



Fundamentals of AI

CCAI-221




Animal identification System



to choose the appropriate animal

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Problem description:

People face a problem in determining the appropriate animal for ownership. Our system facilitates the decision-making process, as it asks the user several questions and determines from his answers the appropriate animal for him according to the purpose and animal specifications.



Solution description:

Our goal is to write an expert system that helps us identify animals. It has some facts and rules for determining the appropriate animal. The system asks the user several questions to determine the appropriate animal for him, such as (the age of the user, the purpose, the size of the animal, etc..) and then it will recommend to the user what animal is appropriate for him.



Theoretical background:

We searched in several sources to write facts and rules and to know the characteristics of animals and their classification and purpose as well. We also searched for their prices and classified their cost into (high, medium, low). These are the sources:

<https://sciencetrek.org/sciencetrek/topics/predators/facts.cfm>

<https://animals.howstuffworks.com/animal-facts/10-predators.htm>

<https://www.javatpoint.com/list-of-pet-animals>

https://www.cse.iitd.ac.in/~saroj/LFP/LFP_2013/L16.pdf



AI approach:

Specific AI approach used to solve the problem:

Thinking rationally: Logical rules and inference mechanisms that are provably correct and guarantee an optimal solution.

Acting rationally: our system focuses on acting sufficiently and achieving the best outcome.

An example: would be a person's wish: suppose the user enters the input and his persona's wish is an "A pet, adoption" Based on this system, he will recommend different animals knowing that they will fit his desire exactly.



Factor Table

GENRE	ANIMAL	AIM	FOR AGE	SIZE	CHARACTERISTICS	COST
Predator	Dog	Protection	Adult	Small/ large	Fur	Low/ medium/ high
Predator	Lion	Hunt	Adult	Large	Fur	Low/ medium/ high
Predator	Wolf	Hunt	Adult	Small	Fur	Low/ medium/ high
Predator	Hawk	Hunt	Adult	Small	Feathers	Low/ medium/ high
Predator	Fox	Hunt	Adult	Small	Fur	Low/ medium/ high
Predator	Bear	Hunt	Adult	Large	Fur	Low/ medium/ high
Pet	Dog	Adoption	Adult / teenager	Small/ large	Fur	Low/ medium/ high
Pet	Rabbit	Adoption	Adult / teenager	Small/ large	Fur	Low/ medium/ high
Pet	Turtle	Adoption	Adult / teenager	Small	Leather	Low/ medium/ high
Pet	Cat	Breeding	Adult / teenager	Small/ large	Fur	Low/ medium/ high
Pet	Bird	Adoption	Adult / teenager	Small	Feathers	Low/ medium/ high
Pet	Fish	Adoption	Adult / teenager	Small	Leather	Low/ medium/ high



Here is the full code:

```
suggest(S) :- write('Are you an adult or a teenager?: '),read(P),  
              write('What genre of animal do you prefer?: '),read(G),  
              write('What is the purpose?:'),read(A),  
              write('Do you prefer an animal with fur or feathers or  
leather?:'),read(F),  
              write('What is the size of animal do you prefer?:'),read(Z),  
              write('What is the right cost for you? (low, medium, high):'),read(E),  
              animal(S,G,A,P,F,Z,E).
```

%Predator animals

```
animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P=  
adult,(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
```

```
animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z =  
large,(E=(low);E=(medium);E=(high)),!.
```

```
animal(wolf,G,A,P,fur,Z,E):- G= predator, A = hunt ,P= adult ,Z =  
small,(E=(low);E=(medium);E=(high)),!.
```

```
animal(hawk,G,A,P,feathers,Z,E):- G= predator, A = hunt ,P= adult ,Z =  
small,(E=(low);E=(medium);E=(high)),!.
```

```
animal(fox,G,A,P,fur,Z,E):- G= predator, A = hunt ,P= adult ,Z =  
small,(E=(low);E=(medium);E=(high)),!.
```

```
animal(bear,G,A,P,fur,Z,E):- G= predator, A = hunt ,P= adult ,Z =  
large,(E=(low);E=(medium);E=(high)),!.
```

%Pet animals

```
animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ;  
P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
```

```
animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ;  
P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
```

`animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ;
P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.`

`animal(cat,G,A,P,fur,Z,E):- G= pet, A = breeding ,(P= (adult) ;
P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.`

