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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 Al 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)),!.
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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)),!.

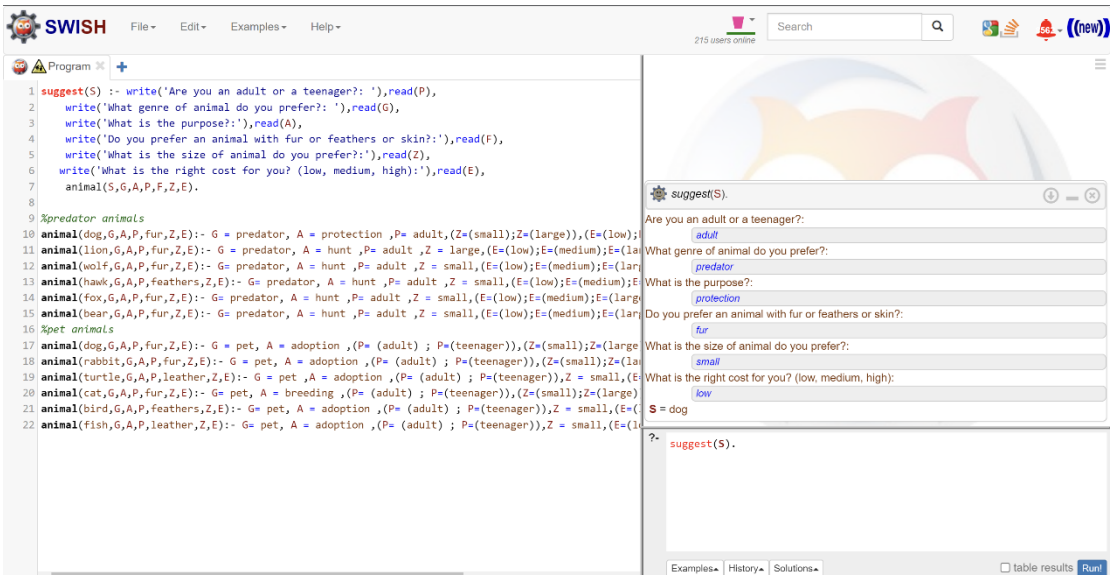
animal(fish,G,A,P,leather,Z,E):- G= pet, A = adoption ,(P= (adult) ; P=(teenager)),Z = small,(E=(low);E=(medium);E=(high)),!.

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.

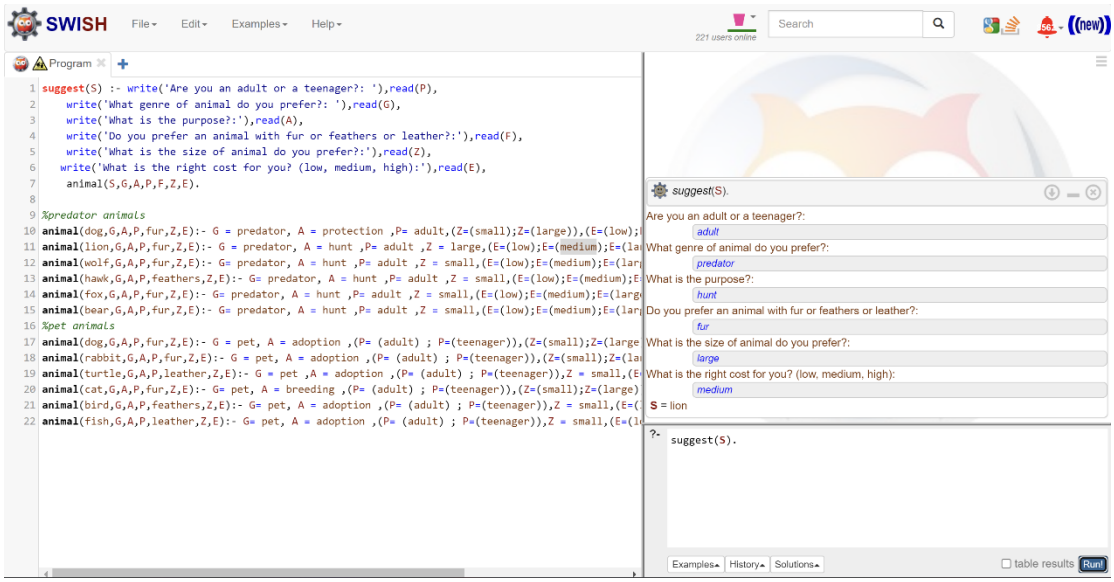
The queries:

