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Actividad 5.1 Programación Lógica
Implementación de métodos computacionales
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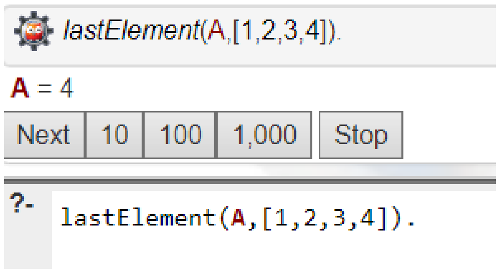
5.- Write a predicate last/2 which takes a list as its first argument and returns the last element of the list.

```
lastElement(A,[A]).

lastElement(A,[_|B]) :- lastElement(A,B).
```



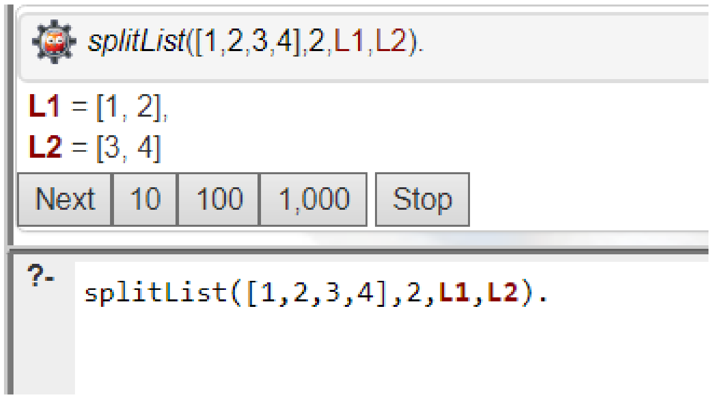
```
lastElement(A,[1,2,3,4]).
A = 4
```

```
?- lastElement(A,[1,2,3,4]).
```

6.- Write a predicate split/4that splits a lis tintotwo parts, the length of the first part is given.

```
splitList(A,0,[],A).

splitList([B|Bs],C,[B|Ds],Es) :- C > 0, C1 is C - 1, splitList(Bs,C1,Ds,Es).
```



```
splitList([1,2,3,4],2,L1,L2).
L1 = [1, 2],
L2 = [3, 4]
```

```
?- splitList([1,2,3,4],2,L1,L2).
```

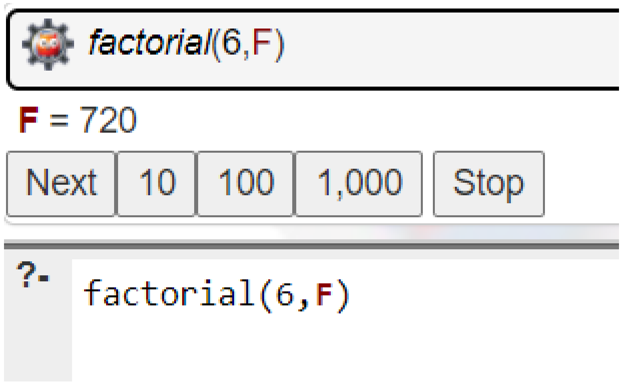
7. Write a predicate fact/2which takes a natural number as first argument, and returns the factorial of the number.

factorial(0,1).

factorial(N, F):-

N > 0,

N1 is N-1, factorial(N1, F1), F is N * F1.



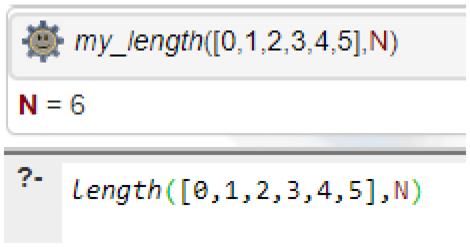
```
factorial(6,F)
F = 720
```

```
?- factorial(6,F)
```

9. Write a predicate length2/2 which takes a list as first argument, and returns in the second one the number of elements in the list.

length([],0).

length([_|L],N) :- my_length(L,N1), N is N1 + 1.



```
my_length([0,1,2,3,4,5],N)
N = 6
```

```
?- length([0,1,2,3,4,5],N)
```

16. Define sum/2 to take a list of integers as input and return the output as their sum.

sum(L, N):-

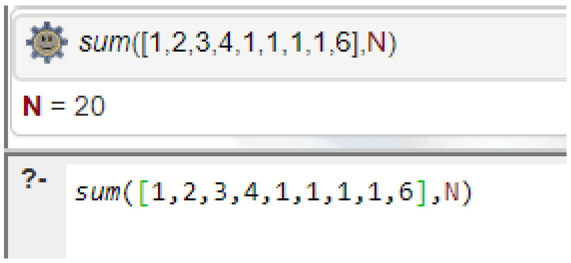
   sum(L, 0, N).

sum([],N,N).

sum([H|T],A,N) :-

A1 is A + H,

sum(T,A1,N).

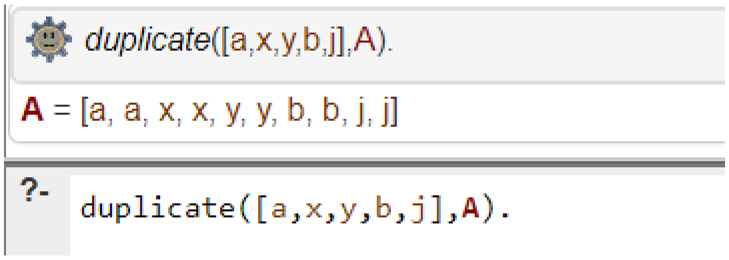


```
sum([1,2,3,4,1,1,1,1,6],N)
N = 20
?- sum([1,2,3,4,1,1,1,1,6],N)
```

18. Write a predicate dupli/2which takes two inputs: the first is a list, and the second will be the list with every element duplicated.

duplicate([],[]).

duplicate([A|As],[A,A|Bs]) :- duplicate(As,Bs).



```
duplicate([a,x,y,b,j],A).
A = [a, a, x, x, y, y, b, b, j, j]
?- duplicate([a,x,y,b,j],A).
```

20. Write a predicate npli/3which takes threeinputs: the first is a list, the second is the number of times that every elements will be copied and the third element is the new list.

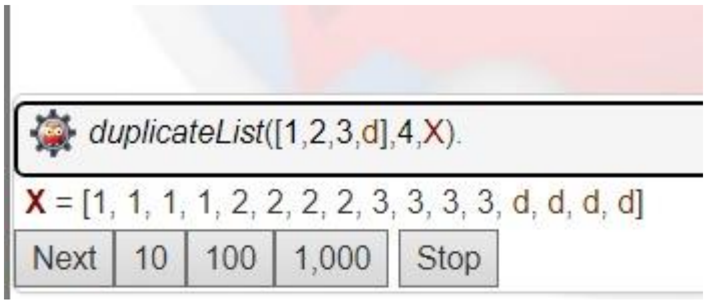
duplicateList(L1,N,L2) :- duplicateList(L1,N,L2,N).

duplicateList([],,[],).

duplicateList([_|As],B,Cs,0) :- duplicateList(As,B,Cs,B).

duplicateList([A|As],B,[A|Cs],D) :- D > 0, D1 is D - 1, duplicateList([A|As],B,Cs,D1).

duplicateList([1,2,3,d],4,X).



```
duplicateList([1,2,3,d],4,X).
```

```
X = [1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, 3, d, d, d, d]
```