ECE 270

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Quiz #6 - Part 2
Hangman Game

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1. Statement of the Problem

This program upgrades the word guessing game from Quiz#6 - Part 1 to a full featured Hangman game. For brevity, this report assumes that you have read the report on Part 1 and, as such, will focus on the new functionality added in Part 2 instead of the basic functions already covered in Part 1.

2. Description of solution

All program output is printed to the screen and a text file names quiz6part2.txt.

Part 2 uses the same loops and logic as Part 1, but allows a "Player 1" to set the mystery word and number of allowed guesses, the addition of which required replacing all pre-defined win and lose conditions with conditions based on the game parameters set by "Player 1":

This loop initializes the game progress display with '-'s based on the length of the entered mystery word:

```
for(j=0;j<strlen(word);j++)
      {
          display[j]='-';
      }
```

This line from part 1:

```
while((correctCounter<10)&&(guessCounter<10))
```

Is replaced by this:

```
while((correctCounter<strlen(word))&&(guessCounter<maxGuesses))
```

Showing the change in win/lose conditions.

A separate function, `void gameDisplay(float , FILE *);`, is defined that is used the display the graphics for the current game state. The `gameDisplay` function has the percentage of incorrect guesses as a proportion of total guesses and the file pointer for outputting to quiz6part2.txt passed into it.

```
wrongGuesses=(guessCounter-correctCounter);
percentWrong=(float)wrongGuesses/(float)maxGuesses;
```

The program then uses the Windows console command `system("cls");` to clear the output window before displaying the current game state:

```
gameDisplay(percentWrong, fp);
```

`gameDisplay` then uses a series of if statements to determine how much of the hangman to display.

Sample of `if` statement determining game display based on percentage of wrong guesses:

```
if (wrong>0&&wrong<.1)
      {
            printf("\n|--------------------|");
            printf("\n|                    |");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
            printf("\n|");
      }
```

3. Output and Testing

To test the program I ran it a series of times, attached are samples of a winning game and a losing game.

Win:

```
Hangman Game

Please enter a word for the player to guess: won

Please enter how many guesses the player should get: 5
Begin Game!

Try # 1
Guess a letter: w
w--

Try # 2
Guess a letter: i
|--------------------|
|                    |
|                  |   |
|                  |   |
|                    |
|                |-------|
|                |       |
|                |       |
|                |       |
|                |       |
|                 -------
|
|
```

```
|
|
|
|
w--
```

-------OUTPUT TRUNCATED--------

```
Try # 4
Guess a letter: n
|--------------------|
|                     |
|                   |   |
|                   |   |
|                     |
|                 |-------|
|                 |       |
|                 |       |
|                 |       |
|                 |       |
|                  -------
|
|
|
|
|
|
won
Congrats, You WIN!!

Won in 4 guesses
```

Lose:

```
Hangman Game

Please enter a word for the player to guess: verified

Please enter how many guesses the player should get: 17
Begin Game!

Try # 1
Guess a letter: v
v-------

Try # 2
Guess a letter: g
|--------------------|
|                     |
|
|
|
|
|
|
|
|
|
```

```
|
|
v-------
                              -------OUTPUT TRUNCATED--------
Try # 17
Guess a letter: c
|--------------------|
|                     |
|                   |   |
|                   |   |
|                     |
|               |-|-------|-|
|               | |       | |
|               | |       | |
|               | |       | |
|               m |       | m
|                   -------
|                 |
|                 |
|                 |
|                 |
|                 b
|
verifie-
Sorry, you lost

|--------------------|
|                     |
|                   |x x|
|                   | o |
|                     |
|               |-|-------|-|
|               | | Y O U | |
|               | |       | |
|               | | LOST..| |
|               m |       | m
|                   -------
|                 |       |
|                 |       |
|                 |       |
|                 |       |
|                 b       b
|

 Your guess:          verifie-

The mystery word was: verified
```

