

ES 314 Advanced Programming, Simulation and Modeling

Fall 2012

Home Work # 3 solutions

- 1) Word count problem: Here letter is interpreted as any character in the file, except the end of line characters and end of file character.

(modified version of code by Fabian)

```
function [lines,words,letters]=wc(filename)

% Read in the file one line at a time
linesInFile=textread(filename,'%s','delimiter','\n');

% lines variable is set as the number of lines in the file
% including lines that don't contain text.
lines=length(linesInFile);

% numLines is set to have the same value as
% lines for use in for-loop

numLines=lines;

% for loop removes blank lines from the total number of lines
for i=1:numLines
    if(length(linesInFile{i})==0)
        lines=lines-1;
    end
end

% Read in the file one word at a time
wordsInFile=textread(filename,'%s','delimiter','\n ,.?!');

% words variable is set as the number of times the delimiters \n,
% whitespace, comma, period, question mark, and exclamation point
% are encountered while reading in the file.
words=length(wordsInFile);

% numWords is set to have the same value as words for use in for-loop
numWords=words;

% for loop removes occurrences of delimiters that do not separate
% words from total number of words.
for i=1:numWords
    if(length(wordsInFile{i})==0)
        words=words-1;
    end
end
```

```
end
```

```
letters=0; % initializing the number of letters in the file to zero
% count the number of alpha characters in the file.
for i=1:numLines
    letters=letters+length(linesInFile{i});
end
end
```

2) Exercise 7.11

```
function res = month2num(name)
month1 = {'January', 'February', 'March', 'April', ...
'May', 'June', 'July', 'August', ...
'September', 'October', 'November', 'December'};
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month2 = {'Jan', 'Feb', 'Mar', 'Apr', 'May', ...
'Jun', 'Jul', 'Aug', 'Sep', 'Oct', ...
'Nov', 'Dec'};
c = strcmpi(name, month1);
if ~any(c) %If the name is of the abbreviation form
c = strcmpi(name, month2);
if ~any(c) %Even the abbreviation form has no match
error('Not a name of a month');
return;
end
end
    res = find(c = 1);
```

- 3)) In this problem, we will represent an arbitrarily large positive integer as a vector by breaking down the number into groups of 5 digits with the last five digits stored in position 1 of the array. For example, the number 1287 08765 94512 will be stored as the vector [94512, 8765, 1287]. You are to write a function multbyk that takes as input a vector v representing a positive integer x with unlimited number of digits and a 5 digit positive integer k , and returns a string that represents k times x . An example of input/output is:

Note: The example had 15 digits. This does not mean that your program is limited to inputs having 15 digits. As the problem makes it clear, the length of the vector vec can be arbitrarily long.

Solution:

```
function s = mult(vec,x)
carry = 0; s = '';
for j = length(vec):-1:1
    tmp = (vec(j)*x + carry);
```

```
    res = mod(tmp, 100000);  
    carry = floor(tmp/100000);  
    s = strcat(pad(res),s);  
end;  
s = strcat(pad(carry),s);
```

```
function st = pad(x)  
    st = num2str(x);  
    if x > 9999  
        return;  
    elseif x > 999  
        ad = '0';  
    elseif x > 99  
        ad = '00';  
    elseif x > 9  
        ad = '000';  
    else  
        ad = '0000';  
    end;  
    st = strcat(ad, st);
```