```c
/*
 * C program by Dave Russillo. Made for CS1311.
 * Transposes videogame names from horizontal to vertical.
 */
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main(void) {
  char names[20][60];  // 20x60 array of chars for names
  FILE *in;  // input file
  FILE *out;  // output file
  int max_length = 0;  // used to print the necessary lines only
  int i;  // iteration
  int j;  // iteration
  in = fopen("names.txt", "r");  // open input file
  out = fopen("transpose.txt", "w");  // open output file

  printf("This program takes twenty videogame names from names.txt "
         "and transposes them from horizontal to vertical. \n\n");

  // initialize names with blank spaces
  for(i = 0; i < 20; i++) {

    for(j = 0; j < 60; j++) {
      names[i][j] = ' ';  // replace each char in each string with ' '
    }
  }

  // read names from names.txt and set newline characters to null characters
  for(i = 0; i < 20; i++) {
    fgets(names[i], 60, in);
    names[i][strcspn(names[i], "\n")] = '\0';
    // uses strcspn which gives the index of the first appearance of a character
  }

  // find length of longest name
  for(i = 0; i < 20; i++) {
    if(strlen(names[i]) > max_length) {
      max_length = strlen(names[i]);
    }
    // remove null characters for later
    names[i][strcspn(names[i], "\0")] = ' ';  // remove first one (prev. newline)
    names[i][strcspn(names[i], "\0")] = ' ';  // remove second one
  }

  // transpose and add spaces
```

```c
47        // for each character position from 0 to the length of the longest name
48        for(i = 0; i < max_length; i++) {
49          for(j = 0; j < 20; j++) {   // for each name
50            // print out the character and two spaces
51            fprintf(stdout, "%c  ", names[j][i]);   // to stdout
52            fprintf(out, "%c  ", names[j][i]);   // to transpose.txt
53          }
54          // add newline between each line to stdout and transpose.txt
55          fprintf(stdout, "\n");
56          fprintf(out, "\n");
57        }
58
59        // close files
60        fclose(in);
61        fclose(out);
62        return 0;
63      }
```

names.txt - Notepad

File   Edit   Format   View   Help

Doom Eternal
Minecraft
Grand Theft Auto V
Rainbow Six Siege
Super Mario Bros
Garfield Kart
Mario Kart Wii
Ultimate Pool
Hand Simulator
Red Dead Redemption 2
Watch Dogs
American Truck Simulator
Batman Arkham Asylum
Just Cause 3
Superliminal
SUPERHOT
Assetto Corsa
Boneworks
Hitman
Max Payne 3

transpose.txt - Notepad

File   Edit   Format   View   Help

```
D  M  G  R  S  G  M  U  H  R  W  A  B  J  S  S  A  B  H  M
o  i  r  a  u  a  a  l  a  e  a  m  a  u  u  U  s  o  i  a
o  n  a  i  p  r  r  t  n  d  t  e  t  s  p  P  s  n  t  x
m  e  n  n  e  f  i  i  d        c  r  m  t  e  E  e  e  m
   c  d  b  r  i  o  m     D  h  i  a     r  R  t  w  a  P
E  r     o     e     a  S  e     c  n  C  l  H  t  o  n  a
t  a  T  w  M  l  K  t  i  a  D  a     a  i  O  o  r     y
e  f  h     a  d  a  e  m  d  o  n  A  u  m  T        k  n
r  t  e  S  r     r     u     g     r  s  i     C     s  e
n     f  i  i  K  t  P  l  R  s  T  k  e  n     o        3
a     t  x  o  a     o  a  e     r  h  a  3  l     o
l           r  W  t  i  l  o  t  d     u     m        s
         A  S  B  t  i  l  o  r  e     c     a     a
         u  i  r     i        m     k
         t  e  o           p     S  A
         o  g  s           t     i  s
         V                 i     m  y
                           o     u  l
                           n     l  u
                                 a  m
                           2     t
                                 o
                                 r
```

```
$ ./Transpose.exe
This program takes twenty videogame names from names.txt and transposes them from horizontal to vertical.
```