Query 1:



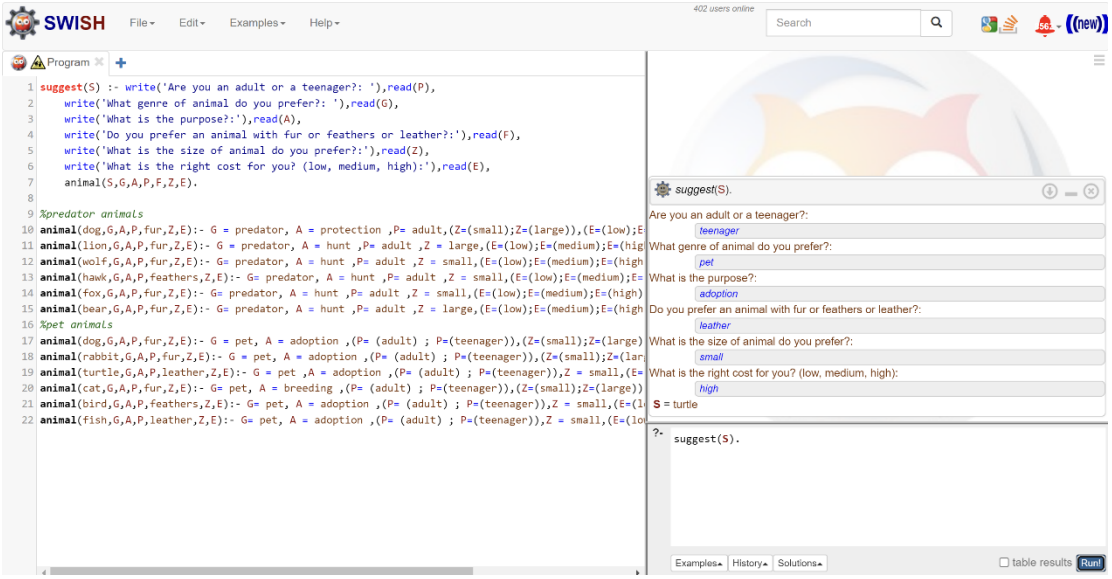
An adult wants wanting predator animal for protection with fur and size small, the cost is low, the system suggest dog.

Query 2:



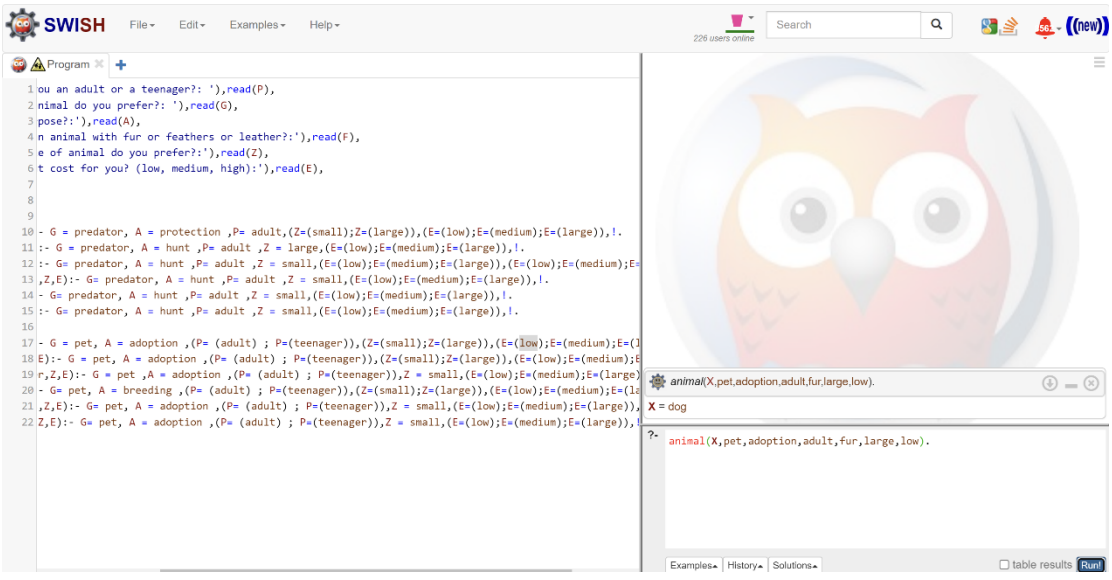
An adult wants predator animal for hunt with fur and size large, the cost is medium, the system suggest lion.

