

UCT31021 - PRACTICAL FOR ARTIFICIAL INTELLIGENCE
DEPARTMENT OF ICT
FACULTY OF TECHNOLOGY

SOUTH EASTERN UNIVERSITY OF SRILANKA

Labsheet: 01

Date: 10.07.2024

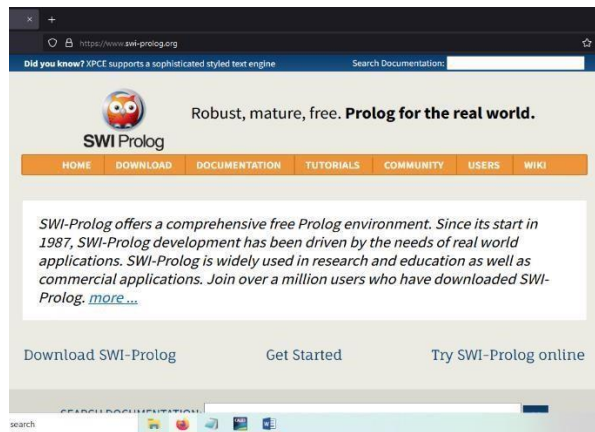
Title : Introduction to PROLOG

Aims :

- To introduce main components in logic Programming
- To get familiar with Data objects.
- Read user input.

Task 01: Download setup file and installation.

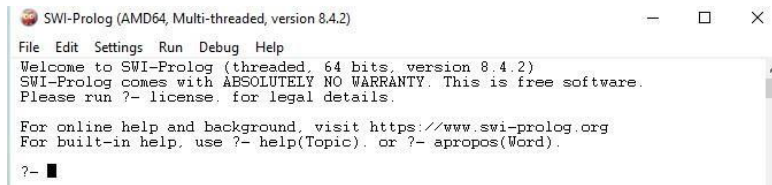
1. Visit the official website - <https://www.swi-prolog.org/>



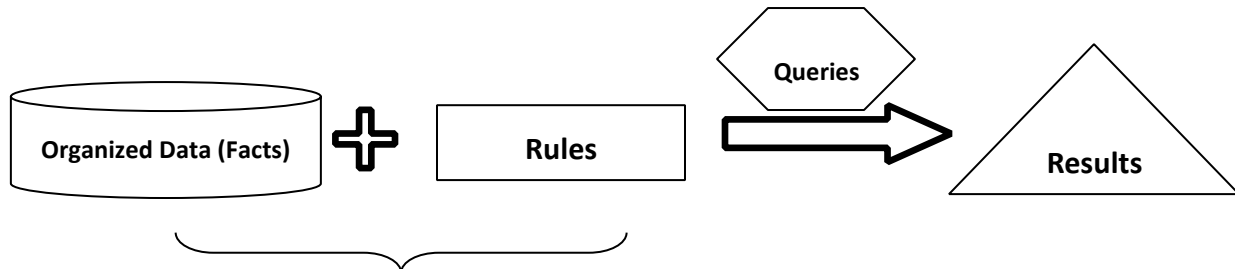
2. Modify the system path by adding swipl location.



3. Prolog console

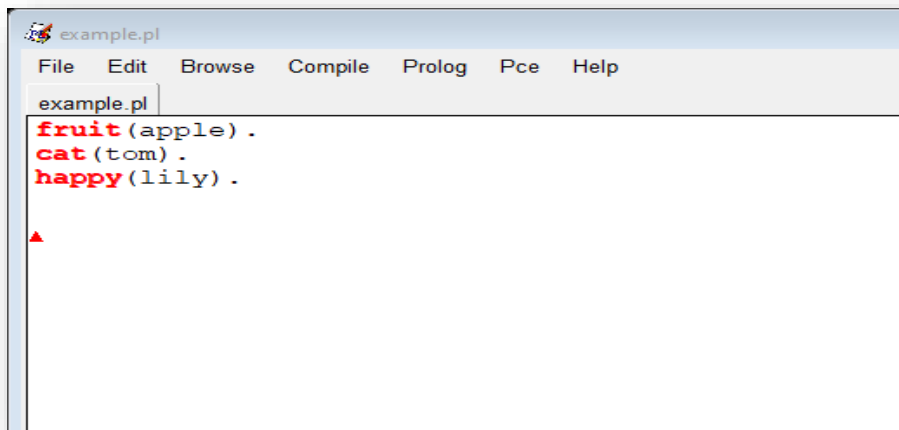


Introduction:

