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%{
   a script for comparison of
   - a vectorized approach to programming, to
   - loops over elements of a vector
%}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% the problem: how many nonzero elements there are in a given vector?
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

  %%% input data: a random vector of N numbers 0-10
N=100000
v=round(10*rand(1,N));

  %%% a vectorized approach:
tic();    % start measuring time
r = sum((v~=0));
disp(['the number of nonzeros: ' num2str(r)]);
toc();    % stop measuring time and print the time interval

  %%% loop over elements of vector
tic();    % start measuring time
r=0;
for k=1:length(v)
  if v(k)~=0
    r = r+1;
  end
end
disp(['the number of nonzeros: ' num2str(r)]);
toc();    % stop measuring time and print the time interval
```