`animal(bird,G,A,P,feathers,Z,E):- G= pet, A = adoption ,(P= (adult) ;
P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.`

`animal(fish,G,A,P,leather,Z,E):- G= pet, A = adoption ,(P= (adult) ;
P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.`

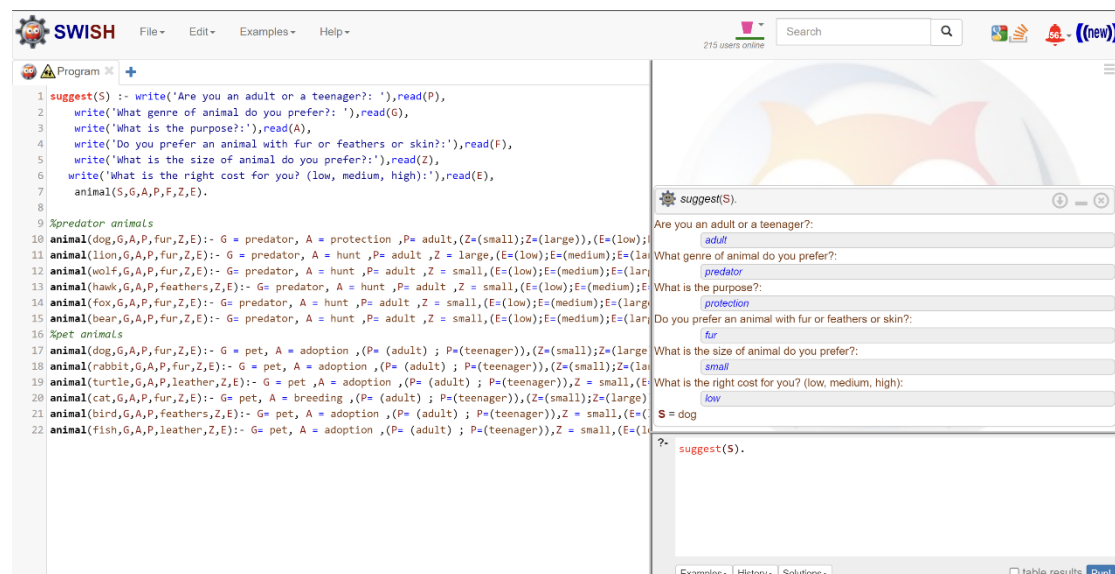
Code description:

The system asks the users several questions from the "suggest" rule. "Write" function is to display the question to the user and take the answer with the "read" function. Then, call the "animal" with all user answers. The system will search in the facts to decide and recommend the appropriate animal for the user.



The queries:

Query 1:



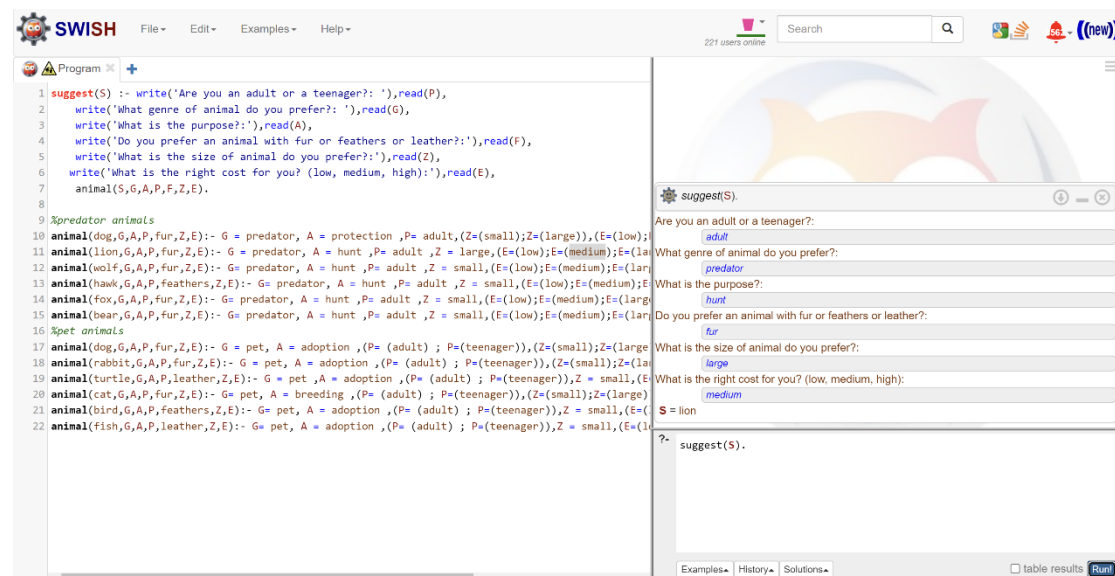
```
1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2               write('What genre of animal do you prefer?: '),read(G),
3               write('What is the purpose?: '),read(A),
4               write('Do you prefer an animal with fur or feathers or skin?: '),read(F),
5               write('What is the size of animal do you prefer?: '),read(Z),
6               write('What is the right cost for you? (low, medium, high): '),read(E),
7               animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult,(Z=(small);Z=(large)),(E=(low));
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(large));
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
16
17 %pet animals
18 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
19 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
20 animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large));
21 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
22 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large));
23 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large)).
```

