**Day 12: Number-Based Programs**

**1. Write a program to find the LCM and HCF of two numbers.**

#include <stdio.h>  
  
int main() {  
 int num1, num2, hcf, lcm, i;  
  
 printf("Enter two positive integers: ");  
 scanf("%d %d", &num1, &num2);  
  
 // Finding HCF  
 for (i = 1; i <= num1 && i <= num2; ++i) {  
 if (num1 % i == 0 && num2 % i == 0) {  
 hcf = i;  
 }  
 }  
  
 // Finding LCM  
 lcm = (num1 \* num2) / hcf;  
  
 printf("HCF of %d and %d = %d\n", num1, num2, hcf);  
 printf("LCM of %d and %d = %d\n", num1, num2, lcm);  
  
 return 0;  
}

**2. Write a program to find the GCD of two numbers.** (Note: GCD is the same as HCF)

#include <stdio.h>  
  
int main() {  
 int num1, num2, gcd, i;  
  
 printf("Enter two positive integers: ");  
 scanf("%d %d", &num1, &num2);  
  
 // Finding GCD  
 for (i = 1; i <= num1 && i <= num2; ++i) {  
 if (num1 % i == 0 && num2 % i == 0) {  
 gcd = i;  
 }  
 }  
  
 printf("GCD of %d and %d = %d\n", num1, num2, gcd);  
  
 return 0;  
}

**3. Write a program to convert binary to decimal.**

#include <stdio.h>  
#include <math.h>  
  
int main() {  
 long long binary;  
 int decimal = 0, i = 0, rem;  
  
 printf("Enter a binary number: ");  
 scanf("%lld", &binary);  
  
 while (binary != 0) {  
 rem = binary % 10;  
 binary /= 10;  
 decimal += rem \* pow(2, i);  
 ++i;  
 }  
  
 printf("Decimal equivalent: %d\n", decimal);  
  
 return 0;  
}

**4. Write a program to convert decimal to binary.**

#include <stdio.h>  
  
int main() {  
 int decimal, binary[32], i = 0, j;  
  
 printf("Enter a decimal number: ");  
 scanf("%d", &decimal);  
  
 if (decimal == 0) {  
 printf("Binary equivalent: 0\n");  
 return 0;  
 }  
  
 while (decimal > 0) {  
 binary[i] = decimal % 2;  
 decimal /= 2;  
 i++;  
 }  
  
 printf("Binary equivalent: ");  
 for (j = i - 1; j >= 0; j--) {  
 printf("%d", binary[j]);  
 }  
 printf("\n");  
  
 return 0;  
}

**5. Write a program to find the sum of the digits of a number.**

#include <stdio.h>  
  
int main() {  
 int num, sum = 0, rem;  
  
 printf("Enter a number: ");  
 scanf("%d", &num);  
  
 while (num != 0) {  
 rem = num % 10;  
 sum += rem;  
 num /= 10;  
 }  
  
 printf("Sum of digits: %d\n", sum);  
  
 return 0;  
}

**6. Write a program to count the number of digits in a number.**

#include <stdio.h>  
  
int main() {  
 long long num;  
 int count = 0;  
  
 printf("Enter a number: ");  
 scanf("%lld", &num);  
  
 if (num == 0) {  
 count = 1;  
 } else {  
 while (num != 0) {  
 num /= 10;  
 ++count;  
 }  
 }  
  
 printf("Number of digits: %d\n", count);  
  
 return 0;  
}

**7. Write a program to check if a number is an Armstrong number.**

#include <stdio.h>  
#include <math.h>  
  
int main() {  
 int num, originalNum, rem, n = 0, result = 0;  
  
 printf("Enter an integer: ");  
 scanf("%d", &num);  
  
 originalNum = num;  
  
 // Count the number of digits  
 while (originalNum != 0) {  
 originalNum /= 10;  
 ++n;  
 }  
  
 originalNum = num; // Reset originalNum  
  
 // Calculate sum of powers of digits  
 while (originalNum != 0) {  
 rem = originalNum % 10;  
 result += pow(rem, n);  
 originalNum /= 10;  
 }  
  
 if (result == num)  
 printf("%d is an Armstrong number.\n", num);  
 else  
 printf("%d is not an Armstrong number.\n", num);  
  
 return 0;  
}

**8. Write a program to print the Fibonacci series up to n terms.**

#include <stdio.h>  
  
int main() {  
 int n, t1 = 0, t2 = 1, nextTerm;  
  
 printf("Enter the number of terms: ");  
 scanf("%d", &n);  
  
 printf("Fibonacci Series: ");  
  
 for (int i = 1; i <= n; ++i) {  
 printf("%d, ", t1);  
 nextTerm = t1 + t2;  
 t1 = t2;  
 t2 = nextTerm;  
 }  
 printf("\n");  
  
 return 0;  
}

**9. Write a program to print all prime numbers between two numbers.**

#include <stdio.h>  
  
int main() {  
 int low, high, i, flag;  
  
 printf("Enter two numbers (intervals): ");  
 scanf("%d %d", &low, &high);  
  
 printf("Prime numbers between %d and %d are: ", low, high);  
  
 while (low < high) {  
 flag = 0;  
  
 if (low <= 1) { // 0 and 1 are not prime numbers  
 ++low;  
 continue;  
 }  
  
 for (i = 2; i <= low / 2; ++i) {  
 if (low % i == 0) {  
 flag = 1;  
 break;  
 }  
 }  
  
 if (flag == 0)  
 printf("%d ", low);  
  
 ++low;  
 }  
 printf("\n");  
  
 return 0;  
}

**10. Write a program to print all factors of a given number.**

#include <stdio.h>  
  
int main() {  
 int num, i;  
  
 printf("Enter a positive integer: ");  
 scanf("%d", &num);  
  
 printf("Factors of %d are: ", num);  
 for (i = 1; i <= num; ++i) {  
 if (num % i == 0) {  
 printf("%d ", i);  
 }  
 }  
 printf("\n");  
  
 return 0;  
}