Integer Restroring Division:

PROGRAM:

```c
#include <stdio.h>
#include <stdlib.h>

// Function to perform integer restoring division
void restoringDivision(int dividend, int divisor, int *quotient, int *remainder) {
    int A = 0; // Remainder register (A)
    int Q = abs(dividend); // Dividend (Q register)
    int M = abs(divisor);  // Divisor (M register)
    int n = sizeof(int) * 8; // Number of bits (assume 32 bits)

    // Perform restoring division
    for (int i = 0; i < n; i++) {
        A = (A << 1) | ((Q >> (n - 1)) & 1); // Shift left (A and Q)
        Q = Q << 1;

        A = A - M; // Subtract M from A

        if (A < 0) {
            Q = Q & ~(1); // Set the LSB of Q to 0
            A = A + M;    // Restore A
        } else {
            Q = Q | 1; // Set the LSB of Q to 1
        }
    }

    // Set quotient and remainder
    *quotient = Q;
    *remainder = A;

    // Adjust the signs of quotient and remainder
    if (dividend < 0 && divisor > 0) {
        *quotient = -*quotient;
    } else if (dividend > 0 && divisor < 0) {
        *quotient = -*quotient;
    }
```

```c
    if (dividend < 0) {
        *remainder = -*remainder;
    }
}

int main() {
    int dividend, divisor;
    int quotient, remainder;

    // Input the dividend and divisor
    printf("Enter dividend: ");
    scanf("%d", &dividend);
    printf("Enter divisor: ");
    scanf("%d", &divisor);

    // Check for division by zero
    if (divisor == 0) {
        printf("Error: Division by zero is not allowed.\n");
        return 1;
    }

    // Perform restoring division
    restoringDivision(dividend, divisor, &quotient, &remainder);

    // Output the results
    printf("Quotient: %d\n", quotient);
    printf("Remainder: %d\n", remainder);

    return 0;
}
```

INPUT & OUTPUT:

```
C:\Dev-Cpp\sicc.exe

Enter dividend: 543
Enter divisor: 62
Quotient: 8
Remainder: 47

--------------------------------
Process exited after 7.711 seconds with return value 0
Press any key to continue . . .
```

RESULT: Thus the program was executed successfully using DevC++.