Query 3:



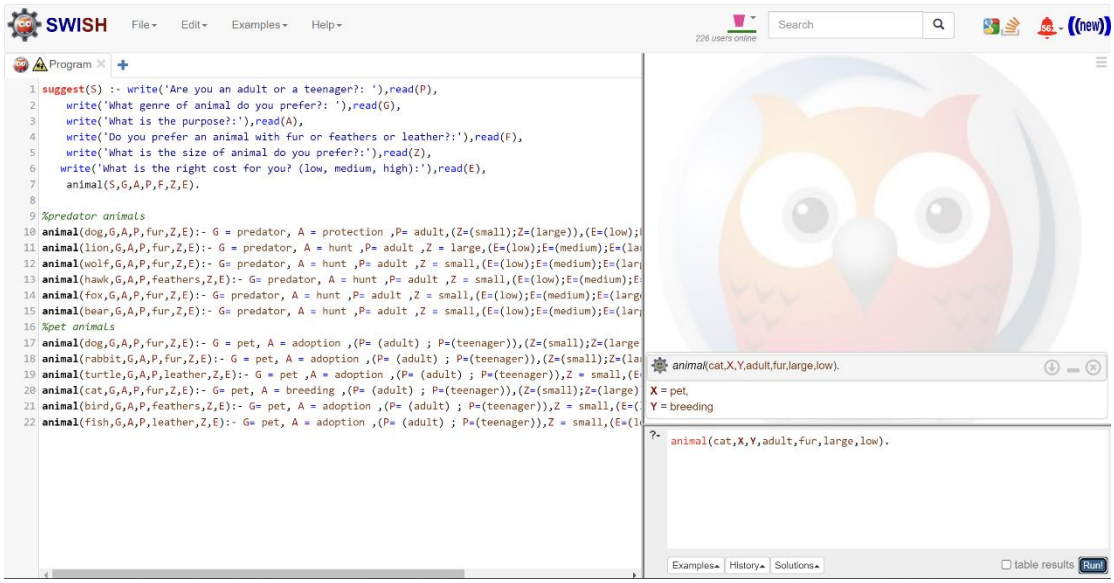
A teenager wants pet animal for adoption with leather and size small, the cost is high, the system suggest turtle.

Query 4:



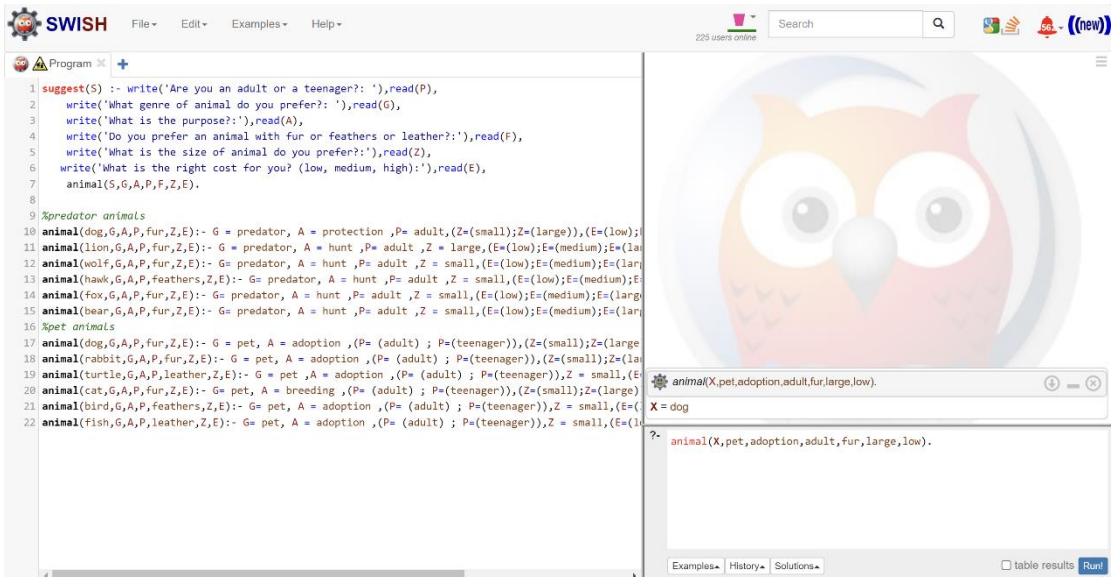
Find the animal from some characteristics.

