Text formatting

Submission deadline:	**2011-11-27 23:59:59**	461982.259 sec
Evaluation:	**0.0000**	
Max. assessment:	**3.0000** (Without bonus points)	
Submissions:	0 / 10 Free retries + 20 Penalized retries (-2 % penalty each retry)	
Advices:	0 / 2 Advices for free + 2 Advices with a penalty (-10 % penalty each advice)	

The task is to implement text processing function that formats input text to fit given width.

The required interface is:

```
char * wordWrap ( char * src, int width );
```

src
> is an ASCIIZ (binary zero terminated) string to be formatted. The function is allowed to read the text (modifications are forbidden),

width
> is the maximum line width in characters,

return value
> is the input text formatted such that lines of the text are as long as possible, but the maximal width is not exceeded. The text is left justified. The function allocates the output string dynamically, using `malloc()` function (do not use C++ operator `new`). The caller processes the output string and then frees the memory by a call to `free()`.

The input string consists of words, separated by whitespace character(s) (more than one whitespace character may separate two words). The paragraphs are separated by at least one empty line (i.e. at least two consecutive newline characters).

Formatting rules

- The output string is an ASCIIZ (binary zero terminated) string.
- The output test separates words by exactly one space and paragraph by exactly one empty line (i.e. two newlines)..
- If the input string is empty, the output will be an empty string.
- There are no spaces to the left of the first word on a line.
- There are not any spaces to the right of the last word on a a line. The newline character is present on all output lines..
- The words are left justified. If a word is too long to fit the line, the line is terminated and the word is placed as the first word on the next line..
- The function shall return NULL if the formatting failed (i.e. a word is wider than the width of the output).

The function cannot use C++ string data type, STL containers (`vector`, `list`, ...), nor standard library regular expressions. An attempt to use the above mentioned will lead to a compile error.

Submit a source file containing the implementation of the `wordWrap` function. The source file must contain the function itself and all your supplementary functions needed (called from) the function. On the other hand, the source file shall not contain `#include` preprocessor directives and `main` function (if the `#include` definitions and `main` function are inside a conditional compile block, they may stay in the submitted file). Use the code below as a basis for your development. If the preprocessor definitions and conditional compilation remain unmodified, the file may be submitted to the Progtest.

```
#ifndef __PROGTEST__
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <ctype.h>
#endif /* __PROGTEST__ */

/* your supplementary functions (if any) */
char * wordWrap ( char * str, int width )
```

```
 {
    /* implementation */
 }

#ifndef __PROGTEST__
int main ( int argc, char * argv [] )
 {
    /* your tests */
 }
#endif /* __PROGTEST__ */
```

