// Day 15: Operators and Expressions in C

#include <stdio.h>

int main() {

// 1. Arithmetic Operators

int a = 15, b = 4;

printf("Arithmetic Operators:\n");

printf("Addition: %d + %d = %d\n", a, b, a + b);

printf("Subtraction: %d - %d = %d\n", a, b, a - b);

printf("Multiplication: %d \* %d = %d\n", a, b, a \* b);

printf("Division: %d / %d = %d\n", a, b, a / b);

printf("Modulus: %d %% %d = %d\n\n", a, b, a % b);

// 2. Increment/Decrement Operators

int x = 5;

printf("Increment/Decrement Operators:\n");

printf("Original x = %d\n", x);

printf("Post-increment x++ = %d\n", x++);

printf("After Post-increment x = %d\n", x);

printf("Pre-increment ++x = %d\n", ++x);

printf("After Pre-increment x = %d\n", x);

printf("Post-decrement x-- = %d\n", x--);

printf("After Post-decrement x = %d\n", x);

printf("Pre-decrement --x = %d\n\n", --x);

// 3. Relational Operators

int m = 10, n = 20;

printf("Relational Operators:\n");

printf("%d > %d = %d\n", m, n, m > n);

printf("%d < %d = %d\n", m, n, m < n);

printf("%d >= %d = %d\n", m, n, m >= n);

printf("%d <= %d = %d\n", m, n, m <= n);

printf("%d == %d = %d\n", m, n, m == n);

printf("%d != %d = %d\n\n", m, n, m != n);

// 4. Logical Operators

int p = 1, q = 0;

printf("Logical Operators:\n");

printf("p = %d, q = %d\n", p, q);

printf("p && q = %d\n", p && q);

printf("p || q = %d\n", p || q);

printf("!p = %d\n\n", !p);

// 5. Swap Two Numbers Using a Temporary Variable

int s1 = 5, s2 = 10, temp;

printf("Swap Using Temporary Variable:\n");

printf("Before Swap: s1 = %d, s2 = %d\n", s1, s2);

temp = s1;

s1 = s2;

s2 = temp;

printf("After Swap: s1 = %d, s2 = %d\n\n", s1, s2);

// 6. Swap Two Numbers Without Using a Temporary Variable

int s3 = 15, s4 = 25;

printf("Swap Without Temporary Variable:\n");

printf("Before Swap: s3 = %d, s4 = %d\n", s3, s4);

s3 = s3 + s4;

s4 = s3 - s4;

s3 = s3 - s4;

printf("After Swap: s3 = %d, s4 = %d\n\n", s3, s4);

// 7. Evaluate an Arithmetic Expression

int c = 2;

int result = (a + b) \* c;

printf("Evaluate Arithmetic Expression:\n");

printf("Result of (a + b) \* c = %d\n\n", result);

// 8. Bitwise AND, OR, XOR

int bit1 = 12, bit2 = 25;

printf("Bitwise Operators:\n");

printf("bit1 = %d, bit2 = %d\n", bit1, bit2);

printf("bit1 & bit2 = %d\n", bit1 & bit2);

printf("bit1 | bit2 = %d\n", bit1 | bit2);

printf("bit1 ^ bit2 = %d\n\n", bit1 ^ bit2);

// 9. Find the Largest of Three Numbers Using Conditional Operator

int num1 = 10, num2 = 20, num3 = 15;

int largest = (num1 > num2) ? ((num1 > num3) ? num1 : num3)

: ((num2 > num3) ? num2 : num3);

printf("Largest of Three Numbers Using Conditional Operator:\n");

printf("Numbers: %d, %d, %d\n", num1, num2, num3);

printf("Largest = %d\n\n", largest);

// 10. Check if a Number is Positive, Negative, or Zero

int num = -5;

printf("Check if Number is Positive, Negative, or Zero:\n");

if (num > 0)

printf("%d is Positive\n", num);

else if (num < 0)

printf("%d is Negative\n", num);

else

printf("%d is Zero\n", num);

return 0;

}