Assignment 10

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1. Implement function in PROLOG. Write a program to compute the area of a rectangle, and the volume of a sphere using PROLOG. [30]

Prog1.pl

```
rect_area( L , B , Area ) :-
    Area is L * B.

vol_sphere( R , Volume ) :-
    Volume is 3.14 * (4/3) * R * R * R.
```

```
?- vol_sphere(2, Volume).
Volume = 33.493333333333.

?- rect_area(10, 20, Area).
Area = 200.
```

2. Implement LIST in PROLOG. Read n elements from the keyboard and store them in a LIST. Further, print the even numbers only from the LIST. [50]

Prog1.pl | Prog2.pl

```
read_elements(0, []) :- !.
read_elements(N, [X | Rest]) :-
    N > 0,
    write('Enter an element: '),
    read(X),
    N1 is N - 1,
    read_elements(N1, Rest).


print_even([]).
print_even([X | Rest]) :-
    0 is X mod 2,
    write(X), write(' '),
    print_even(Rest).
print_even([_ | Rest]) :-
    print_even(Rest).


main :-
    write('Enter the number of elements: '),
    read(N),
    read_elements(N, List),
    write('Even numbers in the list: '),
    print_even(List).
```

```
?- main.
Enter the number of elements: 5.
Enter an element: |: 1.
Enter an element: |: 2.
Enter an element: |: 3.
Enter an element: |: 4.
Enter an element: |: 5.
Even numbers in the list: 2 4
true .
```

3. Implement recursive function in PROLOG. Print the numbers from 1 to N, using recursion. Read N from the keyboard. [20]

Prog1.pl | Prog2.pl | Prog3.pl

```
print_numbers(N) :- N >= 1, print_numbers_recursive(1, N).
print_numbers_recursive(N, N) :-
    write(N), nl.
print_numbers_recursive(Current, N) :-
    write(Current), write(' '),
    Next is Current + 1,
    print_numbers_recursive(Next, N).

prog3 :-
    write('Enter a positive integer N: '),
    read(N),
    (N > 0 -> print_numbers(N); write('N must be a positive integer.')).
```

```
?- prog3.
Enter a positive integer N: 6.
1 2 3 4 5 6
true .
```