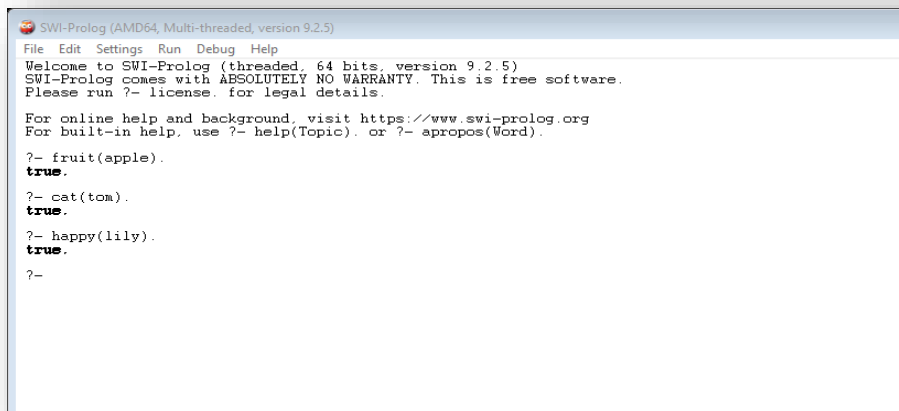


Knowledge Base / Clauses Example:

Fact	Rules	Query
Apple is a fruit	X is eatable if it is a fruit.	Is apple a fruit?
Tom is a cat	Tom is hungry if he is searching for food.	Is tom a cat?
Lilli is happy	Lilli is happy if she is dance.	Is lilli happy?



```
example.pl
File Edit Browse Compile Prolog Pce Help
example.pl
fruit(apple).
cat(tom).
happy(lily).
▲
```



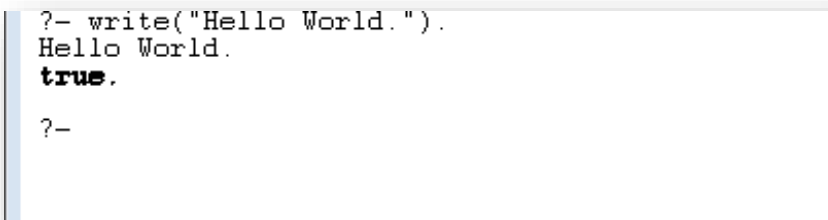
```
SWI-Prolog (AMD64, Multi-threaded, version 9.2.5)
File Edit Settings Run Debug Help
Welcome to SWI-Prolog (threaded, 64 bits, version 9.2.5)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

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

?- fruit(apple).
true.
?- cat(tom).
true.
?- happy(lily).
true.
?-
```

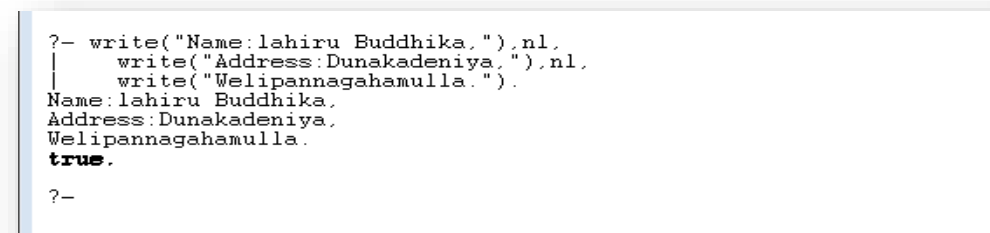
Task 02: Writing on the Console

1. Write a statement to Hello World.



```
?- write("Hello World. ").
Hello World.
true.
?-
```

2. Display your name and address in multiline.



```
?- write("Name:lahiru Buddhika."),nl,
| write("Address:Dunakadeniya."),nl,
| write("Welipannagahamulla. ").
Name:lahiru Buddhika.
Address:Dunakadeniya.
Welipannagahamulla.
true.
?-
```

