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Actividad 5.1 Programación Lógica

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

fact(0, 1).

fact(X, R) :- X > 0, X1 is X-1, fact(X1, R2), R is R2*X.

The screenshot shows the SWISH Prolog IDE interface. On the left, the program editor contains the following code:

```
1 fact(0, 1).
2 fact(X, R) :- X > 0, X1 is X-1, fact(X1, R2), R is R2*X.
```

On the right, the execution console shows the results of several queries:

- fact(1, X) → X = 1, false
- fact(2, X) → X = 2, false
- fact(3, X) → X = 6, false
- fact(4, X) → X = 24, false
- fact(5, X) → X = 120, false

Below these, a query is shown with a placeholder for the result: `?- fact(5, X)`. The bottom of the interface includes tabs for Examples, History, and Solutions, along with a checkbox for 'table results' and a 'Run' button.

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

sum([], 0).

sum([Head|Tail], R) :-

sum(Tail, SumTail),

R is Head + SumTail.

The screenshot shows the SWISH Prolog IDE interface. On the left, the program editor contains the following code:

```
1 sum([], 0).
2 sum([Head|Tail], R) :-
3   sum(Tail, SumTail),
4   R is Head + SumTail.
5
```

On the right, the execution console shows the results of several queries:

- sum([5, 10, 20], X) → X = 35
- sum([1, 2, 3, 4, 5, 6], X) → X = 21

Below these, a query is shown with a placeholder for the result: `?- sum([1, 2, 3, 4, 5, 6], X)`. The bottom of the interface includes tabs for Examples, History, and Solutions, along with a checkbox for 'table results' and a 'Run' button.

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

`split(L,0,[],L).`

`split([Head|TailX],N,[Head|TailY],List2) :- N > 0, N1 is N - 1, split(TailX,N1,TailY,List2).`

The screenshot shows the SWISH Prolog IDE interface. The top menu bar includes 'File', 'Edit', 'Examples', and 'Help'. The top right corner shows '242 users online' and a search bar. The main editor area on the left contains the following Prolog code:

```
1. split(L,0,[],L).
2. split([Head|TailX],N,[Head|TailY],List2) :- N > 0, N1 is N - 1, split(TailX,N1,TailY,List2).
```

The right-hand pane displays the results of several test queries:

- Query: `split([1,2,3,4],3,X,Y)`
Results: `X = [1,2,3]`, `Y = [4]`, `false`
- Query: `split([1,2,3,4,7,8,9,10],3,X,Y)`
Results: `X = [1,2,3]`, `Y = [4,7,8,9,10]`, `false`
- Query: `split([1,2,3,4,7,8,9,10],6,X,Y)`
Results: `X = [1,2,3,4,7,8]`, `Y = [9,10]`, `false`
- Query: `split([],0,X,Y)`
Results: `X = Y = []`

At the bottom of the right pane, there is a prompt `?- split([],0,X,Y)` and a 'Run' button. The bottom of the interface includes tabs for 'Examples', 'History', and 'Solutions', along with a 'table results' checkbox and a 'Run' button.