CS100 – Fall 2015

Homework #3

Due: December 18th, 2015, 23:55

In this homework you will write a menu driven Octave program by which the user can do some text operations by making use of functions that you will write. Your main program should get a text string (which may consist of multiple sentences) from the user.

Structure of the given text: Each sentence ends with a period (.). There is only one space after each sentence and no space at the beginning or at the end of the text. The words in a sentence are separated with one space. The only punctuation to be used in the given text is periods (.) and commas (,).

You are **not** allowed to use strrep, findstr and strfind functions of Octave. You should be creating and using your own functions as follows:

- findChar: receives a text string an letter from the calling program. Finds all occurrences of the given letter in the given string and returns their positions in an array.

Examples:

```
findChar('O pikap, su pikap, bu pikap.','p') → 3    7   13   17   23   27
findChar('O pikap, su pikap, bu pikap.',',') → 8    18
findChar('O pikap, su pikap, bu pikap.',' ') → 2    9    12    19    22
```

- replaceChar: Receives a text string and two letters from the calling program. Replaces all occurrences of the first letter in the given string with the second one in a case insensitive manner. Returns the resulting new string.

Examples:

```
replaceChar('O pikap, su pikap, bu pikap.','p','b')  → O bikab, su bikab, bu bikab.
replaceChar('Kirk kirik kup kirkinin da kulpu kirik kara kup.','k','g') → girg
girig gup girginin da gulpu girig gara gup.
```

- replaceWord: Receives a text string and two words (string again) from the calling program. Replaces all occurrences of the first word in the given string with the second one in a case insensitive manner and affecting only on whole words. Returns the resulting new string.

Example:

```
replaceWord('Bu kose yaz kosesi, su kose kis kosesi.','kose','taraf') → Bu taraf
yaz kosesi, su taraf kis kosesi.
```

- countWords: receives a text string and a word (string) from the calling program. Counts the number of occurrences of the word in the given string. Works in a case insensitive manner and operates only on whole words.

Example

```
countWords(' Bir berber bir berbere, bre berber gel beraber bir berber dukkani
acalim demis.','Berber') → 3
```

- wordFrequency: Receives a string and counts the number of occurrences of each word in the given text. Result is provided as a cell array where the first column stores the words as **sorted** and the column stores their occurrences.

Example:

```
wordFrequency('A be kuru dayi ne kuru sari dari bu dari a be kuru dayi.') →
{
  [1,1] = a
  [2,1] = be
  [3,1] = bu
  [4,1] = dari
  [5,1] = dayi
  [6,1] = kuru
  [7,1] = ne
  [8,1] = sari
  [1,2] =  2
  [2,2] =  2
  [3,2] =  1
  [4,2] =  2
  [5,2] =  2
  [6,2] =  3
  [7,2] =  1
  [8,2] =  1
}
```

- makeStat: Receives a text string where the sentences are separated with a period. Returns the number of words and number of letters for each sentence. The result is a cell array where the first column is the sentence, the second column is the number of words and the third column is the number of letters.

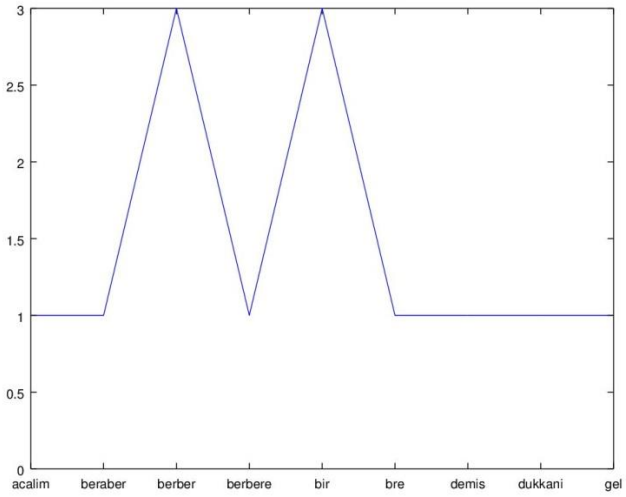
Example:

```
makeStat('Every Saturday Daniel and his family go to the beach. His parents love
the beach. Daniel and his sister and brother love the beach. Their dog loves the
beach very much. But it is a problem to go to the beach every week.') →
{
  [1,1] = Every Saturday Daniel and his family go to the beach.
  [2,1] = His parents love the beach.
  [3,1] = Daniel and his sister and brother love the beach.
  [4,1] = Their dog loves the beach very much.
  [5,1] = But it is a problem to go to the beach every week.
  [1,2] =  10
  [2,2] =  5
  [3,2] =  9
  [4,2] =  7
  [5,2] =  12
  [1,3] =  43
  [2,3] =  22
  [3,3] =  40
  [4,3] =  29
  [5,3] =  38
}
```

- plotWF: Plots the word frequency.