Query 5:



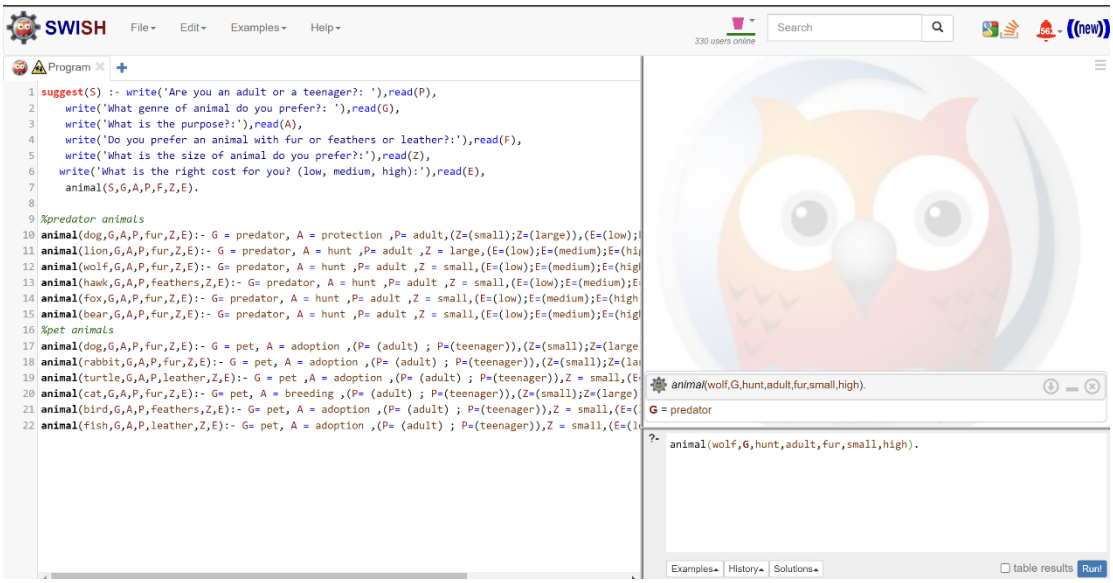
Find some characteristics of cat.

Query 6:



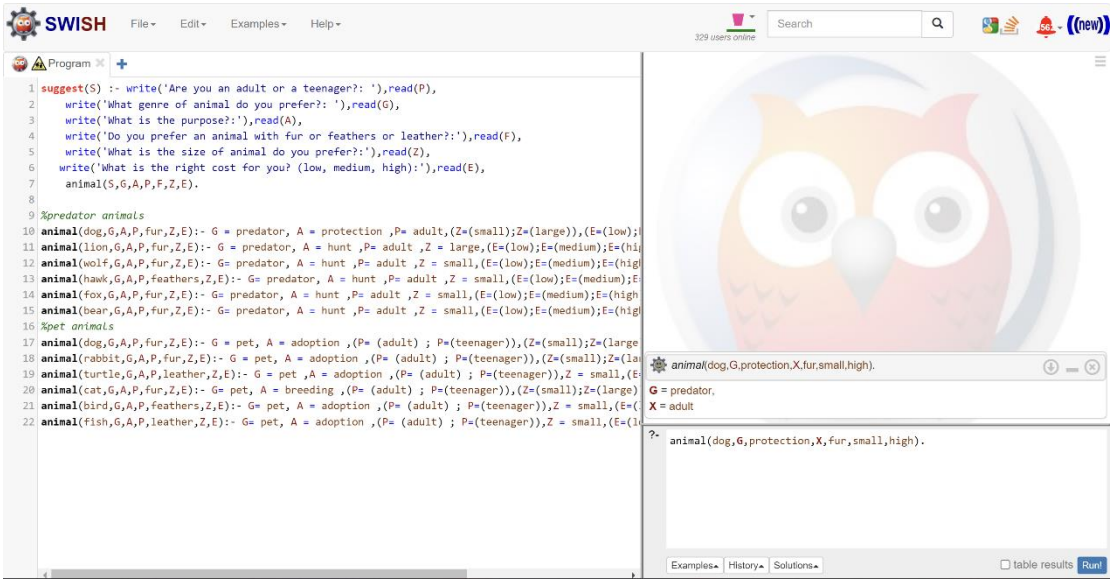
Find the animal from some characteristics.

