AI(2180703)

Tutorial-6

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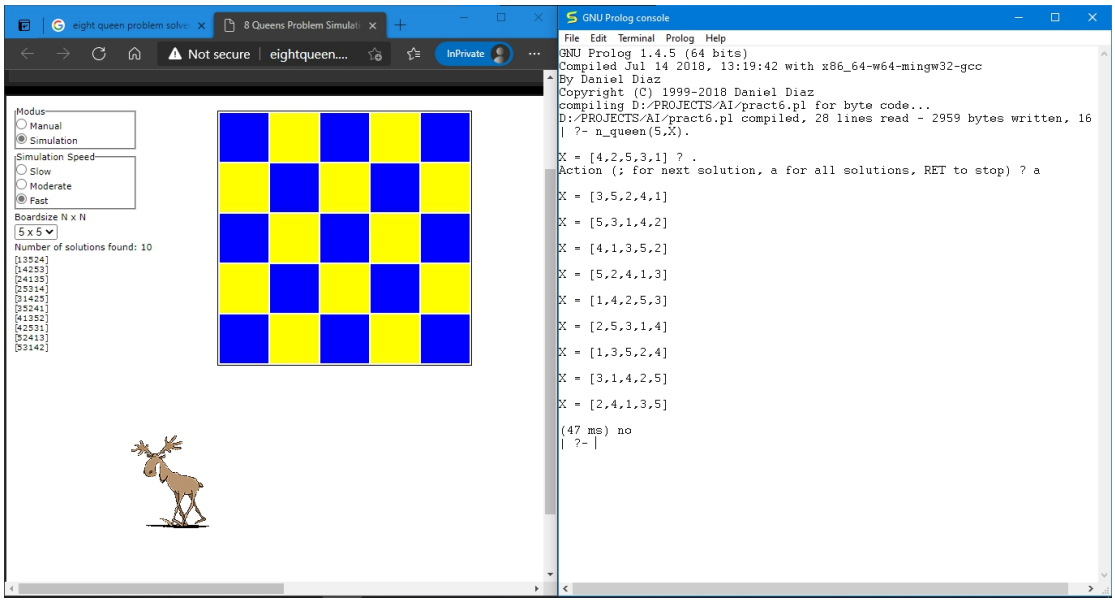
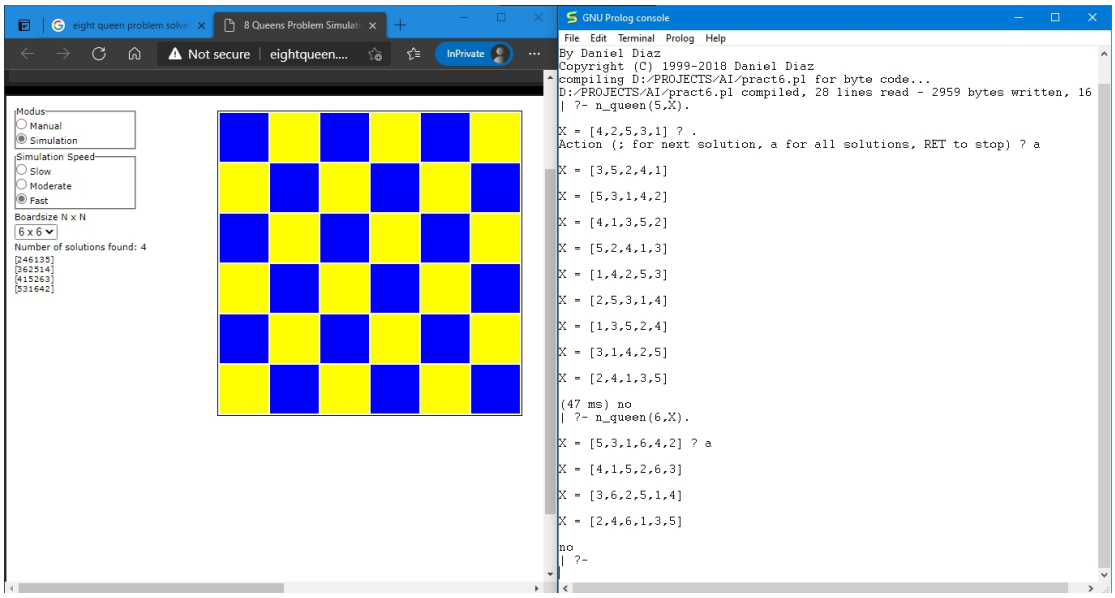
Q: Write a program to solve N-Queens problem using Prolog.