3. Identify the currently working directory by “pwd.” Predicate

```
?- pwd.  
% c:/users/lahiru/documents/prolog/  
true.  
?-
```

4. Use “halt.” predicate or Ctrl+d to stop working of the PROLOG console.

```
?- halt.
```

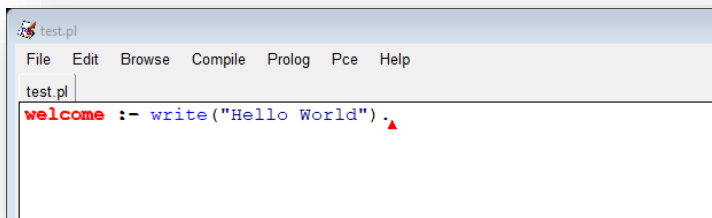
Task 03: Creating Knowledgebase

1. Create a knowledgebase and name it as test.pl in the working directory.

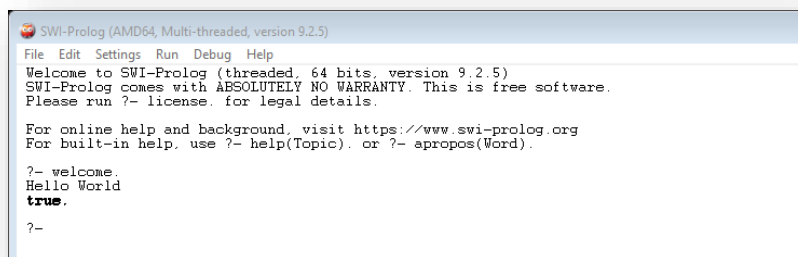
Open the prolog → Click on file → Click on new → Enter the file name as test.pl → Click on open

2. Insert the following code and save it.

Welcome :- write('Hello world.').