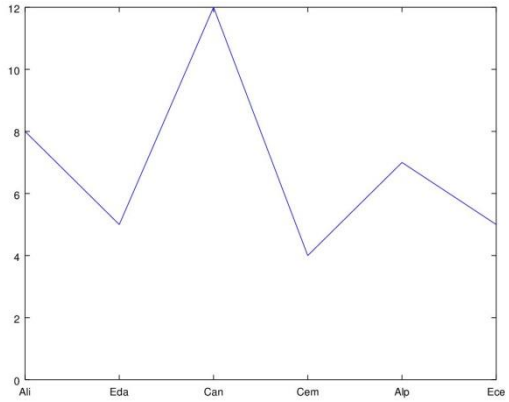
Example:

```
plotWF('Bir berber bir berbere, bre berber gel beraber bir berber dukkani acalim
demis.') →
```



Hint: A sample code to plot a string array versus numerical values is given below. On the right hand side, you can see its output figure.

```
A = {'Ali', 'Eda', 'Can', 'Cem', 'Alp','Ece'};
B = [8 5 12 4 7 5];
plot(1:length(B), B);
set(gca, 'XTick', 1:length(B))
set(gca, 'XTickLabel', A)
axis([1 length(B) 0 max(B)])
```



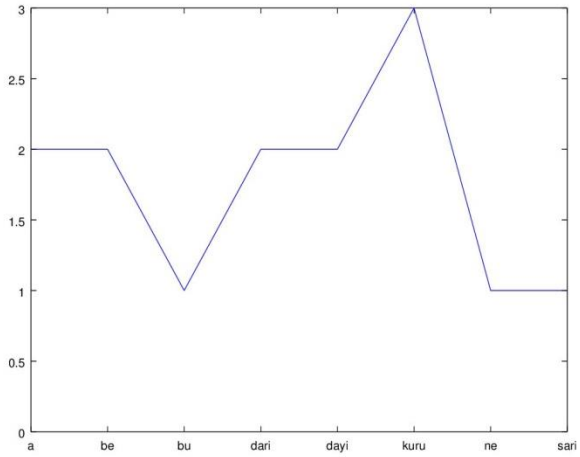
A sample run is as follows. The menu list and their behavior are self explanatory. Note that the outputs of makeStat and wordFrequency functions are formatted and therefore is printed as an array.

```
hw3
Enter text: Every Saturday Daniel and his family go to the beach. His parents love
the beach. Daniel and his sister and brother love the beach. Their dog loves the
beach very much. But it is a problem to go to the beach every week.

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: stat
Sentence        Word Count      Letter Count
Every Saturday Daniel and his family go to the beach.   10              43
His parents love the beach.     5               22
Daniel and his sister and brother love the beach.       9               40
Their dog loves the beach very much.    7               29
But it is a problem to go to the beach every week.      12              38

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
```

```
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: fc
Enter character to be searched for: w
This letter is at positions: 215

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit


 Enter your choice: fc
Enter character to be searched for: y
This letter is at positions:     5    14    36   162   213

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: rw
Enter word to be searched for: Daniel
Enter word to replace it with: Ali
str = Every Saturday Ali and his family go to the beach. His parents love the
 beach. Ali and his sister and brother love the beach. Their dog loves the be
ach very much. But it is a problem to go to the beach every week.

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: rc
Enter character to be searched for: y
Enter character to replace it with: x
str = Everx Saturdax Ali and his familx go to the beach. His parents love the
 beach. Ali and his sister and brother love the beach. Their dog loves the be
ach verx much. But it is a problem to go to the beach everx week.

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: cw
Enter word to be counted: beach
beach takes place 5 times in the text.

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: wf
Word            Word Count
a               1
ali             2
and             3
beach           5
brother         1
```

```
but             1
dog             1
everx           2
familx          1
go              2
his             3
is              1
it              1
love            2
loves           1
much            1
parents         1
problem         1
saturdax                1
sister          1
the             5
their           1
to              3
verx            1
week            1

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: nt
Enter a new text: A be kuru dayi ne kuru sari dari bu dari a be kuru dayi.

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: stat
Sentence        Word Count      Letter Count
A be kuru dayi ne kuru sari dari bu dari a be kuru dayi.    14    42

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: wf
Word            Word Count
a               2
be              2
bu              1
dari            2
dayi            2
kuru            3
ne              1
sari            1

STAT:   Show Statistics         FC:     Find Character
RW:     Replace Word            RC:     Replace Character
CW:     Count Word              WF:     Word Frequency
PLOT:   Plot Word Freq.         NT:     New Text
Q:      Quit

 Enter your choice: rw
Enter word to be searched for: dayi
Enter word to replace it with: amca
str = A be kuru amca ne kuru sari dari bu dari a be kuru amca.
```

```
STAT:    Show Statistics          FC:      Find Character
RW:      Replace Word             RC:      Replace Character
CW:      Count Word               WF:      Word Frequency
PLOT:    Plot Word Freq.          NT:      New Text
Q:       Quit

Enter your choice: plot
```




```
 Enter your choice: q
BYE
```

Note:

- When submitting, submit eight files (seven files as referred and named above and one hw3.m file that manages the program).
- No other methods accepted. You may resubmit as many times as you want until the deadline.
- Write your name, id and department name at the top line of each submited file in a commented manner. Ex: % Özgür Yurtsever, S011919, Industrial Eng.
- WARNING: This homework is an individual assignment. Your programs are checked and compared against each other using automated tools. Any act of cheating will be punished. DO NOT GIVE/TAKE YOUR HOMEWORK TO/FROM OTHERS.