Tutorial No. 2: Recursive Functions

Exercise 1: Sum of Natural Numbers

Write a recursive function that calculates the sum of the first n natural numbers.
Prototype: `int sum(int n);`

Exercise 2: Power of a Number

Write a recursive function that calculates x^n.
Prototype: `int power(int x, int n);`

Exercise 3: GCD of Two Numbers

Write a recursive function to compute the greatest common divisor (GCD) of two integers.
Prototype: `int gcd(int a, int b);`

Exercise 4: Fibonacci Sequence

Write a recursive function that returns the nth Fibonacci number.
Prototype: `int fibonacci(int n);`

Exercise 5: Reverse a String

Write a recursive function that prints a string in reverse order.
Prototype: `void reverse(char str[]);`

Exercise 6: Count Digits

Write a recursive function that counts the number of digits in an integer.
Prototype: `int countDigits(int n);`

Exercise 7: Sum of Array Elements

Write a recursive function that computes the sum of all elements in an array.
Prototype: `int sumArray(int arr[], int size);`

Exercise 8: Check Palindrome String

Write a recursive function that checks if a string is a palindrome.
Prototype: `int isPalindrome(char str[], int start, int end);`