```
% lab2.m
% Please place lab2.m in your working directory
% Provide the print-out from running this function
% using 'publish lab2'
%
% T. Holton 10 Sept 21

clear
test_lab2;
```

Real-time Convolution

Real-time convolution #1

```
x = [1 4 2 6 5];
h = [4 -1 3 -5 2];
test_lab2;
test_lab2(x, h);

% Real-time convolution convolution #2
test_lab2(h, x);

% Real-time convolution #3
x = cos(2 * pi * (1:50000) / 16); % nice, big sequence
h = ones(1, 10);
test_lab2(x, h);
```

```
Real-time convolution #1
   Your data are correct

Real-time convolution #2
   Your data are correct

Real-time convolution #3
   Your data are correct
```

Code

```
disp('-----------------------------------------------------')
disp('                     Code')
disp('-----------------------------------------------------')
type convolv_rt
```

```
-----------------------------------------------------
                     Code
-----------------------------------------------------

function y = conv_rt(x, h)
 lh = length(h);
 hbuf = h(:)'; % make h a row vector
```

```
 x = [x(:); zeros(lh-1, 1)]; % pad x with zeros
 y = zeros(1, length(x)); % preallocate output array
 xbuf = zeros(lh, 1); % initialize input array as column vector
for i = 1:length(x) % for each new value of x[n]
  % put x(i) into the correct place in xbuf
  xbuf = [x(i); xbuf];
  xbuf(end) = [];
  % set up the indexing into the hbuf and/or xbuf arrays here
  y(i) = hbuf * xbuf; % store output value

 end
end
```

Published with MATLAB® R2022b