbers and an arithmetic operation (+, -, *, /). It should then perform the requested operation and display the result. The program will keep running until manually stopped.

اكتب برنامجًا للآلة الحاسبة الحسابية المستمرة. يجب أن يستخدم البرنامج حلقة while لمطالبة المستخدم بشكل مستمر بإدخال رقمين وعملية حسابية (+، -، *، /). وينبغي بعد ذلك إجراء العملية المطلوبة وعرض النتيجة. سيستمر البرنامج في العمل حتى يتوقف يدويًا.

Input & Output

```
Enter two numbers and an arithmetic operation (+, -, *, /): 1 + 5
Result: 6
Enter two numbers and an arithmetic operation (+, -, *, /): 5 / 2
Result: 2.5
Enter two numbers and an arithmetic operation (+, -, *, /): 3 * 8
Result: 24
Enter two numbers and an arithmetic operation (+, -, *, /):
```

Solution

```cpp
// www.gammal.tech

#include<iostream>
using namespace std;

int main() {
    float x, y;
    char operation; // +, -, *, /

    while (1) {
        // Continuously prompt the user for input
        cout << "Enter two numbers and an arithmetic operation (+, -, *, /): ";
        cin >> x >> operation >> y;

        // Perform the requested arithmetic operation and display the result
        if (operation == '+')
            cout << "Result: " << x + y << endl;
        else if (operation == '-')
            cout << "Result: " << x - y << endl;
        else if (operation == '*')
            cout << "Result: " << x * y << endl;
        else if (operation == '/')
            cout << "Result: " << x / y << endl;
        else
            cout << "Invalid operation. Please enter +, -, *, or /." << endl;
    }

    return 0;
}
```