Output of suggest(S):

Are you an adult or a teenager?:
adult
What genre of animal do you prefer?:
predator
What is the purpose?:
protection
Do you prefer an animal with fur or feathers or skin?:
fur
What is the size of animal do you prefer?:
small
What is the right cost for you? (low, medium, high):
low
S = dog

An adult wants wanting predator animal for protection with fur and size small, the cost is low, the system suggest dog.

Query 2:



```
1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2               write('What genre of animal do you prefer?: '),read(G),
3               write('What is the purpose?: '),read(A),
4               write('Do you prefer an animal with fur or feathers or leather?: '),read(F),
5               write('What is the size of animal do you prefer?: '),read(Z),
6               write('What is the right cost for you? (low, medium, high): '),read(E),
7               animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult,(Z=(small);Z=(large)),(E=(low));
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(large));
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
16
17 %pet animals
18 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
19 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
20 animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large));
21 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
22 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large));
23 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large)).
```

Output of suggest(S):

Are you an adult or a teenager?:
adult
What genre of animal do you prefer?:
predator
What is the purpose?:
hunt
Do you prefer an animal with fur or feathers or leather?:
fur
What is the size of animal do you prefer?:
large
What is the right cost for you? (low, medium, high):
medium
S = lion

An adult wants predator animal for hunt with fur and size large, the cost is medium, the system suggest lion.



Query 3:

The SWISH Prolog IDE interface displays a Prolog program with rules for animal classification and a query window showing the results of a query.

```

1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2   write('What genre of animal do you prefer?: '),read(G),
3   write('What is the purpose?: '),read(A),
4   write('Do you prefer an animal with fur or feathers or leather?: '),read(F),
5   write('What is the size of animal do you prefer?: '),read(Z),
6   write('What is the right cost for you? (low, medium, high): '),read(E),
7   animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult,(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(high)),!.
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high)),!.
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high)),!.
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high)),!.
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(high)),!.
16 %pet animals
17 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
18 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
19 animal(turtle,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.
20 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
21 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.
22 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.

```

The query window shows the results of the query `suggest(S).`:

```

Are you an adult or a teenager?:
teenager
What genre of animal do you prefer?:
pet
What is the purpose?:
adoption
Do you prefer an animal with fur or feathers or leather?:
leather
What is the size of animal do you prefer?:
small
What is the right cost for you? (low, medium, high):
high
S = turtle

```

A *teenager* wants pet animal for adoption with leather and size small, the cost is high, the system suggest turtle.

Query 4:

The SWISH Prolog IDE interface displays a Prolog program with rules for animal classification and a query window showing the results of a query.

```

1 ou an adult or a teenager?: '),read(P),
2 nimal do you prefer?: '),read(G),
3 pose?: '),read(A),
4 n animal with fur or feathers or leather?: '),read(F),
5 e of animal do you prefer?: '),read(Z),
6 t cost for you? (low, medium, high): '),read(E),
7
8
9
10 - G = predator, A = protection ,P= adult,(Z=(small);Z=(large)),(E=(low);E=(medium);E=(large)),!.
11 :- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(large)),!.
12 :- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large)),(E=(low);E=(medium);E=(high)),!.
13 ,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large)),!.
14 - G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large)),!.
15 :- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large)),!.
16
17 - G = pet, A = adoption ,(P= (adult) ; P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
18 E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
19 r,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large)),(E=(low);E=(medium);E=(high)),!.
20 - G = pet, A = breeding ,(P= (adult) ; P=(teenager)),(Z=(small);Z=(large)),(E=(low);E=(medium);E=(high)),!.
21 ,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large)),!.
22 Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(large)),!.