3. Type “welcome.” and observe the outcomes on the consoler.



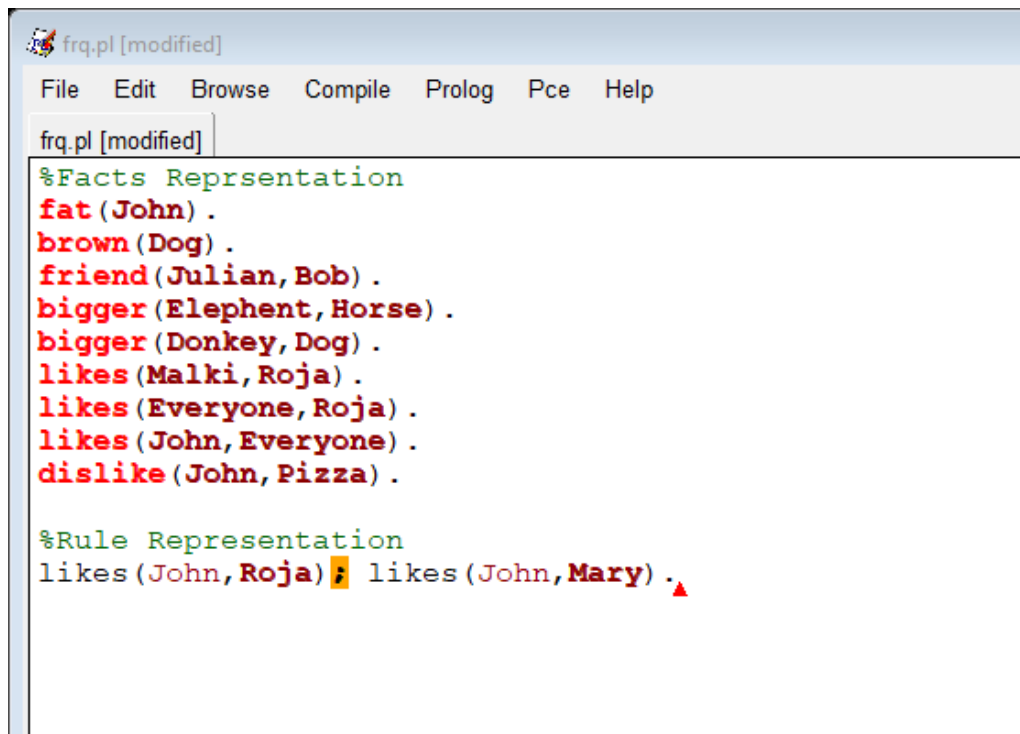
Task 04: Facts, rules and queries

Some syntax:

if	:-
and	,
or	;
not	not

1. Write down the relationship of given facts and rules.

- I. John is fat.
- II. Dog is brown.
- III. Julian is friend with bob. IV. Elephant is bigger than horse V. Donkey is bigger than dog. VI. Malki likes roja.
- VII. Everyone likes roja.
- VIII. John likes everyone.
- IX. John likes roja or john likes mary. X. John does not like pizza.



```
frq.pl [modified]
File Edit Browse Compile Prolog Pce Help
frq.pl [modified]
%Facts Representation
fat(John) .
brown(Dog) .
friend(Julian,Bob) .
bigger(Elephant,Horse) .
bigger(Donkey,Dog) .
likes(Malki,Roja) .
likes(Everyone,Roja) .
likes(John,Everyone) .
dislike(John,Pizza) .

%Rule Representation
likes(John,Roja) ; likes(John,Mary) .
```

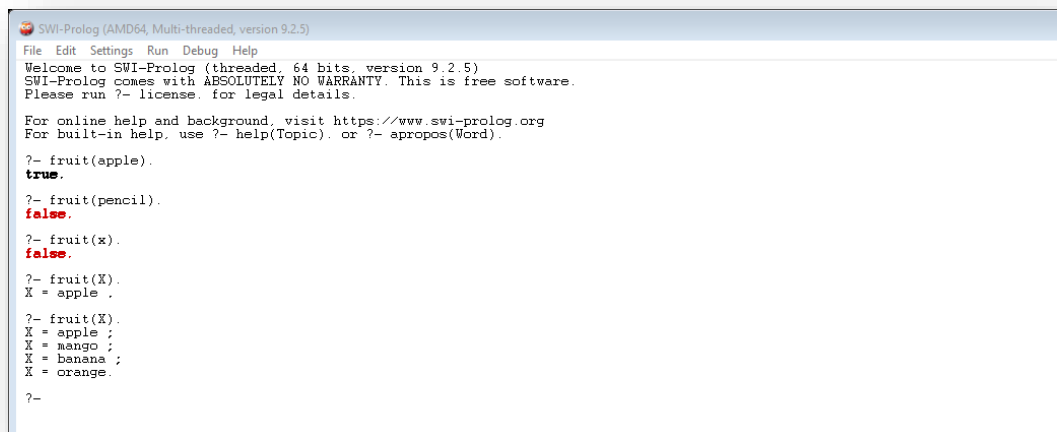
2. Create new knowledgebase file. Add following facts. Load the file into the PROLOG console.

fruit(apple). fruit(mango).

fruit(banana).

fruit(orange).

