

The Zebra problem

There are five houses, each of a different colour and inhabited by men of different nationalities, with different pets, drinks and cigarettes.

- 1. The Englishman lives in the red house.**
- 2. The Spaniard owns a dog.**
- 3. Coffee is drunk in the green house.**
- 4. The Ukrainian drinks tea.**
- 5. The green house is directly to the right of the ivory house.**
- 6. The Old-Gold smoker owns snails.**
- 7. Kools are being smoked in the yellow house.**
- 8. Milk is drunk in the middle house.**
- 9. The Norwegian lives in the first house on the left.**
- 10. The Chesterfield smoker lives next to the fox owner.**
- 11. Kools are smoked in the house next to the house where the horse is kept.**
- 12. The Lucky-Strike smoker drinks orange juice.**
- 13. The Japanese smokes Parliament.**
- 14. The Norwegian lives next to the blue house.**

Who drinks water and who owns the zebra?

Prolog Solution

```
/* -*- Mode: prolog -*-  
*/
```

```
nextto(X, Y, List) :- iright(X, Y, List).  
nextto(X, Y, List) :- iright(Y, X, List).  
iright(Left, Right, [Left, Right | _]).  
iright(Left, Right, [_ | Rest])  
    :- iright(Left, Right, Rest).
```

```
zebra(H, W, Z) :-  
    H = [house(norwegian, _, _, _, _),  
        _/  
        house(_, _, _, milk, _),  
        _/  
        _],  
    member(house(englishman, _, _, _, red), H),  
    member(house(spaniard, dog, _, _, _), H),  
    member(house(_, _, _, coffee, green), H),  
    member(house(ukrainian, _, _, tea, _), H),  
    iright(house(_, _, _, _, ivory),  
           house(_, _, _, _, green), H),  
    member(house(_, snails, winston, _, _), H),  
    member(house(_, _, kools, _, yellow), H),  
    nextto(house(_, _, chesterfield, _, _),  
          house(_, fox, _, _, _), H),  
    nextto(house(_, _, kools, _, _),  
          house(_, horse, _, _, _), H),  
    member(house(_, _, luckystrike, oj, _), H),  
    member(house(japanese, _, parliaments, _, _), H),  
    nextto(house(norwegian, _, _, _, _),  
          house(_, _, _, _, blue), H),  
    member(house(W, _, _, water, _), H),  
    member(house(Z, zebra, _, _, _), H).
```

```
/* This runs the query a single time:  
* ?- zebra(Houses, WaterDrinker, ZebraOwner).  
*/
```

Answer

swm-kayrun[349]: pl

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For help, use ?- help(Topic). or ?- apropos(Word).

1 ?- [zebra].

zebra compiled, 0.01 sec, 4,320 bytes.

Yes

2 ?- zebra(Houses, WaterDrinker, ZebraOwner).

Houses = [house(norwegian, fox, kools, water, yellow),
house(ukrainian, horse, chesterfield, tea, blue),
house(englishman, snails, winston, milk, red),
house(spaniard, dog, luckystrike, oj, ivory),
house(japanese, zebra, parliaments, coffee, green)]
WaterDrinker = norwegian
ZebraOwner = japanese ;

No

3 ?-