

Name : Harshang Nareshkumar Makwana

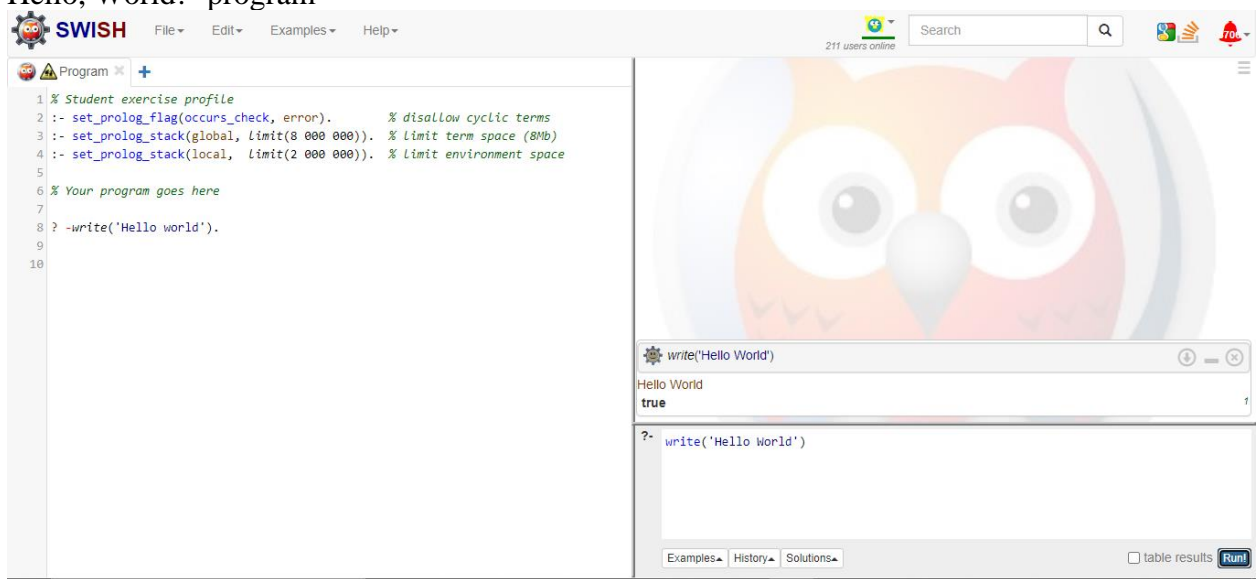
Roll No : 9207 , Comp_A

Experiment No: 6

Title: Prolog Programming Set 1

Objective: To get acquainted with logical programming
Implement

1. Hello, World!" program



The screenshot shows the SWISH Prolog IDE interface. The left pane contains the Prolog code for a 'Hello World' program. The right pane shows the execution output, which includes the text 'Hello World' and the result 'true'.

```
1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error).    % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local,  limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7
8 ? -write('Hello world').
9
10
```

Execution output:

```
write('Hello World')
Hello World
true
```

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

The SWISH Prolog IDE interface displays a program in the left pane and its execution results in the right pane. The program defines a `list_member` predicate. The right pane shows two queries: the first returns `false` and the second returns `true`. A query history window is also visible, showing the second query and its result.

```

1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7 list_member(X,[_]).
8 list_member(X,[_:TAIL]) :- list_member(X,TAIL).
9

```

Query 1: `list_member('crce',['Harshang','Makwana'],'AI')`
 Result: `false`

Query 2: `list_member('AI',['Harshang','Makwana'],'AI')`
 Result: `true`

Query History: `?- list_member('AI',['Harshang','Makwana'],'AI')`

3. Program to append two lists

The SWISH Prolog IDE interface displays a program in the left pane and its execution results in the right pane. The program defines a `concat` predicate. The right pane shows two queries: the first defines `NewList` and the second uses it. A query history window is also visible, showing the second query and its result.

```

1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7
8 concat([],L,L).
9 concat([X1|L1],L2,[X1|L3]) :- concat(L1,L2,L3).
10

```

Query 1: `concat(['Harshang','Makwana'],['crce','9207'],NewList)`
 Result: `NewList = ['Harshang', 'Makwana', 'crce', '9207']`

