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UCS1524 - Logic programming

Assignment - 3

1. Delete last three elements using conc.

```
deletelast3(L, L1) :- conc(L1, [_, _, _], L)
```

2. Delete first and last 3 elements.

```
deletefirstlast3([_, _, _ | End], Middle) :- append(
                                    Middle, [_, _, _], End).
```

3. Relation to add item at last.

```
addend(X, L, L1) :- conc(L, [X], L1).
```

4. Relation to remove all items from list.

```
del_all(_, [], []).
delall(Item, [Item | Rest], RRest) :- !,
    delall(Item, Rest, RRest).
del_all(Item, [OtherItem | Rest], [OtherItem | RRest]) :-
    delall(Item, Rest, RRest).
```

5. Relation to reverse a list.

```
reverse([], Y, R) :- R = Y
reverse([H | T], Y, R) :- reverse(T, [H | Y], R).
```

6. palindrome predicate:

```
accRev([], A, A).
accRev([H|T], A, R) :- accRev(T, [H|A], R).
rev(L, R) :- accRev(L, [], R).
palindrome(List) :- rev(List, List).
```

7. maximum of 2 element.

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

8. Find max in a list.

```
maxlist([X], X)
maxlist([X, Y|Rest], max) :- maxlist([Y|Rest],
    MaxRest), max(X, MaxRest, Max).
```

9. Find sum of list.

```
sumlist([], 0)
sumlist([_|Tail], sum) :- sumlist(Tail, Sum),
                          Sum is Sum + sum
```

10. Find if list is ordered.

```
ordered([X])
ordered([X, Y|Tail]) :- X <= Y, ordered([Y|
                                Tail]).
```

11. Factorial of a number:-

```
factorial(0, 1).
factorial(N, M) :- N > 0, N1 is N - 1, factorial(N1, M1),
                   M is N * M1
```

12. Sum of odd / even number in a list.

```
iseven(N):- 0 is mod(N,2).
sum([],[0,0])
sum([H|T],[even,odd]):- sum(T,[even,odd]),
        iseven(H), even is even1+H
sum([H|T],[even,odd]):- sum(T,[even,odd]),
        odd is odd1+H
```

13. Make a given list into palindrome.

```
reverse([],Y,R):- R = Y
reverse([H|T],Y,R):- reverse(T,[H|Y],R).
makepalindrome(X,L):-reverse(X,Y,R),
        conc(X,R,L).
```