

```
function [rewseen,stateseen] = rw_episode(n_rw_states)
% RW_EPISODE - simulate the states and rewards for a random walk
%
% n_rw_states: the number of non-terminal states
%
% Note: in the inner loop the terminal states are
% "0" for the left end and
% "n_rw_states+1" for the right end,
%
% we then add one to put the return states in the range [1,n_rw_states+2].
%
% Written by:
% --
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% Please send comments and especially bug reports to the
% above email address.
%
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% start in the middle state:
st = round(0.5*(n_rw_states+1)); stateseen = [st]; rewseen = [];

while( (0 < st) && (st < (n_rw_states+1)) )
    % go left half of the time; right half of the time:
    if( rand<0.5 )
        stp1=st+1;
    else
        stp1=st-1;
    end

    % assign a reward for this step ... do the most common case first:
    if( (stp1~=0) && (stp1~=(n_rw_states+1)) )
        rew = 0;
    else
        if( stp1==0 )
            rew = -1;
            %rew = 0;
        else
            rew = +1;
        end
    end

    % save everything:
    rewseen = [rewseen, rew];
    stateseen = [stateseen, stp1];
    st = stp1;
end

% return "one" based states:
stateseen=stateseen+1;
```