Query 2: `concat(['Harshang','Makwana'],['crce','9207'],NewList)`

4. Program to reverse a list

The SWISH Prolog IDE interface displays a program for reversing a list. The editor on the left contains the following code:

```

1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7
8 list_concat([],L,L).
9 list_concat([X1|L1],L2,[X1|L3]) :- list_concat(L1,L2,L3).
10
11 list_rev([],[]).
12 list_rev([Head|Tail],Reversed) :-
13     list_rev(Tail, RevTail),list_concat(RevTail, [Head],Reversed).
14

```

The right-hand pane shows the execution of the query `list_rev([a,b,c,d,e],NewList).`. The result is displayed as `NewList = [e, d, c, b, a]`. The interface also includes a search bar, a user count (228 users online), and buttons for Examples, History, Solutions, and a Run button.

5. Program to find the length of a list

The SWISH Prolog IDE interface displays a program for finding the length of a list. The editor on the left contains the following code:

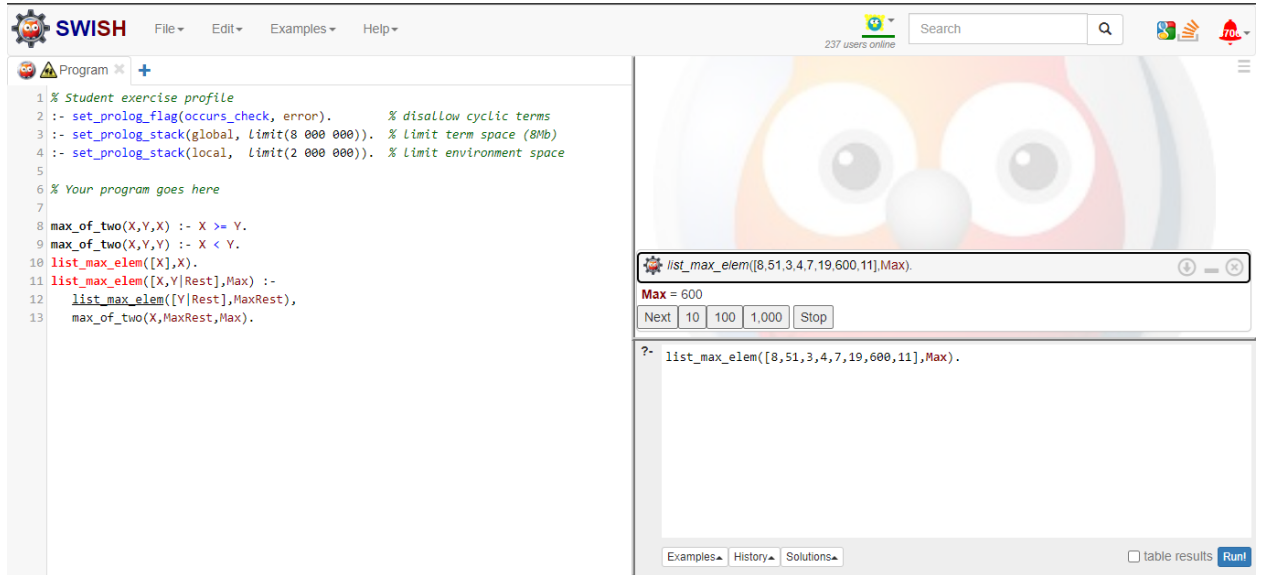
```

1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7
8 len([],0).
9 len([_|TAIL],N) :-
10     len(TAIL,N1),N is N1+1 .

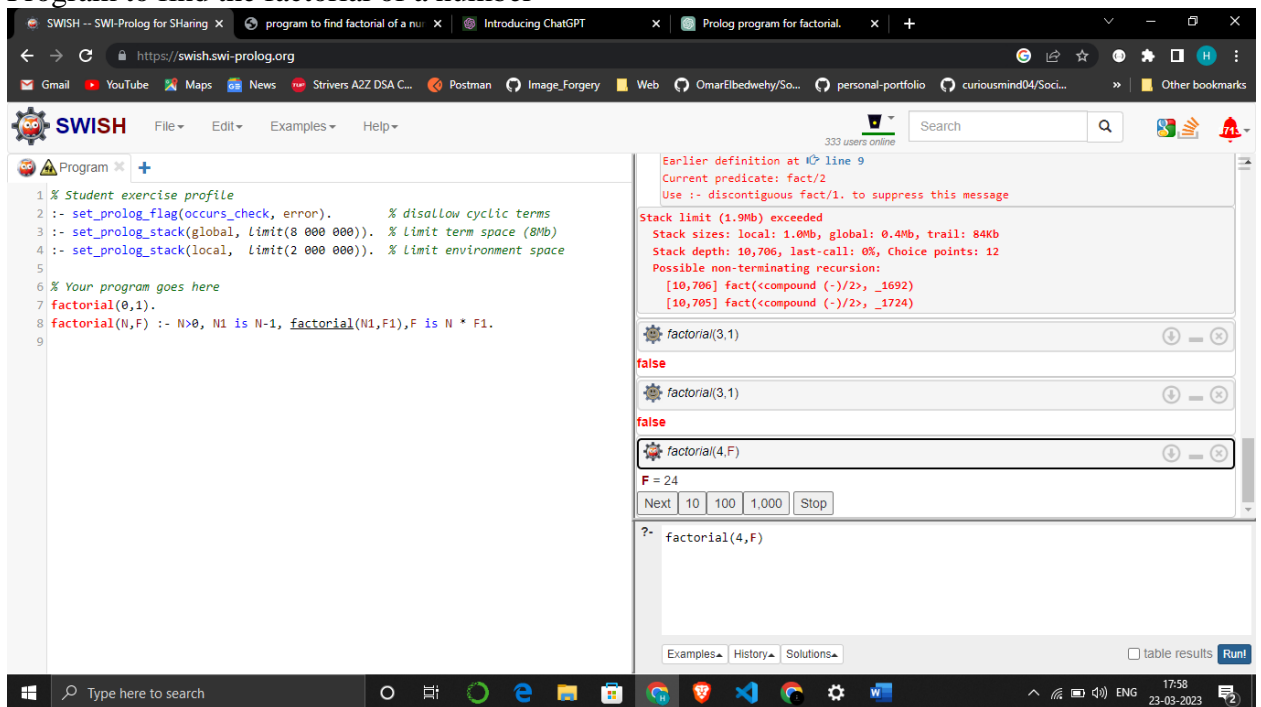
```

