**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.

**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.