4. Code

```
1  /* Justin Newman
2  Quiz #6 Part 2:
3  Hangman Game
4  ECE 270 9/28/14
```

```
 */

#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#include<conio.h>

//prototype of function to display hangman status
void gameDisplay(float , FILE *);

int main()
    {
        //Declare and initialize variables
        char word[100], display[strlen(word)], guess;
        int i=0, j=0, correctCounter=0, guessCounter=0, maxGuesses=10,
wrongGuesses=0;
        float percentWrong=0;

        //Open file and prepare to write output to it
        FILE *fp;
        fp=fopen("quiz6part2.txt","w");

        printf("Hangman Game");
        fprintf(fp,"Hangman Game");

        //Allow player #1 to set mystery word and number of guesses allowed
        printf("\n\nPlease enter a word for the player to guess: ");
        scanf(" %s",&word);
        fprintf(fp,"\n\nPlease enter a word for the player to guess: %s",word);

        printf("\n\nPlease enter how many guesses the player should get: ");
        scanf(" %d",&maxGuesses);
        fprintf(fp,"\n\nPlease enter how many guesses the player should get:
%d",maxGuesses);

        //Clear screen
        system("cls");

        printf("\nBegin Game!");
        fprintf(fp,"\nBegin Game!");

        //Populate display array with '-' for each letter in the mystery word
        for(j=0;j<strlen(word);j++)
            {
                display[j]='-';
            }

        display[strlen(word)]='\0';

        //Game continues until the number of correct guesses is less than the
length of the mystery word
        //Game continues until the number of guesses equals the maximum guesses
allowed
        while((correctCounter<strlen(word))&&(guessCounter<maxGuesses))