```

The query window shows the results of the query `animal(X,pet,adoption,adult,fur,large,low).`:

```

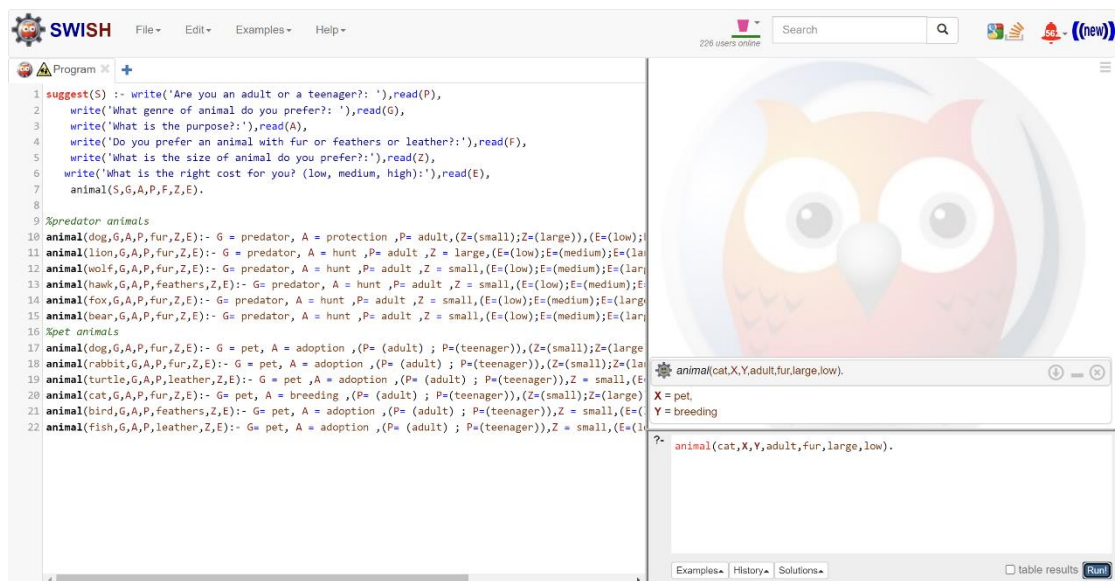
X = dog

```

Find the animal from some characteristics.



Query 5:



The SWISH Prolog IDE interface displays a Prolog program with the following code:

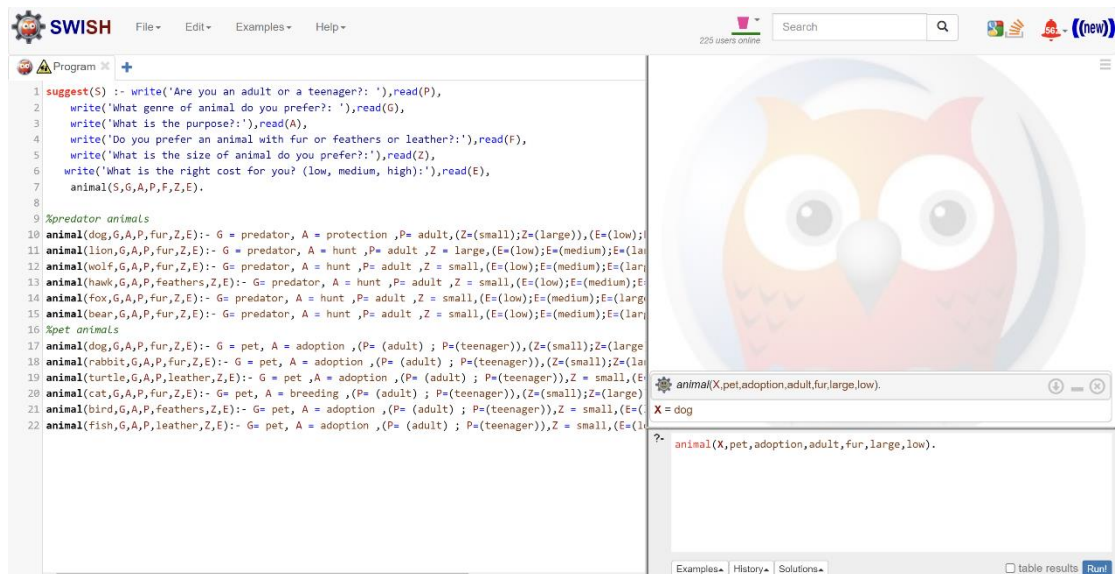
```
1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2   write('What genre of animal do you prefer?: '),read(G),
3   write('What is the purpose?: '),read(A),
4   write('Do you prefer an animal with fur or feathers or leather?: '),read(F),
5   write('What is the size of animal do you prefer?: '),read(Z),
6   write('What is the right cost for you? (low, medium, high): '),read(E),
7   animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult ,(Z=(small);Z=(large)),(E=(low));
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(large));
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(large));
16 %pet animals
17 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
18 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
19 animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ; P=(teenager)), Z = small,(E=(low));
20 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)), (Z=(small);Z=(large));
21 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), Z = small,(E=(low));
22 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)), Z = small,(E=(low)).
```

