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Actividad 5.1 Programación lógica

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

```
sum([], 0).
sum([Head|Tail], Result) :-
    sum(Tail, SumTotal),
    Result is Head + SumTotal.
```

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.

```
dupli([],[]).
dupli([Head|Tail],[Head,Head|Tailnew]) :-
    dupli(Tail,Tailnew).
```

19. Write a predicate split/4that splits a list in two parts, the length of the first part is given.

```
split(L,0,[],L).
split(L,0,[],L).
split([Head|Tail],N,[Head|Tailnew],Newl) :-
  N > 0,
  N1 is N - 1,
  split(Tail,N1,Tailnew,Newl).
```

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

```
fact(0,1).
fact(N, F):-
    N > 0,
    N1 is  N - 1,
    fact(N1, F1),
    F is N * F1.
```

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10. Write a predicate power which takes a number as first argument, a natural number as second argument and returns the first number to the power of the second.

```
power(0, 0, _):-
    print(infinito).

power(A, 0, 1):-
    A =\= 0.

power(A, 1, A).

power(A, B, P):-
    B >= 2,
    B1 is B - 1,
    power(A, B1, P1),
    P is A * P1.
```

5. Write a predicate last/2which takes a list as its first argument and returns the last element of the list.

```
last([X],X).
last([_|L],X) :- last(L,X).
```

6. Write a predicate max/3which takes three arguments, the first two are positive integer numbers and returns in the third the max of them.

```
max(X,Y,X) :- X>=Y.
max(X,Y,Y) :- X<Y.
```