Code(pract6.pl):

```
use_module(library(lists)).

n_queen(N, Solution) :-

    length(Solution, N),
    queen(Solution, N).

up2N(N,N,[N]) :-!.
up2N(K,N,[K|Tail]) :- K < N, K1 is K+1, up2N(K1, N, Tail).

queen([],_).

queen([Q|Qlist],N) :-

    queen(Qlist, N),
    up2N(1,N,Candidate_positions_for_queenQ),
    member(Q, Candidate_positions_for_queenQ),
    check_solution(Q,Qlist, 1).

check_solution(_,[], _).

check_solution(Q,[Q1|Qlist],Xdist) :-
    Q =\= Q1,
    Test is abs(Q1-Q),
    Test =\= Xdist,
    Xdist1 is Xdist + 1,

check_solution(Q,Qlist,Xdist1).
```

Output :


8 Queens Problem Simulati
Not secure
eightqueen....
InPrivate
Modus
Manual
Simulation
Simulation Speed
Slow
Moderate
Fast
Boardsize N x N
5 x 5
Number of solutions found: 10
[13524]
[14253]
[24135]
[25314]
[31425]
[35241]
[41352]
[42531]
[52413]
[53142]
GNU Prolog console
File Edit Terminal Prolog Help
GNU Prolog 1.4.5 (64 bits)
Compiled Jul 14 2018, 13:19:42 with x86_64-w64-mingw32-gcc
By Daniel Diaz
Copyright (C) 1999-2018 Daniel Diaz
compiling D:/PROJECTS/AI/pract6.pl for byte code...
D:/PROJECTS/AI/pract6.pl compiled, 28 lines read - 2959 bytes written, 16
| ?- n_queen(5,X).
X = [4,2,5,3,1] ? .
Action (; for next solution, a for all solutions, RET to stop) ? a
X = [3,5,2,4,1]
X = [5,3,1,4,2]
X = [4,1,3,5,2]
X = [5,2,4,1,3]
X = [1,4,2,5,3]
X = [2,5,3,1,4]
X = [1,3,5,2,4]
X = [3,1,4,2,5]
X = [2,4,1,3,5]
(47 ms) no
| ?-


8 Queens Problem Simulati
Not secure
eightqueen....
InPrivate
Modus
Manual
Simulation
Simulation Speed
Slow
Moderate
Fast
Boardsize N x N
6 x 6
Number of solutions found: 4
[246135]
[362514]
[415263]
[531642]
GNU Prolog console
File Edit Terminal Prolog Help
By Daniel Diaz
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compiling D:/PROJECTS/AI/pract6.pl for byte code...
D:/PROJECTS/AI/pract6.pl compiled, 28 lines read - 2959 bytes written, 16
| ?- n_queen(5,X).
X = [4,2,5,3,1] ? .
Action (; for next solution, a for all solutions, RET to stop) ? a
X = [3,5,2,4,1]
X = [5,3,1,4,2]
X = [4,1,3,5,2]
X = [5,2,4,1,3]
X = [1,4,2,5,3]
X = [2,5,3,1,4]
X = [1,3,5,2,4]
X = [3,1,4,2,5]
X = [2,4,1,3,5]
(47 ms) no
| ?- n_queen(6,X).
X = [5,3,1,6,4,2] ? a
X = [4,1,5,2,6,3]
X = [3,6,2,5,1,4]
X = [2,4,6,1,3,5]
no
| ?-