The execution results show the following bindings:

```
animal(cat,X,Y,adult,fur,large,low).
X = pet,
Y = breeding.
```

Find some characteristics of cat.

Query 6:



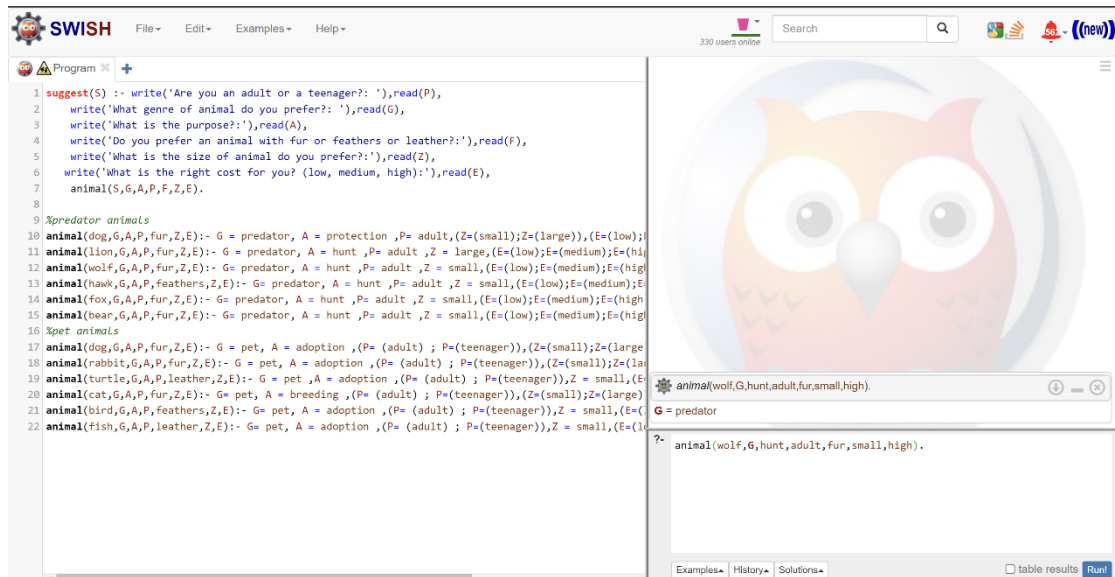
The SWISH Prolog IDE interface displays the same Prolog program as in Query 5. The execution results show the following bindings:

```
animal(X,pet,adoption,adult,fur,large,low).
X = dog.
```

Find the animal from some characteristics.



Query 7:



The SWISH interface displays a Prolog program with the following code:

```
1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2   write('What genre of animal do you prefer?: '),read(G),
3   write('What is the purpose?: '),read(A),
4   write('Do you prefer an animal with fur or feathers or leather?: '),read(F),
5   write('What is the size of animal do you prefer?: '),read(Z),
6   write('What is the right cost for you? (low, medium, high): '),read(E),
7   animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult,(Z=(small);Z=(large)),(E=(low);
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(high);
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high);
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high);
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high);
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high);
16
17 %pet animals
18 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
19 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
20 animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high);
21 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
22 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high);
23 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high);
```

The query window shows the following query:

