Artificial Intelligence CS791

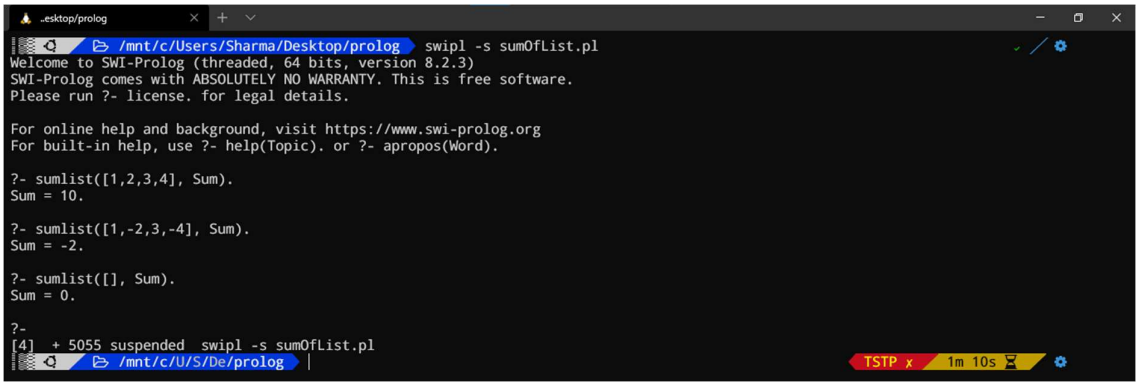
Name: Kumar Shivam, Roll: 08, Enrollment Number: 12017009001351

1. **Write a prolog program to compute the sum of the list.**

CODE:

```
sumlist([], 0).
sumlist([H|T], Sum) :- sumlist(T, N1), Sum is N1+H.
```

OUTPUT:



2. **Write a prolog program to find fibonacci series.**

CODE:

```
fib_seq(0,[0]).
fib_seq(1,[0,1]).
fib_seq(N,Seq) :-
  N > 1,
  fib_seq_(N,SeqR,1,[1,0]),
  reverse(SeqR,Seq).

fib_seq_(N,Seq,N,Seq).
fib_seq_(N,Seq,N0,[B,A|Fs]) :-
  N > N0,
  N1 is N0+1,
  C is A+B,
  fib_seq_(N,Seq,N1,[C,B,A|Fs]).
```

OUTPUT:

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```
/mnt/c/U/S/De/prolog swipl -s fibonacci.pl                    TSTP x  2m 58s
Welcome to SWI-Prolog (threaded, 64 bits, version 8.2.3)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

For online help and background, visit https://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- fib_seq(5, L).
L = [0, 1, 1, 2, 3, 5] .

?- fib_seq(10, L).
L = [0, 1, 1, 2, 3, 5, 8, 13, 21|...] ;
false.

?- fib_seq(3, L).
L = [0, 1, 1, 2]
```

3. Write a prolog program to union of two list X and Y.

CODE:

```
union([],[],[]).
union(List1,[],List1).
union(List1, [Head2|Tail2], [Head2|Output]):-
  \+(member(Head2,List1)), union(List1,Tail2,Output).
union(List1, [Head2|Tail2], Output):-
  member(Head2,List1), union(List1,Tail2,Output).
```

OUTPUT:

```
/mnt/c/Users/Sharma/Desktop/prolog swipl -s union.pl
Welcome to SWI-Prolog (threaded, 64 bits, version 8.2.3)
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For online help and background, visit https://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- union([1,5,6], [2,3,9], X).
X = [2, 3, 9, 1, 5, 6] .

?- union([1,5,1], [2,11,0], X).
X = [2, 11, 0, 1, 5, 1] .
```

4. Write a prolog program to divide a list in two list which are appropriately of same length.

CODE:

```
div([],[],[]).
div([X],[X],[]).
div([X,Y|List],[X|List1],[Y|List2]):- div(List,List1,List2).
```

OUTPUT:

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