

Approach for each problem:

1/ Use recursion, just basically define  $F(n)$  = value of the  $n$ -th Fibonacci number. Base cases are  $F[0] = F[1] = 1$ .

2/ Use recursion, as above,  $F(i) = 1.2 \dots (i - 1)i$ .  $\rightarrow$  Base is  $F(0) = 1$ .

3/ we can generate all binary strings of length  $n$  by using recursion. We start with an empty string and at each step, we add a '0' or a '1' to the string. We continue this process until the length of the string is equal to  $n$ . When the length of the string is equal to  $n$ , we print the string.

4/ we can solve the Tower of Hanoi problem by using recursion. We can move  $n - 1$  disks from the initial rod to the auxiliary rod, then move the last disk from the initial rod to the destination rod, and finally move the  $n - 1$  disks from the auxiliary rod to the destination rod. We continue this process until all disks are moved to the destination rod.

5/ check if the array is sorted in ascending order by using recursion. We start with the first element of the array and at each step, we compare the current element with the next element. If the current element is less than or equal to the next element, we continue the process. Otherwise, we return false. We continue this process until we reach the last element of the array. If we reach the last element of the array, we return true.

6/ we can solve the N-Queens problem by using recursion. We start with the first row and at each step, we try to place a queen in each cell of the row. If it is safe to place a queen in the cell, we place the queen in the cell and continue the process with the next row. We continue this process until we reach the last row. If we reach the last row, we return 1. Otherwise, we return 0.