

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, [_ | Rest]).
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 ?-
```