Source File: `~/2336/31/lab31.(C|CPP|cpp|c++|cc|cxx|cp)`
Input: Standard Input
Output: Standard Output
Value: 4

The computer company you work for is introducing a brand new computer line and is developing a new Unix-like operating system to be introduced along with the new computer. Your assignment is to write the formatter for the `ls` function.

Your program will eventually read input from a pipe (although for now your program will read from standard input). Input to your program will consist of a list of F filenames that you will sort (ascending based on the ASCII character values) and format into C columns based on the length L of the longest filename. Filenames will be between 1 and 60 (inclusive) characters in length and will be formatted into left-justified columns. The rightmost column will be the width of the longest filename and all other columns will be the width of the longest filename plus 2. There will be as many columns as will fit in 60 characters. Your program should use as few rows R as possible with columns being filled to capacity from left to right.

Input

The input will contain a list of filenames. There will be an unknown number of lines, each containing one left-justified filename and the entire line's contents (anywhere from 1 through 60 characters) are considered to be part of the filename. There will be no illegal characters in any of the filenames and no line will be completely empty.

The input should be read directly from the standard input device.

Output

For the set of filenames you should print a line of exactly 60 dashes (`-`) followed by the formatted columns of filenames. The sorted filenames 1 to R will be listed down column 1; filenames $R+1$ to $2R$ listed down column 2; etc.

The output should be written directly to the standard output device.

A sample execution sequence is shown in Figure 1. To use the `Makefile` as distributed in class, add a target of `lab31` to `targets1srcfile`.

```
1  newuser@csunix ~> cd 2336
2  newuser@csunix ~/2336> ./getlab.ksh 31
3    * Checking to see if a folder exists for Lab 31. . .No
4    * Creating a folder for Lab 31
5    * Checking to see if Lab 31 has sample input and output files. . .Yes
6    * Copying input and output files for Lab 31
7      from folder /usr/local/2336/data/31 to folder ./31
8    * Checking to see if /usr/local/2336/src/lab31main.C exists. . .No
9    * Checking to see if /usr/local/2336/include/lab31.h exists. . .No
10   * Copying file /usr/local/2336/src/Makefile to folder ./31
11   * Adding a target of lab31 to targets1srcfile
12   * Touching file ./31/lab31.cpp
13   * Edit file ./31/lab31.cpp in Notepad++
```

Figure 1. Commands to Compile, Link, & Run Lab 31 (Part 1 of 4)

```
14 newuser@csunix ~/2336> cd 31
15 newuser@csunix ~/2336/31> ls
16 01.dat     02.dat     03.dat     04.dat     Makefile
17 01.out     02.out     03.out     04.out     lab31.cpp
18 newuser@csunix ~/2336/31> make lab31
19 g++ -g -Wall -std=c++11 -c lab31.cpp -I/usr/local/2336/include -I.
20 g++ -o lab31 lab31.o -L/usr/local/2336/lib -lm -lbits
21 newuser@csunix ~/2336/31> cat 01.dat
22 much_longer_name
23 very_long_file_name
24 shorter
25 tiny
26 size-1
27 size2
28 12345678.123
29 mid_size_name
30 2short4me
31 size3
32 newuser@csunix ~/2336/31> cat 01.dat | ./lab31
33 Your Name - CS 2336 - Lab 31
34
35 ------------------------------------------------------------
36 12345678.123         size-1
37 2short4me            size2
38 mid_size_name        size3
39 much_longer_name     tiny
40 shorter              very_long_file_name
41 newuser@csunix ~/2336/31> cat 01.dat | ./lab31 > my.out
42 newuser@csunix ~/2336/31> diff 01.out my.out
43 newuser@csunix ~/2336/31> cat 02.dat
44 Weaser
45 Alfalfa
46 Stimey
47 Buckwheat
48 Porky
49 Joe
50 Darla
51 Cotton
52 Butch
53 Froggy
54 Mrs_Crabapple
55 P.D.
```

Figure 1. Commands to Compile, Link, & Run Lab 31 (Part 2 of 4)

```
newuser@csunix ~/2336/31> cat 02.dat | ./lab31
Your Name - CS 2336 - Lab 31

------------------------------------------------------------
Alfalfa        Cotton         Joe            Porky
Buckwheat      Darla          Mrs_Crabapple  Stimey
Butch          Froggy         P.D.           Weaser
newuser@csunix ~/2336/31> cat 02.dat | ./lab31 > my.out
newuser@csunix ~/2336/31> diff 02.out my.out
newuser@csunix ~/2336/31> cat 03.dat
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
newuser@csunix ~/2336/31> cat 03.dat | ./lab31
Your Name - CS 2336 - Lab 31

------------------------------------------------------------
a  c  e  g  i  k  m  o  q  s  u  w  y
b  d  f  h  j  l  n  p  r  t  v  x  z
newuser@csunix ~/2336/31> cat 03.dat | ./lab31 > my.out
newuser@csunix ~/2336/31> diff 03.out my.out
```

Figure 1. Commands to Compile, Link, & Run Lab 31 (Part 3 of 4)

```
100 newuser@csunix ~/2336/31> cat 04.dat
101 abcdefg
102 bcdefgh
103 cdefghi
104 defghij
105 efghijk
106 fghijkl
107 ghijklm
108 hijklmn
109 ijklmno
110 jklmnop
111 klmnopq
112 lmnopqr
113 1111111
114 mnopqrs
115 nopqrst
116 opqrstu
117 pqrstuv
118 qrstuvw
119 rstuvwx
120 stuvwxy
121 tuvwxyz
122 newuser@csunix ~/2336/31> cat 04.dat | ./lab31
123 Your Name - CS 2336 - Lab 31
124
125 ------------------------------------------------------------
126 1111111  defghij  hijklmn  lmnopqr  pqrstuv  tuvwxyz
127 abcdefg  efghijk  ijklmno  mnopqrs  qrstuvw
128 bcdefgh  fghijkl  jklmnop  nopqrst  rstuvwx
129 cdefghi  ghijklm  klmnopq  opqrstu  stuvwxy
130 newuser@csunix ~/2336/31> cat 04.dat | ./lab31 > my.out
131 newuser@csunix ~/2336/31> diff 04.out my.out
132 newuser@csunix ~/2336/31>
```

Figure 1. Commands to Compile, Link, & Run Lab 31 (Part 4 of 4)