Query 7:



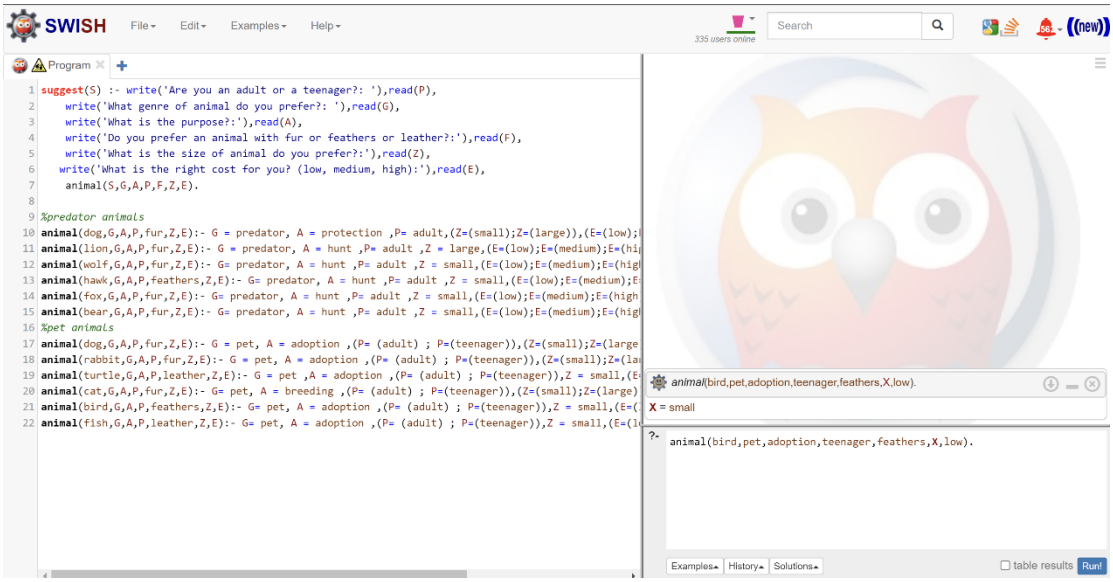
Find some characteristics of wolf.

Query 8:



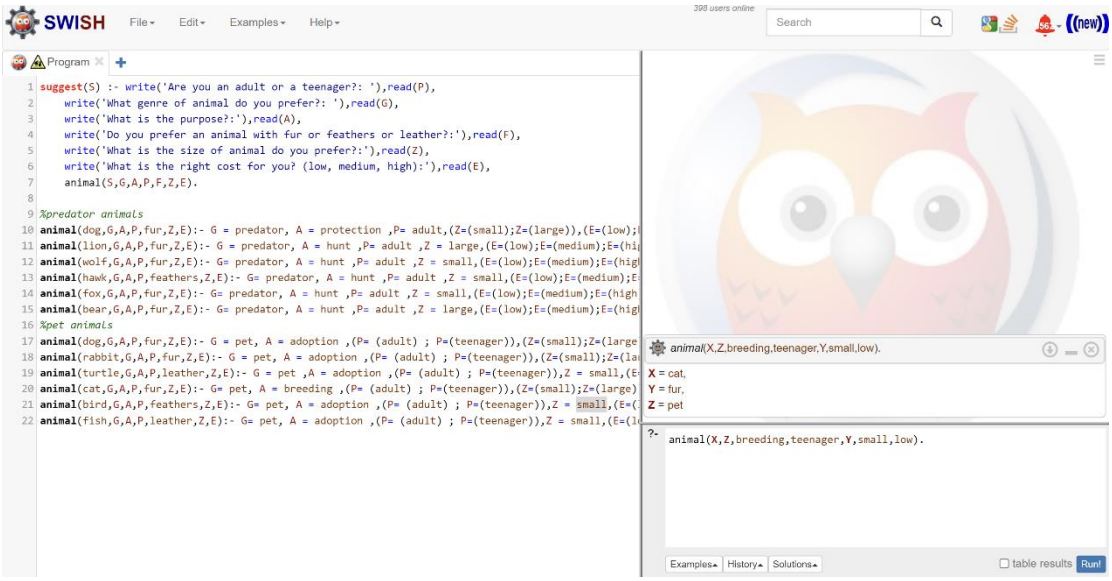
Find some characteristics of dog.

Query 9:



Find some characteristics of bird.

Query 10:



Find the animal and some of his characteristics.