ADDS Prac 4 Design

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UML Diagram

Reverse	Fibonacci	EfficientFibonacci
- reverse: int - remainder: int - newString: string	- fibNum: int	- fibNum: int - newCalc: bool - fibArray: int*
+ reverseDigit(int): int + reverseString(string): string	+ calculate(int): int	+ calculate(int): int

Description

Reverse
The reverseDigit function will divide the number by 10 and find the remainder to find the ending digit, repeating the process until it reverses the whole number. The reverseString function will copy the first item in the string to another string and erase the first from the original until the whole string is reversed.

Fibonacci
Following the Fibonacci equation, the calculate function will call itself for n-1 and n-2 recursivly until it reaches the base cases of n=0 and n=1, at which point it will add them all together to get the Fibonacci.

EfficientFibonacci
The class creates a dynamic array of n+1 in size (to account for the actual numbers of 0-n) and fill in the values 0 and 1 with their fibonacci values. If the fibonacci number has already been calculated it will find it in the array, if it has not, then it will be calculated and stored in the array.

Main
The main function iterates over the input and separates the input into different variables, converting the numbers from a string to an integer, then calls the class functions on these inputs, and outputs the returned values in a cout, filtering the errors which are given by a return of -1.

Testing

Input: 10203 AbCdE 10 10
Expected Output: 30201 EdCbA 55 55

Input: ABCDE ABCDE ABCDE ABCDE
Expected Output: ERROR EDCBA ERROR ERROR

Input: -2 okay -2 -2
Expected Output: ERROR yako ERROR ERROR