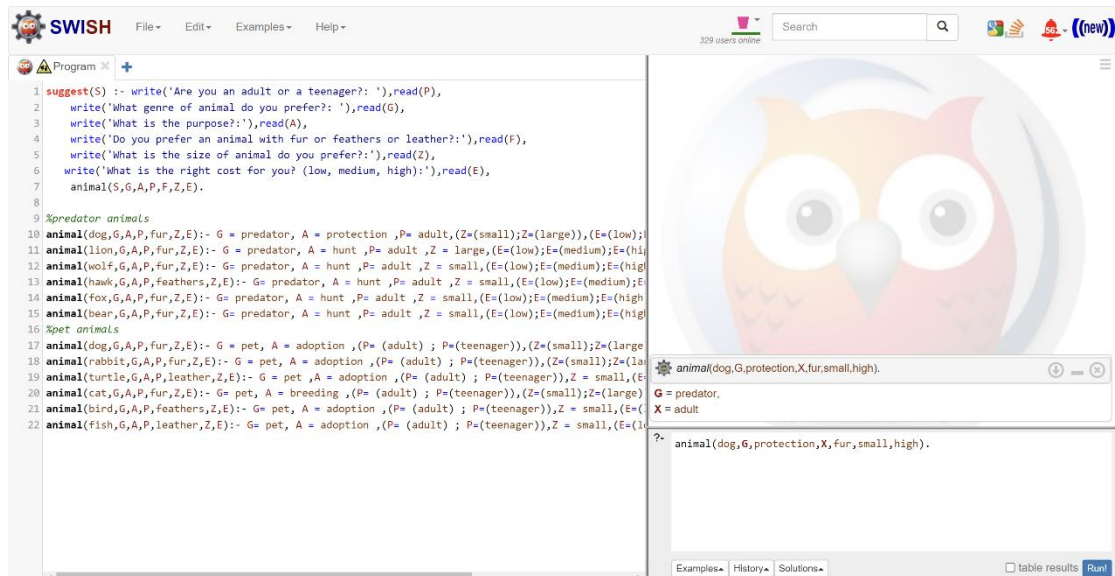
```
animal(wolf,G,hunt,adult,fur,small,high).
```

The results window shows the following result:

```
G = predator
```

Find some characteristics of wolf.

Query 8:



The SWISH interface displays the same Prolog program as in Query 7. The query window shows the following query:

```
animal(dog,G,protection,X,fur,small,high).
```

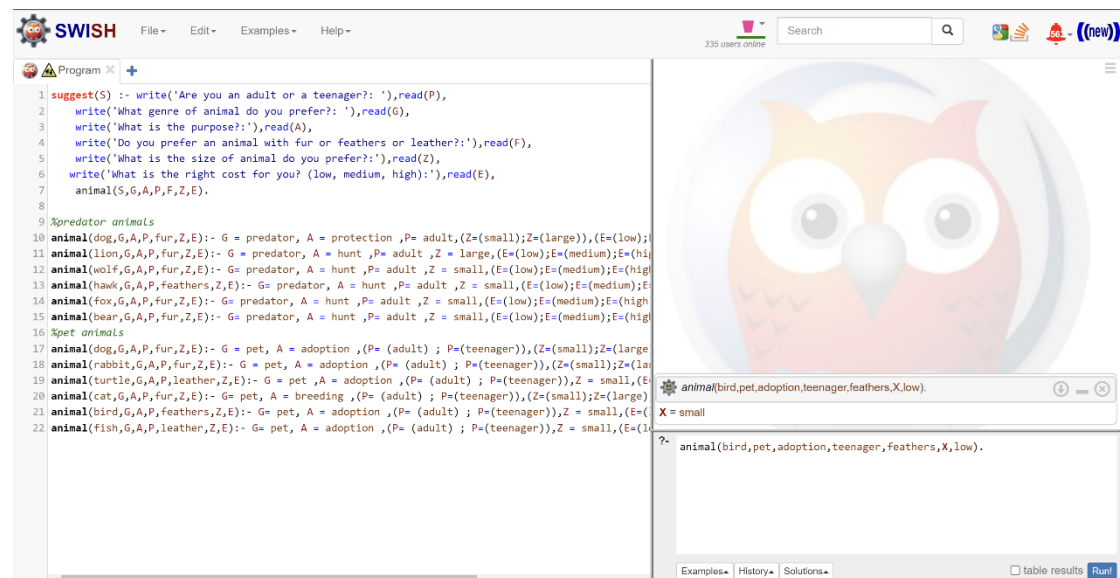
The results window shows the following result:

```
G = predator,
X = adult
```

Find some characteristics of dog.



