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function russell_demo()

% Do the example in ch 17 (p501) of Russell and Norvig
% (1,1) is top left corner.

r = 3; c = 4; p = 0.8; action_cost = -1/25;
obstacle = zeros(r,c); obstacle(2,2)=1;
terminal = zeros(r,c); terminal(1,4)=1; terminal(2,4)=1;
absorb = 1;
wrap_around = 0;
noop = 0;
T = mk_grid_world(r, c, p, obstacle, terminal, absorb, wrap_around, noop);
% Add rewards for terminal states
nstates = r*c + 1;
if noop
    nact = 5;
else
    nact = 4;
end
R = action_cost*ones(nstates, nact);
R(10,:) = 1;
R(11,:) = -1;
R(nstates,:) = 0;
discount_factor = 1;

V = value_iteration(T, R, discount_factor);
%reshape(V(1:end-1),[r c])
%   0.8116   0.8678   0.9178   1.0000
%   0.7616   0.7964   0.6603  -1.0000
%   0.7053   0.6553   0.6114   0.3878
% Same as the book p501

Q = Q_from_V(V, T, R, discount_factor);
[V, p] = max(Q, [], 2);

use_val_iter = 1;
% (I-gT) is singular since g=1 and there is an absorbing state (i.e., T(i,i)=1)
% Hence we cannot use value determination.
[p,V] = policy_iteration(T, R, discount_factor, use_val_iter);

%reshape(V(1:end-1),[r c])
%   0.8115   0.8678   0.9178   1.0000
%   0.7615   0.7964   0.6603  -1.0000
%   0.7048   0.6539   0.6085   0.3824

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