```

```
56              {
57
58                  guessCounter++;
59
60                  printf("\n\nTry # %d",guessCounter);
61                  fprintf(fp,"\n\nTry # %d",guessCounter);
62
63                  printf("\nGuess a letter: ");
64                  scanf("\n%c",&guess);
65                  fprintf(fp,"\nGuess a letter: %c",guess);
66
67                  for (i=0;i<strlen(word);i++)
68
69                      {
70
71
72                          if ((guess==word[i])&&(display[i]=='-'))
73
74                              {
75                                  display[i]=guess;
76                                  correctCounter++;
77
78                              }
79
80
81                      }
82                  //Setting up wrong guess percentage to be passed to display
function
83                  wrongGuesses=(guessCounter-correctCounter);
84                  percentWrong=(float)wrongGuesses/(float)maxGuesses;
85
86                  //Functions to simplify debugging
87                  //printf("%f",percentWrong); - debug
88                  //printf("%d",wrongGuesses); - debug
89
90                  //Clear screen
91                  system("cls");
92
93                  //Display current game status
94                  gameDisplay(percentWrong, fp);
95
96                  printf("\n%s",display);
97                  fprintf(fp,"\n%s",display);
98
99              }
100
101         system("cls");
102
103         //Determines if game was won/lost and displays accordingly
104         if (correctCounter==strlen(word))
105             {
106                 printf("\nCongrats, You WIN!!");
107                 printf("\n\nWon in %d guesses", guessCounter);
108
109                 fprintf(fp,"\nCongrats, You WIN!!");
```

```
110                 fprintf(fp,"\n\nWon in %d guesses", guessCounter);
111             }
112         else
113             {
114                 printf("\nSorry, you lost\n");
115                 fprintf(fp,"\nSorry, you lost\n");
116 
117                 gameDisplay(1.0, fp);
118 
119                 printf("\n\nYour guess:           %s",display);
120                 fprintf(fp,"\n\n Your guess:          %s",display);
121 
122                 printf("\n\nThe mystery word was: %s\n",word);
123                 fprintf(fp,"\n\nThe mystery word was: %s",word);
124 
125             }
126 
127         fclose(fp);
128         return 0;
129 
130     }
131 
132 //Function displays hangman based on wrong guesses as a percent of total guesses
133 void gameDisplay(float wrong,FILE *disp)
134     {
135 
136         if (wrong>0&&wrong<.1)
137                     {
138                         printf("\n|--------------------|");
139                         printf("\n|                    |");
140                         printf("\n|");
141                         printf("\n|");
142                         printf("\n|");
143                         printf("\n|");
144                         printf("\n|");
145                         printf("\n|");
146                         printf("\n|");
147                         printf("\n|");
148                         printf("\n|");
149                         printf("\n|");
150                         printf("\n|");
151                         printf("\n|");
152 
153                         fprintf(disp,"\n|--------------------|");
154                         fprintf(disp,"\n|                    |");
155                         fprintf(disp,"\n|");
156                         fprintf(disp,"\n|");
157                         fprintf(disp,"\n|");
158                         fprintf(disp,"\n|");
159                         fprintf(disp,"\n|");
160                         fprintf(disp,"\n|");
161                         fprintf(disp,"\n|");
162                         fprintf(disp,"\n|");
163                         fprintf(disp,"\n|");
164                         fprintf(disp,"\n|");
```

```
165                     fprintf(disp,"\n|");
166                 }
167             else if (wrong>=.1&&wrong<.2)
168                 {
169                     printf("\n|--------------------|");
170                     printf("\n|                    |");
171                     printf("\n|                  |   |");
172                     printf("\n|                  |   |");
173                     printf("\n|");
174                     printf("\n|");
175                     printf("\n|");
176                     printf("\n|");
177                     printf("\n|");
178                     printf("\n|");
179                     printf("\n|");
180                     printf("\n|");
181                     printf("\n|");
182                     printf("\n|");
183                     printf("\n|");
184                     printf("\n|");
185                     printf("\n|");
186
187                     fprintf(disp,"\n|--------------------|");
188                     fprintf(disp,"\n|                    |");
189                     fprintf(disp,"\n|                  |   |");
190                     fprintf(disp,"\n|                  |   |");
191                     fprintf(disp,"\n|");
192                     fprintf(disp,"\n|");
193                     fprintf(disp,"\n|");
194                     fprintf(disp,"\n|");
195                     fprintf(disp,"\n|");
196                     fprintf(disp,"\n|");
197                     fprintf(disp,"\n|");
198                     fprintf(disp,"\n|");
199                     fprintf(disp,"\n|");
200                     fprintf(disp,"\n|");
201                     fprintf(disp,"\n|");
202                     fprintf(disp,"\n|");
203                     fprintf(disp,"\n|");
204
205                 }
206             else if (wrong>=.2&&wrong<.3)
207                 {
208                     printf("\n|--------------------|");
209                     printf("\n|                    |");
210                     printf("\n|                  |   |");
211                     printf("\n|                  |   |");
212                     printf("\n|                    |");
213                     printf("\n|                |-------|");
214                     printf("\n|                |       |");
215                     printf("\n|                |       |");
216                     printf("\n|                |       |");
217                     printf("\n|                |       |");
218                     printf("\n|                 ------- ");
219                     printf("\n|");
```

```
220                     printf("\n|");
221                     printf("\n|");
222                     printf("\n|");
223                     printf("\n|");
224                     printf("\n|");
225
226                     fprintf(disp,"\n|--------------------|");
227                     fprintf(disp,"\n|                    |");
228                     fprintf(disp,"\n|                  |   |");
229                     fprintf(disp,"\n|                  |   |");
230                     fprintf(disp,"\n|                    |");
231                     fprintf(disp,"\n|                |-------|");
232                     fprintf(disp,"\n|                |       |");
233                     fprintf(disp,"\n|                |       |");
234                     fprintf(disp,"\n|                |       |");
235                     fprintf(disp,"\n|                |       |");
236                     fprintf(disp,"\n|                 ------- ");
237                     fprintf(disp,"\n|");
238                     fprintf(disp,"\n|");
239                     fprintf(disp,"\n|");
240                     fprintf(disp,"\n|");
241                     fprintf(disp,"\n|");
242                     fprintf(disp,"\n|");
243                 }
244             else if (wrong>=.3&&wrong<.4)
245                 {
246                     printf("\n|--------------------|");
247                     printf("\n|                    |");
248                     printf("\n|                  |   |");
249                     printf("\n|                  |   |");