Sample use:

```
char * str =
  "Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Integer metus\n"
  "pede, pretium vitae, rhoncus et, auctor sit amet, ligula. Integer volutpat\n"
  "orci et elit. Nunc tempus, urna at sollicitudin rutrum, arcu libero rhoncus\n"
  "lectus, vitae feugiat purus orci ultricies turpis. Pellentesque habitant\n"
  "morbi tristique senectus et netus et malesuada fames ac turpis egestas. Nam\n"
  "in pede. Etiam eu sem id urna ultricies congue. Vestibulum porttitor\n"
  "ultrices neque. Mauris semper, mauris ut feugiat ultricies, augue purus\n"
  "tincidunt  elit, eu interdum ante nisl ac ante. Pellentesque dui. Vestibulum\n"
  "pretium, augue non cursus pretium, nibh dolor laoreet leo, sed pharetra pede\n"
  "libero non diam.\n"
  "\n"
  "Proin est nisi,                    gravida ac, vulputate id, fringilla sit\n"
  "amet, magna. Nam congue cursus magna. In malesuada, velit a gravida sodales,\n"
  "dolor nisl vestibulum orci, sit amet sagittis mauris tellus nec purus. Nulla\n"
  "eget risus. Quisque nec sapien blandit odio convallis ullamcorper. Lorem\n"
  "ipsum dolor sit amet, consectetuer adipiscing elit. Pellentesque cursus.\n"
  "Aliquam tempus neque vitae libero molestie ut auctor.\n"
  "\n"
  "\n"
  "\n"
  "In nec massa eu tortor vulputate suscipit. Nam tristique magna nec pede. Sed\n"
  "a nisi. Nulla sed augue ut risus placerat porttitor. Ut aliquam. Nulla\n"
  "facilisi. Nulla vehicula nibh ac sapien. Nunc facilisis dapibus ipsum. Donec\n"
  "sed mauris. Nulla quam nisi, laoreet non, dignissim posuere, lacinia nec,\n"
  "turpis. Mauris malesuada nisi sed enim. In hac habitasse platea dictumst.\n"
  "Fusce    faucibus, turpis nec auctor posuere, nulla tellus scelerisque metus,\n"
  "quis molestie mi dui id quam. Mauris vestibulum. Nam ullamcorper.\n"
  "";

r = wordWrap ( str, 10 );
/* r = NULL */

r = wordWrap ( str, 40 );
/* r =
   "Lorem ipsum dolor sit amet, consectetuer\n"
   "adipiscing elit. Integer metus pede,\n"
   "pretium vitae, rhoncus et, auctor sit\n"
   "amet, ligula. Integer volutpat orci et\n"
   "elit. Nunc tempus, urna at sollicitudin\n"
   "rutrum, arcu libero rhoncus lectus,\n"
   "vitae feugiat purus orci ultricies\n"
   "turpis. Pellentesque habitant morbi\n"
   "tristique senectus et netus et malesuada\n"
   "fames ac turpis egestas. Nam in pede.\n"
   "Etiam eu sem id urna ultricies congue.\n"
   "Vestibulum porttitor ultrices neque.\n"
   "Mauris semper, mauris ut feugiat\n"
   "ultricies, augue purus tincidunt elit,\n"
```

```c
    "eu interdum ante nisl ac ante.\n"
    "Pellentesque dui. Vestibulum pretium,\n"
    "augue non cursus pretium, nibh dolor\n"
    "laoreet leo, sed pharetra pede libero\n"
    "non diam.\n"
    "\n"
    "Proin est nisi, gravida ac, vulputate\n"
    "id, fringilla sit amet, magna. Nam\n"
    "congue cursus magna. In malesuada, velit\n"
    "a gravida sodales, dolor nisl vestibulum\n"
    "orci, sit amet sagittis mauris tellus\n"
    "nec purus. Nulla eget risus. Quisque nec\n"
    "sapien blandit odio convallis\n"
    "ullamcorper. Lorem ipsum dolor sit amet,\n"
    "consectetuer adipiscing elit.\n"
    "Pellentesque cursus. Aliquam tempus\n"
    "neque vitae libero molestie ut auctor.\n"
    "\n"
    "In nec massa eu tortor vulputate\n"
    "suscipit. Nam tristique magna nec pede.\n"
    "Sed a nisi. Nulla sed augue ut risus\n"
    "placerat porttitor. Ut aliquam. Nulla\n"
    "facilisi. Nulla vehicula nibh ac sapien.\n"
    "Nunc facilisis dapibus ipsum. Donec sed\n"
    "mauris. Nulla quam nisi, laoreet non,\n"
    "dignissim posuere, lacinia nec, turpis.\n"
    "Mauris malesuada nisi sed enim. In hac\n"
    "habitasse platea dictumst. Fusce\n"
    "faucibus, turpis nec auctor posuere,\n"
    "nulla tellus scelerisque metus, quis\n"
    "molestie mi dui id quam. Mauris\n"
    "vestibulum. Nam ullamcorper.\n"
*/
free ( r );

r = wordWrap ( str, 80 );
/* r =
    "Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Integer metus pede,\n"
    "pretium vitae, rhoncus et, auctor sit amet, ligula. Integer volutpat orci et\n"
    "elit. Nunc tempus, urna at sollicitudin rutrum, arcu libero rhoncus lectus,\n"
    "vitae feugiat purus orci ultricies turpis. Pellentesque habitant morbi tristique\n"
    "senectus et netus et malesuada fames ac turpis egestas. Nam in pede. Etiam eu\n"
    "sem id urna ultricies congue. Vestibulum porttitor ultrices neque. Mauris\n"
    "semper, mauris ut feugiat ultricies, augue purus tincidunt elit, eu interdum\n"
    "ante nisl ac ante. Pellentesque dui. Vestibulum pretium, augue non cursus\n"
    "pretium, nibh dolor laoreet leo, sed pharetra pede libero non diam.\n"
    "\n"
    "Proin est nisi, gravida ac, vulputate id, fringilla sit amet, magna. Nam congue\n"
    "cursus magna. In malesuada, velit a gravida sodales, dolor nisl vestibulum orci,\n"
    "sit amet sagittis mauris tellus nec purus. Nulla eget risus. Quisque nec sapien\n"
    "blandit odio convallis ullamcorper. Lorem ipsum dolor sit amet, consectetuer\n"
    "adipiscing elit. Pellentesque cursus. Aliquam tempus neque vitae libero molestie\n"
    "ut auctor.\n"
    "\n"
    "In nec massa eu tortor vulputate suscipit. Nam tristique magna nec pede. Sed a\n"
    "nisi. Nulla sed augue ut risus placerat porttitor. Ut aliquam. Nulla facilisi.\n"
    "Nulla vehicula nibh ac sapien. Nunc facilisis dapibus ipsum. Donec sed mauris.\n"
    "Nulla quam nisi, laoreet non, dignissim posuere, lacinia nec, turpis. Mauris\n"
    "malesuada nisi sed enim. In hac habitasse platea dictumst. Fusce faucibus,\n"
    "turpis nec auctor posuere, nulla tellus scelerisque metus, quis molestie mi dui\n"
    "id quam. Mauris vestibulum. Nam ullamcorper.\n"
*/
```

```
free ( r );
```

Submit: ▮▮▮▮▮▮▮▮▮ **Submit**

☐ **Reference**