Fondamenti di Informatica - Compito A

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Exercise (6 points)

Write a recursive function in language C with the following interface

```
int Hindex(int C[], int n);
```

Function $Hindex$ considers only the part of the array C between the indexes 0 and n, and returns the largest number x such that $C[x] \geq x$, assuming that the array C is sorted in **decreasing** order.

For example, if the array C contains:

14	13	10	8	5	3	2	1

then $Hindex(C, 6)$ returns 4; in fact $C[4] \geq 4$, while it is not true that $C[5] \geq 5$.

Afterwards, show how the following program (that invokes the function defined earlier) is executed, by showing the activation records.

```
int f(int C[], int *k, int n)
{       int i=0;

        C[0]= *k;
        while (C[i]>0)
        {
                *k = *k/2;
                i++;
                C[i]= *k;
        }
        return Hindex(C,n);
}

main()
{
        int C[5], r, k=14, n=4;
        r=f(C,&k,n);
}
```

Solution

Code of the function:

```
int Hindex(int C[], int n)
{
        if (C[n]>=n)
                return n;
        else
                return Hindex(C,n-1);
}
```