

## Recursion Exercises

Write recursive methods to do the following and test them in a main program:

1. A method which accepts a positive integer value and returns the factorial value.
2. Accept two integer values and using the Euclid's method find the greatest common factor and return that value.
  - a. Task: Prompt the user to enter 2 numbers (ints) and call a recursive method that returns the GCF(passing the two numbers as parameters ) and output the greatest common factor in good format.
  - b. Use the Rules:
    - i. Rule 1 if  $(m=n)$  then  $\text{gcf}(m,n) = m$
    - ii. Rule 2 if  $(m>n)$  then  $\text{gcf}(m,n) = \text{gcf}(n, m-n)$
    - iii. Rule 3 if  $(m<n)$  then  $\text{gcf}(m,n) = \text{gcf}(n, m)$
3. A method which accepts a real value for base and an integer value (both positive and negative) and returns the power value. (example:  $2.0^3 = 8$ )
4. Think of 2 other problems which could be solved using recursion?

Answer:

Sequence: 1,1,2,3,5,8,13,21,.....=> Function =>Calculation= Method

Fibonacci's sequence =  $f(n-1)+f(n-2)$

$$F(n) = \begin{cases} 1 & \text{if } n=1 \text{ or } n=2 \\ f(n-2)+f(n-1) & \text{otherwise for all integer } n > 2 \end{cases}$$