- I. Save the file and load into the PROLOG consoler.
- II. Check whether apple is a fruit. Use "fruit('apple')".
- III. Check whether pencil is a fruit.
- IV. Display available fruits which stored in the knowledgebase.



```
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?- fruit(apple).
true.
?- fruit(pencil).
false.
?- fruit(x).
false.
?- fruit(X).
X = apple ;
?- fruit(X).
X = apple ;
X = mango ;
X = banana ;
X = orange.
?-
```

To view all fruit type fruit(X) then it will show the first fruit after that press ";" semicolon to view the other fruit as well

Task 05: Data Objects

Data Objects	description	Example
Numbers	Integers and floats value	6, 4.32, -7.91
Atoms	Atoms do not have any numerical value. They can be any names/objects.	jackson, x64_yz, 'Jackson'
Variable	Start with capital letter and used it to hold a value.	X, Colour, Hi, and_123

1. Create three examples for each data object with different combinations.

```
task3.pl
File Edit Browse Compile Prolog Pce Help
task3.pl
num1(45).
num2(3.5).
num3(-1.2).
atom1(jackson).
atom3('Amal').
variables(X,Colour,Hi123) :- X=apple, Colour=blue , Hi123=123.
```

```
?- variables(X,Colour,Hi123).
X = apple,
Colour = blue,
Hi123 = 123.
?-
```

Task06: Read user input.

1. Use `read(VariableName)`. To read an user input.
Ex: myName
write('Enter your name: '),
read(Name),
write(Name).
2. Write a rule to request your name and it will welcome you to the Prolog Programming.
Output : Enter your name : XXX
Welcome XXX to Prolog Programming.

```
SWI-Prolog (AMD64, Multi-threaded, version 9.2.5)
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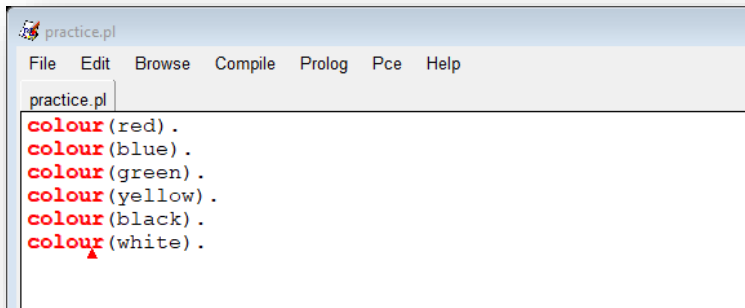
For online help and background, visit https://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- myName.
Enter your Nmae : lahiru
|: .
WelcomelahiruProlog Programming
true.
```

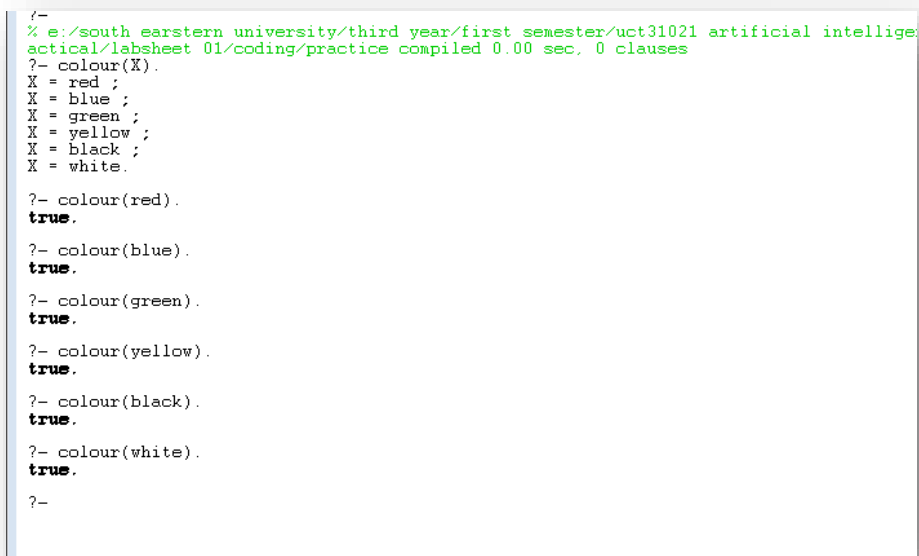
```
task4.pl
File Edit Browse Compile Prolog Pce Help
task4.pl
myName :- write("Enter your Nmae : "),
read(Name),
write("Welcome"),
write(Name),
write("Prolog Programming").
```

