

Topics: Characters and strings

Reading (ML): Sec 6.2 (exclude 6.2.5, 6.2.8, and example 6.2)

String creation and manipulation

```
str = 'Age 19'           % a 1-d array of characters
code = double(str)       % convert chars to ASCII values
str1 = char(code)        % convert ASCII values to chars

% 2-d array of characters
block = ['one row'; 'two rows'] % Error! Rows must have same length
block = ['one row '; 'two rows']
blk = char('one row', 'two rows')
line1 = blk(1,:)         % length 8
line1trim = deblank(blk(1,:)) % length 7, trailing blank removed

% string functions
str = 'Age 19'
ischar(str)             % is the variable a char array? Return ONE value
isletter(str)
isspace(str)
caps = upper(str)
small = lower(str)

% char arithmetic, relation
base = 'a'
nextcode = base + 1
nextletter = char(nextcode)
letter18 = char(base+18-1)
ans1 = 'a' > 'b'
ans2 = base=='a'
ans3 = base==letter18
blk = char('one row', 'two rows')
ans4 = blk=='o'          % character-by-character comparison
ans5 = blk(1,:)==blk(2,:) % character-by-character comparison
```

Read textbook to see other useful functions!

Example 1

Write a function **caps** that capitalizes the first letter in each word of a string. Function **caps** accepts as input argument one string and returns two variables: the partially capitalized string and the number of capital letters in that string. Assume the string contains letters and spaces only.

Example 2

Given a string **str**, write a program segment to count how many times the alphabet **o** appears in **str**.

Example 1 solution

```
function [str, nCaps] = caps(str)
% Capitalize 1st letter in each word of input string
% str    <-- partially capitalized string
% nCaps  <-- number of capitalized letters

str(1) = upper(str(1));
nCaps = 1;                % number of caps so far
for i=2:length(str)
    if (str(i-1)==' ')
        str(i) = upper(str(i));
        nCaps = nCaps + 1;
    end
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% example usage %%%%
% >> [str,n] = caps('here is a test')
```

Thought question: how does the code change if there could be multiple spaces between words?

Example 2 solution

```
target = 'o';

% Number of occurrences of target
n0 = sum(str==target)

% Alternate solution
n0 = 0; % count target so far
for i=1:length(str)
    n0 = n0 + (str(i)==target)
end
```