The right-hand pane shows the execution of the query `len([a,b,c,d,e,f,g,h,i,j],Len).`. The result is displayed as `Len = 10`. The interface also includes a search bar, a user count (221 users online), and buttons for Examples, History, Solutions, and a Run button.

6. Program to find the maximum of two numbers



7. Program to find the factorial of a number



8. Program to find the nth Fibonacci number

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program to find factorial of a nu

Introducing ChatGPT

Prolog program for factorial.

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Program

```

1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7 fibonacci(0,0).
8 fibonacci(1,1).
9 fibonacci(N,F) :- N > 1, N1 is N-1, N2 is N-2, fibonacci(N1,F1), fibonacci(N2,F2), F is
10
11

```

fibonacci(4,F)

F = 3

Next 10 100 1,000 Stop

fibonacci(9,F)

F = 34

Next 10 100 1,000 Stop

fibonacci(5,F)

F = 5

Next 10 100 1,000 Stop

?- fibonacci(5,F)

Examples History Solutions

table results Run!

Type here to search

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

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Program

```

1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7 list_sum([],0).
8 list_sum([Head|Tail], Sum) :-
9     list_sum(Tail, SumTemp),
10    Sum is Head + SumTemp.

```

list_sum([1,2,3,4,5,6,1,1,10], Sum).

Failed to set breakpoint at line 7

Sum = 33

?- list_sum([1,2,3,4,5,6,1,1,10], Sum).

Examples History Solutions


table results Run!

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

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Program

```
1 % Student exercise profile
2 :- set_prolog_flag(occurs_check, error). % disallow cyclic terms
3 :- set_prolog_stack(global, limit(8 000 000)). % limit term space (8Mb)
4 :- set_prolog_stack(local, limit(2 000 000)). % limit environment space
5
6 % Your program goes here
7 smallest([X], X).
8 smallest([X,Y|Tail], Smallest) :- X < Y,smallest([X|Tail], Smallest).
9 smallest([X,Y|Tail], Smallest) :- X > Y,smallest([Y|Tail], Smallest).
10
11
```



smallest([10,20,-1,2,1000],Small).

Small = -1

Next 10 100 1,000 Stop

?- smallest([10,20,-1,2,1000],Small).

Examples History Solutions

☐ table results **Run!**

Type here to search

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