Practice Question:

1. Create new knowledgebase to display and identify 6 colors.



```
practice.pl
File Edit Browse Compile Prolog Pce Help
colour(red).
colour(blue).
colour(green).
colour(yellow).
colour(black).
colour(white).
```



```
% e:/south eastern university/third year/first semester/uct31021 artificial intelligence
actical/labsheet 01/coding/practice compiled 0.00 sec, 0 clauses
?- colour(X).
X = red ;
X = blue ;
X = green ;
X = yellow ;
X = black ;
X = white.
?- colour(red).
true.
?- colour(blue).
true.
?- colour(green).
true.
?- colour(yellow).
true.
?- colour(black).
true.
?- colour(white).
true.
?-
```

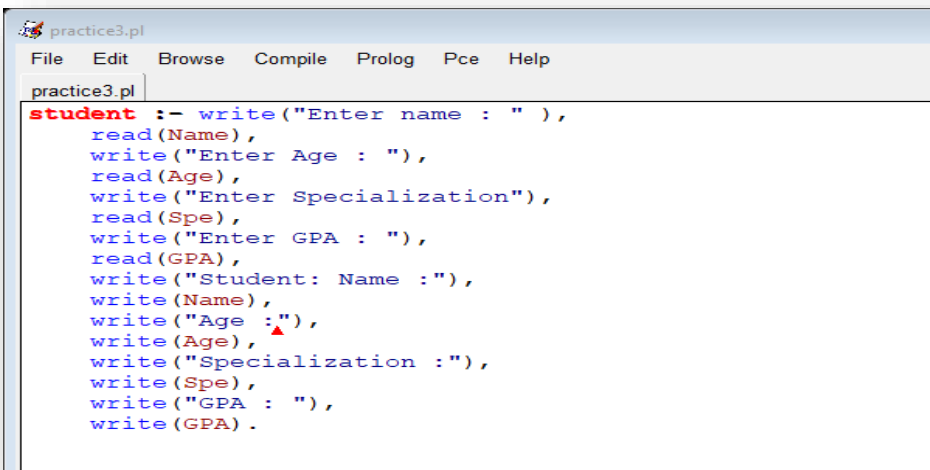
2. Create a knowledge base to store the following details.

Course code	Subject
CIS 11051	Database Design
CIS 21031	Platform Technology
UTC 31021	AI
CIS 41032	Advanced Database

Ex : CIS 11051 is Database Design.

3. Read user input command to display Student data Object and the student can have name, age, specialization and current_GPA.

```
?- student.  
Enter name : 'XXX'.  
Enter Age : |: 20.  
Enter Specialization : |: software.  
Enter GPA: |: 3.82.  
student: Name : XXX, Age: 20, Specialization: software, GPA : 3.82  
true.
```



```
practice3.pl  
File Edit Browse Compile Prolog Pce Help  
practice3.pl  
student :- write("Enter name : " ),  
            read(Name),  
            write("Enter Age : " ),  
            read(Age),  
            write("Enter Specialization"),  
            read(Spe),  
            write("Enter GPA : " ),  
            read(GPA),  
            write("Student: Name :"),  
            write(Name),  
            write("Age :"),  
            write(Age),  
            write("Specialization :"),  
            write(Spe),  
            write("GPA : " ),  
            write(GPA).
```

```
% e:/south eastern university/third year/first semester/uct31021 artificial intelligent practical/labsheet 01/coding/  
% e:/south eastern university/third year/first semester/uct31021 artificial intelligent practical/labsheet 01/coding/  
?-  
| student.  
Enter name : lahiru  
|:  
Enter Age : |: 24.  
Enter Specialization|: software.  
Enter GPA : |: 3.38  
|:  
Student: Name :lahiruAge :24Specialization :softwareGPA : 3.38  
true.  
?-
```