Query 9:



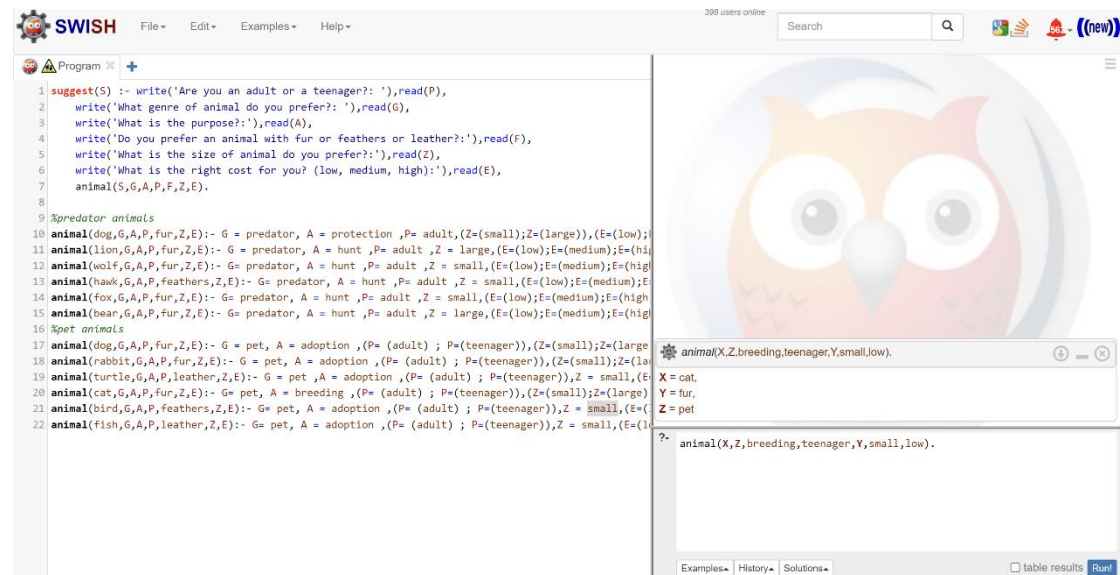
```
1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2               write('What genre of animal do you prefer?: '),read(G),
3               write('What is the purpose?: '),read(A),
4               write('Do you prefer an animal with fur or feathers or leather?: '),read(F),
5               write('What is the size of animal do you prefer?: '),read(Z),
6               write('What is the right cost for you? (low, medium, high): '),read(E),
7               animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult ,(Z=(small);Z=(large)),(E=(low));
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(high));
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
16
17 %pet animals
18 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
19 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
20 animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low));
21 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
22 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low));
23 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low));
```

animal(bird,pet,adoption,teenager,feathers,X,low).

X = small

Find some characteristics of bird.

Query 10:



```
1 suggest(S) :- write('Are you an adult or a teenager?: '),read(P),
2               write('What genre of animal do you prefer?: '),read(G),
3               write('What is the purpose?: '),read(A),
4               write('Do you prefer an animal with fur or feathers or leather?: '),read(F),
5               write('What is the size of animal do you prefer?: '),read(Z),
6               write('What is the right cost for you? (low, medium, high): '),read(E),
7               animal(S,G,A,P,F,Z,E).
8
9 %predator animals
10 animal(dog,G,A,P,fur,Z,E):- G = predator, A = protection ,P= adult ,(Z=(small);Z=(large)),(E=(low));
11 animal(lion,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(high));
12 animal(wolf,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
13 animal(hawk,G,A,P,feathers,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
14 animal(fox,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = small,(E=(low);E=(medium);E=(high));
15 animal(bear,G,A,P,fur,Z,E):- G = predator, A = hunt ,P= adult ,Z = large,(E=(low);E=(medium);E=(high));
16
17 %pet animals
18 animal(dog,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
19 animal(rabbit,G,A,P,fur,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
20 animal(turtle,G,A,P,leather,Z,E):- G = pet ,A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low));
21 animal(cat,G,A,P,fur,Z,E):- G = pet, A = breeding ,(P= (adult) ; P=(teenager)),Z=(small);Z=(large);
22 animal(bird,G,A,P,feathers,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low));
23 animal(fish,G,A,P,leather,Z,E):- G = pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low));
```

animal(X,Z,breeding,teenager,Y,small,low).

X = cat,
Y = fur,
Z = pet

Find the animal and some of his characteristics.

