Experiment No: 6

Title: Prolog Programming Set 1

Objective: To get acquainted with logical programming

Implement

1. **Hello, World! program**

   Code:

```
main:-
        process,
        halt.

process:-
        write('Hello World').
:- main.
```

   Output:

```
Hello World

...Program finished with exit code 0
Press ENTER to exit console.
```

2. **Program to check if an element is a member of a list**

   Code:

```
member(X, [X|_]).
member(X, [_|T]) :- member(X, T).
```

   Output:

true

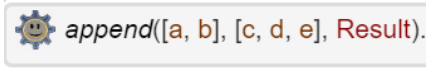
false

3. **Program to append two lists**

   Code:

```
append([], L, L).
append([H|T], L, [H|Result]) :- append(T, L, Result).
```

   Output:



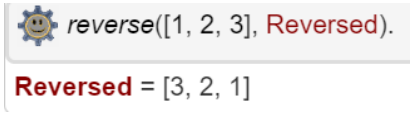
Result = [a, b, c, d, e]

4. **Program to reverse a list**

Code:

```
reverse([], []).
reverse([H|T], Reversed) :- reverse(T, Result), append(Result, [H], Reversed).
```

Output:

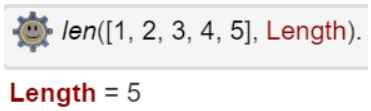


5. **Program to find the length of a list**

Code:

```
len([], 0).
len([_|T], N) :- len(T, N1), N is N1 + 1.
```

Output:

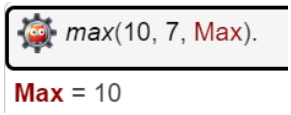


6. **Program to find the maximum of two numbers**

Code:

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

Output:

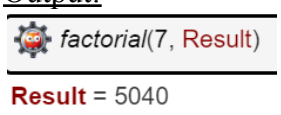


7. **Program to find the factorial of a number**

Code:

```
factorial(0, 1).
factorial(N, Result) :-
  N > 0,
  N1 is N - 1,
  factorial(N1, Result1),
  Result is N * Result1.
```

Output:

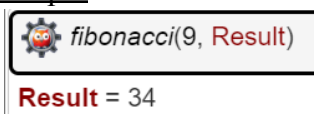


8. **Program to find the nth Fibonacci number**

Code:

```
fibonacci(0, 0).
fibonacci(1, 1).
fibonacci(N, Result) :-
  N > 1,
  N1 is N - 1,
  N2 is N - 2,
  fibonacci(N1, Result1),
  fibonacci(N2, Result2),
  Result is Result1 + Result2.
```

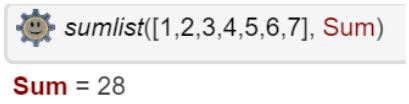
Output:



9. **Program to find the sum of a list of numbers**

Code:

```
sumlist([], 0).
sumlist([H|T], Sum) :-
  sumlist(T, Sum1),
  Sum is H + Sum1.
```



10. **Program to find the smallest element in a list.**

Code:

```
smallest([X], X).
smallest([H|T], X) :-
  smallest(T, X1),
  (H < X1 -> X = H ; X = X1).
```

Output: