AI Lab Experiment-8

Implementation of knowledge representation schemes - use cases

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Prolog Code-

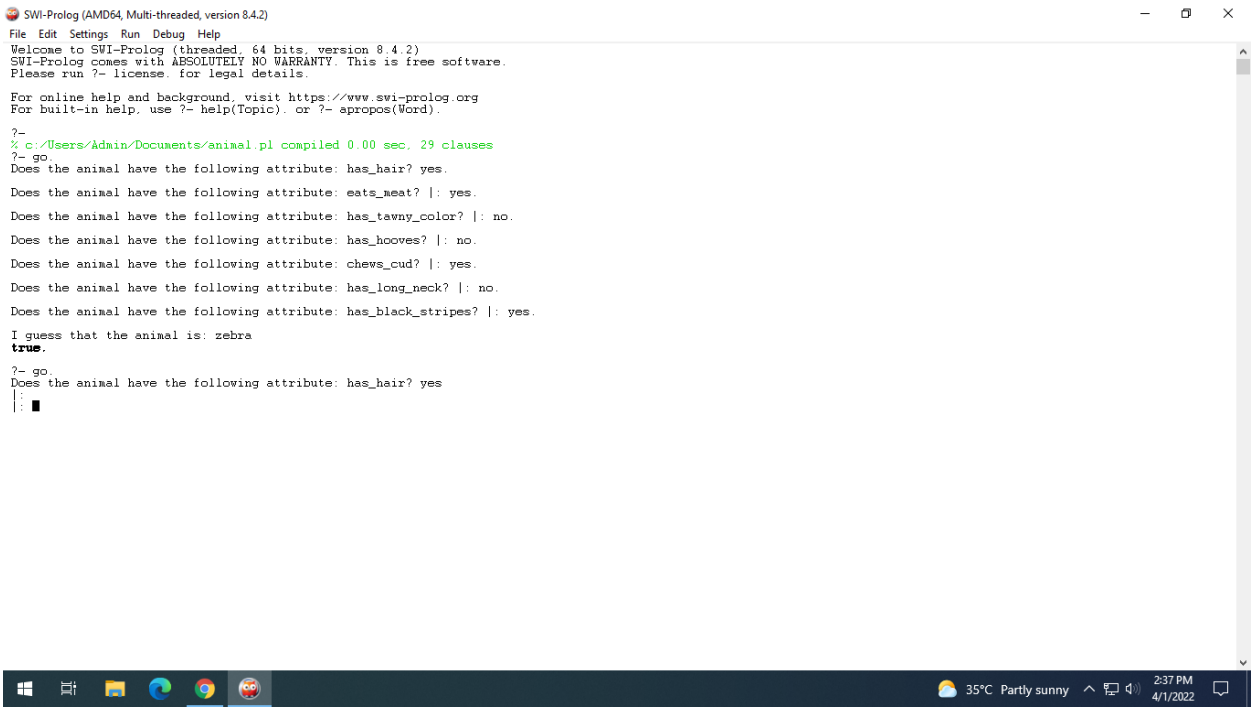
```
/* animal.pl
animal identification game.
start with ?- go. */
go :- hypothesize(Animal),
write(&#39;I guess that the animal is: &#39;),
write(Animal),
nl,
undo.
/* hypotheses to be tested */
hypothesize(cheetah) :- cheetah, !.
hypothesize(tiger) :- tiger, !.
hypothesize(giraffe) :- giraffe, !.
hypothesize(zebra) :- zebra, !.
hypothesize(ostrich) :- ostrich, !.
hypothesize(penguin) :- penguin, !.
hypothesize(albatross) :- albatross, !.
hypothesize(unknown). /* no diagnosis */
/* animal identification rules */
cheetah :- mammal,
carnivore,
verify(has_tawny_color),
verify(has_dark_spots).
tiger :- mammal,
```

```
carnivore,
verify(has_tawny_color),
verify(has_black_stripes).
giraffe :- ungulate,
verify(has_long_neck),
verify(has_long_legs).
zebra :- ungulate,
verify(has_black_stripes).
ostrich :- bird,
verify(does_not_fly),
verify(has_long_neck).
penguin :- bird,
verify(does_not_fly),
verify(swims),
verify(is_black_and_white).
albatross :- bird,
verify(appears_in_story_Ancient_Mariner),
verify(flys_well).
/* classification rules */
mammal :- verify(has_hair), !.
mammal :- verify(gives_milk).
bird :- verify(has_feathers), !.
bird :- verify(flys),
verify(lays_eggs).
carnivore :- verify(eats_meat), !.
carnivore :- verify(has_pointed_teeth),
verify(has_claws),
verify(has_forward_eyes).
ungulate :- mammal,

verify(has_hooves), !.
ungulate :- mammal,
verify(chews_cud).
/* how to ask questions */
ask(Question) :-
write(&#39;Does the animal have the following attribute: &#39;),
write(Question),
write(&#39;? &#39;),
```

```
read(Response),
nl,
( (Response == yes ; Response == y)
-&gt;
assert(yes(Question)) ;
assert(no(Question)), fail).
:- dynamic yes/1,no/1.
/* How to verify something */
verify(S) :-
(yes(S)
-&gt;
true ;
(no(S)
-&gt;
fail ;
ask(S))).
/* undo all yes/no assertions */
undo :- retract(yes(_)),fail.
undo :- retract(no(_)),fail.
undo.
```

Output Screenshots-


SWI-Prolog (AMD64, Multi-threaded, version 8.4.2)
File Edit Settings Run Debug Help
Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.2)
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).
?-
% c:/Users/Admin/Documents/animal.pl compiled 0.00 sec, 29 clauses
?- go.
Does the animal have the following attribute: has_hair? yes.
Does the animal have the following attribute: eats_meat? |: yes.
Does the animal have the following attribute: has_tawny_color? |: no.
Does the animal have the following attribute: has_hooves? |: no.
Does the animal have the following attribute: chews_cud? |: yes.
Does the animal have the following attribute: has_long_neck? |: no.
Does the animal have the following attribute: has_black_stripes? |: yes.
I guess that the animal is: zebra
true.
?- go.
Does the animal have the following attribute: has_hair? yes
|:
|:
35°C Partly sunny
2:37 PM
4/1/2022


SWI-Prolog (AMD64, Multi-threaded, version 8.4.2)
File Edit Settings Run Debug Help
Does the animal have the following attribute: eats_meat? |: yes.
Does the animal have the following attribute: has_tawny_color? |: yes.
Does the animal have the following attribute: has_dark_spots? |: yes.
I guess that the animal is: cheetah
true.
?- go.
Does the animal have the following attribute: has_hair? no.
Does the animal have the following attribute: gives_milk? |: no.
Does the animal have the following attribute: has_feathers? |: yes.
Does the animal have the following attribute: does_not_fly? |: yes.
Does the animal have the following attribute: has_long_neck? |: yes.
I guess that the animal is: ostrich
true.
?- go.
Does the animal have the following attribute: has_hair? yes.
Does the animal have the following attribute: eats_meat? |: no.
Does the animal have the following attribute: has_pointed_teeth? |: yes.
Does the animal have the following attribute: has_claws? |: yes.
Does the animal have the following attribute: has_forward_eyes? |: yes.
Does the animal have the following attribute: has_tawny_color? |: no.
Does the animal have the following attribute: has_hooves? |: no.
Does the animal have the following attribute: chews_cud? |: no.
Does the animal have the following attribute: has_feathers? |: yes.
Does the animal have the following attribute: does_not_fly? |: no.
Does the animal have the following attribute: appears_in_story_Àncient_Mariner?yes.
Does the animal have the following attribute: flys_well? |: yes.
I guess that the animal is: albatross
true.
?-
35°C Partly sunny
2:43 PM
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?-
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Does the animal have the following attribute: has_hair? yes.
Does the animal have the following attribute: eats_meat? |: yes.
Does the animal have the following attribute: has_tawny_color? |: yes.
Does the animal have the following attribute: has_dark_spots? |: yes.
I guess that the animal is: cheetah
true.
?-
35°C Partly sunny
2:40 PM
4/1/2022