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/*
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 *
 */

:- module(think, []).
/** <module> Main handler for responding to requests to think
 *
 */

:- use_module(library(http/http_dispatch)).
:- use_module(library(http/http_error)).
:- use_module(library(http/http_json)).
:- use_module(library(chr)).

:- http_handler(public(think), think, []).

:- chr_option(debug, on).

think(Request) :-
        http_read_json_dict(Request, Query),
        solve_and_reset(Query, Solution),
        reply_json_dict(Solution).

solve_and_reset(Query, Solution) :-
        solve(Query, Solution),
        nb_setval(solution, Solution),
        fail.
solve_and_reset(_, Solution) :-
        nb_getval(solution, Solution).

solve(Query, _{ actions: Solution,
                success: Success}) :-
        add_current_conditions(Query),
        with_output_to(string(S), chr_show_store(think)),
        debug(think, '~w', [S]),
        (   collect_action(Solution),
            Success  = true
        ;   Success = false
        ),
        !.

```

```
47  :- chr_constraint
48          temp/1,
49          vent/1,
50          soil/1,
51          heater/1,
52          too_hot/0,
53          too_cold/0,
54          temp_ok/0,
55          temp_in_range/0,
56          temp_out_range/0,
57          soil_is_dry/0,
58          soil_is_wet/0,
59          soil_ok/0,
60          vent_closed/0,
61          vent_open/0,
62          vent_in_motion/0,
63          heater_on/0,
64          heater_off/0,
65          todo_water/0,
66          cmd/2,
67          oops/0,
68          collect/1.
69
70  add_current_conditions(Query) :-
71          _{temp: Temp,
72            vent: Vent,
73            soil: Soil,
74            heater: Heat} :< Query,
75            todo_water,
76            temp(Temp),
77            vent(Vent),
78            soil(Soil),
79            heater(Heat).
80  collect_action(Solution) :-
81          collect(Solution).
82
83  temp(T) ==> T > 60, T =< 80 | temp_in_range.
84  temp(T) ==> T =< 60 | temp_out_range.
85  temp(T) ==> T > 80 | temp_out_range.
86  temp(T) <=> T > 80 | too_hot.
87  temp(T) <=> T < 40 | too_cold.
88  temp(_) <=> temp_ok.
89
90  vent(0) <=> vent_closed.
91  vent(255) <=> vent_open.
92  vent(_) <=> vent_in_motion.
93
```

```
94  soil(X) <=> X < 20 | soil_is_dry.
95  soil(X) <=> X > 80 | soil_is_wet.
96  soil(_) <=> soil_ok.
97
98  heater(1) <=> heater_on.
99  heater(0) <=> heater_off.
100
101 too_hot \ heater_on  <=> cmd(heater, off).
102 too_cold \ heater_off  <=> cmd(heater, on).
103
104 too_hot \ vent_closed <=> cmd(vent, open).
105 too_cold \ vent_open <=> cmd(vent, close).
106
107 temp_ok, soil_is_wet, vent_closed <=> cmd(vent, open).
108 temp_ok, soil_is_dry, vent_open <=> cmd(vent, close).
109
110 temp_ok, soil_is_dry \ heater_on <=> cmd(heater, off).
111
112 soil_is_wet \ todo_water <=> cmd(water, off).
113 soil_is_dry \ todo_water <=> cmd(water, on).
114 soil_ok, temp_in_range \ todo_water <=> cmd(water, on).
115 soil_ok, temp_out_range \ todo_water <=> cmd(water, off).
116
117 cmd(heater, off), cmd(heater, on) <=> oops.
118 cmd(vent, open), cmd(vent, close) <=> oops.
119
120 cmd(X, Y), cmd(X, Y) <=> cmd(X, Y).
121
122 collect(_), oops <=> fail.
123 collect(L), cmd(Unit, Value) <=> format(atom(A), '~w:~w', [Unit, Value]), L
124 collect(X) <=> X = [], true.
```