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1 get_ele(T,[Row|Col],Ele):-nth(Row, T, Row_List),nth(Col, Row_List, Ele).
2
3 add_rule( _, [], 0).
4 add_rule(T, [Head|Tail], S):-get_ele(T,Head,Ele),add_rule(T,Tail,Sum),S #= Ele + Sum.
5
6 mul_rule( _, [], 1).
7 mul_rule(T, [Head|Tail], P):-get_ele(T,Head,Ele),mul_rule(T,Tail,Pro),P #= Ele * Pro.
8
9 sub_rule(T, J, K, D):-get_ele(T,J,Ele1), get_ele(T,K,Ele2),(D #= Ele1 - Ele2; D #= Ele2 - Ele1).
10
11 div_rule(T, J, K, Q):-get_ele(T,J,Ele1), get_ele(T,K,Ele2),(Q #= Ele1 / Ele2; Q #= Ele2 / Ele1).
12
13 check_rule(T,+(S, L)):-add_rule(T,L,S).
14 check_rule(T,*(P, L)):-mul_rule(T,L,P).
15 check_rule(T,-(D, J, K)):-sub_rule(T,J,K,D).
16 check_rule(T,/(Q, J, K)):-div_rule(T,J,K,Q).
17
18 check_row_len([], _).
19 check_row_len([Head|Tail], N):-length(Head, N),check_row_len(Tail, N).
20
21 check_len(T,N):-length(T,N),check_row_len(T,N).
22
23 check_uniq([]).
24 check_uniq([Head|Tail]):-fd_all_different(Head),check_uniq(Tail).
25
26 check_rules( _, []).
27 check_rules(T, [Head|Tail]):- check_rule(T, Head), check_rules(T ,Tail).
28
29 test_emp([[]]).
30 test_emp([[]|Tail]):- test_emp(Tail).
31
32 change_fir([], [], []).
33 change_fir([[Row_head|Row_tail]|Tail_rows], [Row_head|Trans_Hs], [Row_tail|Row]):- change_fir(Tail_rows, Trans_Hs, Row).
34
35 trans(T, []):- test_emp(T).
36 trans(T, [Trans_H|Trans_T]):- change_fir(T, Trans_H, Next_T), trans(Next_T, Trans_T).
37
38 check_domain(N, L) :- fd_domain(L, 1, N).
39
40 kenken(N,C,T):-
41     check_len(T,N),
42     check_uniq(T),
43     trans(T, Trans_T),
44     check_uniq(Trans_T),
45     maplist(check_domain(N), T),
46     check_rules(T, C),
47     maplist(fd_labeling, T).
48
49 make_test(0, []).
50 make_test(N, [N|Tail]):-N > 0, N_next is N - 1, make_test(N_next, Tail).
51
52 m_check(List, N):-make_test(N, Test_List), permutation(Test_List, List).
53
54 m_check_list([], 0, _).
55 m_check_list([Head|Tail], Nth, N):-Nth > 0, Next_N is Nth-1, m_check(Head,N),m_check_list(Tail, Next_N, N).
56
57
58 plain_kenken(N,C,T):- m_check_list(T, N, N), trans(T, Trans_T), m_check_list(Trans_T, N, N), check_rules(T, C).

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