

Practical – 5

- Implement following prolog programs based on list:
 1. To display first element of a list.
 2. To display last element of a list.
 3. To display all elements of a list.
 4. To display elements up to specified index of a list.
 5. To count number of elements in a list.
 6. To count odd and even elements of a list.

1. To display first element of a list.

```
list([]).  
list([A|_]) :-  
    write("First element is : "),write(A).
```

Output:

```
?- list([1,2,3,4,5,6,7,8,9,10]).  
First element is : 1  
true.  
?- ■
```

2. To display last element of a list.

```
list([_|T]):-  
    T \= [], list(T).  
  
list([H|_]):-  
    write("Last element is : "),  
    write(H).
```

Output:

```
[1] ?- list([1,2,3,4,5,6]).  
Last element is : 6  
true ■
```

3. To display all elements of a list.

```
list([H|T]):-  
    nl,write(H),list(T).
```

Output:

```
[2] ?- list(['hii','hello','how','are','you']).  
hii  
hello  
how  
are  
you
```

4. To display elements up to specified index of a list.

```
list(List, Index):-  
    display_elements(List, Index, 0).
```

```
display_elements([H|T], Index, C):-  
    H \= [], C < Index -> (nl, write(H), display_elements(T, Index, C+1)); !.
```

Output:

```
[3] ?- list([1,2,3,4,5,6,7,8,9],4).  
1  
2  
3  
4  
true.
```

5. To count number of elements in a list.

```
list(List):-  
    count(List, 0).  
  
count([], C):-  
    nl,write("Total number of elements in list : "),write(C).  
  
count([_|T], C):-  
    C1 is C+1,  
    count(T, C1).
```

Output:

```
[3] ?- list([1,2,3,4,5,6,7,8,9,10]).  
  
Total number of elements in list : 10  
true.
```

6. To count odd and even elements of a list.

```
list(List):-  
    count(List, 0, 0).  
  
count([], Odd, Even):-  
    nl, write("Total odd elements : "),write(Odd),
```

```
nl, write("Total even elements : "),write(Even).
```

count([H|T], Odd, Even):-

```
H mod 2 =:= 0 -> (Even1 is Even+1, count(T, Odd, Even1));  
(Odd1 is Odd+1, count(T, Odd1, Even)).
```

Output:

```
[3] ?- list([1,2,3,4,5,6,7,8,9,10]).  
Total odd elements : 5  
Total even elements : 5  
true.
```