Experiment Number: 07

Aim: To design a solution using prolog based code.

Lab Objective: Design and implement declarative programs in functional and logic programming languages.

Lab Outcome Mapped: Design and Develop solution based on declarative programming paradigm using functional and logic programming.

Requirements: Online/Browser based Prolog IDE provided by SWI Prolog release

Procedure : As part of this experiment students are suppose to design prolog solutions to some sample computational problems and understand how to solve them using swi prolog. For each of following code student need to type the code into a .pl file, save it and consult the file in swipl shell and query appropriately and note the results student need to briefly discuss what the code is doing. Student need to express the same computation using any imperative programming code c,c++ or Java.

Code 1: */* File name : read.pl */*
```
hello :-
write('What is your name ?'),
read(X),
write('Hello'), tab(1), write(X).
```

Code 2: */* File name : loop.pl */*
```
loop(0).
loop(N) :- N>0, write('value of N is: '), write(N), nl,
X is N-1, loop(X).
```

Code 3: */* File Name : grade.pl */*
```
grade(G,a):-G>90.
grade(G,b):-G>80.
grade(G,c):-G>70.
grade(G,d):-G>60.
grade(_,f).
```

Code 4: */* File Name : nsum.pl */*
```
/* sum of integers from 1 to N inclusive */
sumto(1, 1).
sumto(N, M) :- N>1, N1 is N-1, sumto(N1, M1), M is M1+N.
```

Code 5 : */* File Name : factorial.pl */*
```
factorial(0,1).
factorial(N,F) :-
    N>0,
    N1 is N-1,
```

```
       factorial(N1,F1),
       F is N * F1.
```

Code 6 : /* *File Name : Fibonacci.pl* */

```
    fib(0, 1) :- !.
    fib(1, 1) :- !.
    fib(N, F) :-
         N > 1,
         N1 is N-1,
         N2 is N-2,
         fib(N1, F1),
         fib(N2, F2),
         F is F1+F2.
```

Code 7: /* *file name : append.pl* */
```
    append([], Bs, Bs).
    append([A|As], Bs, [A|Cs]) :-append(As, Bs, Cs).
```

Conclusion: We have learned how to do logic programming using SWI Prolog.

Reference:
1. Link for SWI Prolog online editor: https://swish.swi-prolog.org/example/examples.swinb
2. Prolog Tutorial: https://www.swi-prolog.org/pldoc/man?section=quickstart