250                     printf("\n|                    |");
251                     printf("\n|              |-|-------|");
252                     printf("\n|              | |       |");
253                     printf("\n|              | |       |");
254                     printf("\n|              | |       |");
255                     printf("\n|              m |       |");
256                     printf("\n|                 ------- ");
257                     printf("\n|");
258                     printf("\n|");
259                     printf("\n|");
260                     printf("\n|");
261                     printf("\n|");
262                     printf("\n|");
263
264                     fprintf(disp,"\n|--------------------|");
265                     fprintf(disp,"\n|                    |");
266                     fprintf(disp,"\n|                  |   |");
267                     fprintf(disp,"\n|                  |   |");
268                     fprintf(disp,"\n|                    |");
269                     fprintf(disp,"\n|              |-|-------|");
270                     fprintf(disp,"\n|              | |       |");
271                     fprintf(disp,"\n|              | |       |");
272                     fprintf(disp,"\n|              | |       |");
273                     fprintf(disp,"\n|              m |       |");
274                     fprintf(disp,"\n|                 ------- ");
```

```
275                     fprintf(disp,"\n|");
276                     fprintf(disp,"\n|");
277                     fprintf(disp,"\n|");
278                     fprintf(disp,"\n|");
279                     fprintf(disp,"\n|");
280                     fprintf(disp,"\n|");
281
282                 }
283             else if (wrong>=.4&&wrong<.5)
284                 {
285                     printf("\n|--------------------|");
286                     printf("\n|                    |");
287                     printf("\n|                  |   |");
288                     printf("\n|                  |   |");
289                     printf("\n|                    |");
290                     printf("\n|              |-|-------|-|");
291                     printf("\n|              | |       | |");
292                     printf("\n|              | |       | |");
293                     printf("\n|              | |       | |");
294                     printf("\n|              m |       | m");
295                     printf("\n|                 -------   ");
296                     printf("\n|");
297                     printf("\n|");
298                     printf("\n|");
299                     printf("\n|");
300                     printf("\n|");
301                     printf("\n|");
302
303                     fprintf(disp,"\n|--------------------|");
304                     fprintf(disp,"\n|                    |");
305                     fprintf(disp,"\n|                  |   |");
306                     fprintf(disp,"\n|                  |   |");
307                     fprintf(disp,"\n|                    |");
308                     fprintf(disp,"\n|              |-|-------|-|");
309                     fprintf(disp,"\n|              | |       | |");
310                     fprintf(disp,"\n|              | |       | |");
311                     fprintf(disp,"\n|              | |       | |");
312                     fprintf(disp,"\n|              m |       | m");
313                     fprintf(disp,"\n|                 -------   ");
314                     fprintf(disp,"\n|");
315                     fprintf(disp,"\n|");
316                     fprintf(disp,"\n|");
317                     fprintf(disp,"\n|");
318                     fprintf(disp,"\n|");
319                     fprintf(disp,"\n|");
320
321                 }
322             else if (wrong>=.5&&wrong<.6)
323                 {
324                     printf("\n|--------------------|");
325                     printf("\n|                    |");
326                     printf("\n|                  |   |");
327                     printf("\n|                  |   |");
328                     printf("\n|                    |");
329                     printf("\n|              |-|-------|-|");
```

```
330                     printf("\n|              | |       | |");
331                     printf("\n|              | |       | |");
332                     printf("\n|              | |       | |");
333                     printf("\n|             m |       | m");
334                     printf("\n|                -------   ");
335                     printf("\n|               |");
336                     printf("\n|               |");
337                     printf("\n|               |");
338                     printf("\n|               |");
339                     printf("\n|               b");
340                     printf("\n|");
341
342                     fprintf(disp,"\n|--------------------|");
343                     fprintf(disp,"\n|                    |");
344                     fprintf(disp,"\n|                  |   |");
345                     fprintf(disp,"\n|                  |   |");
346                     fprintf(disp,"\n|                    |");
347                     fprintf(disp,"\n|              |-|-------|-|");
348                     fprintf(disp,"\n|              | |       | |");
349                     fprintf(disp,"\n|              | |       | |");
350                     fprintf(disp,"\n|              | |       | |");
351                     fprintf(disp,"\n|             m |       | m");
352                     fprintf(disp,"\n|                -------   ");
353                     fprintf(disp,"\n|               |");
354                     fprintf(disp,"\n|               |");
355                     fprintf(disp,"\n|               |");
356                     fprintf(disp,"\n|               |");
357                     fprintf(disp,"\n|               b");
358                     fprintf(disp,"\n|");
359
360                 }
361             else if (wrong>=.6&&wrong<.7)
362                 {
363                     printf("\n|--------------------|");
364                     printf("\n|                    |");
365                     printf("\n|                  |   |");
366                     printf("\n|                  |   |");
367                     printf("\n|                    |");
368                     printf("\n|              |-|-------|-|");
369                     printf("\n|              | |       | |");
370                     printf("\n|              | |       | |");
371                     printf("\n|              | |       | |");
372                     printf("\n|             m |       | m");
373                     printf("\n|                -------   ");
374                     printf("\n|               |       |");
375                     printf("\n|               |       |");
376                     printf("\n|               |       |");
377                     printf("\n|               |       |");
378                     printf("\n|               b       b");
379                     printf("\n|");
380
381                     fprintf(disp,"\n|--------------------|");
382                     fprintf(disp,"\n|                    |");
383                     fprintf(disp,"\n|                  |   |");
384                     fprintf(disp,"\n|                  |   |");
```

```
                    fprintf(disp,"\n|                    |");
                    fprintf(disp,"\n|                |-|-------|-|");
                    fprintf(disp,"\n|                | |       | |");
                    fprintf(disp,"\n|                | |       | |");
                    fprintf(disp,"\n|                | |       | |");
                    fprintf(disp,"\n|                m |       | m");
                    fprintf(disp,"\n|                   -------   ");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  b       b");
                    fprintf(disp,"\n|");

                }
            else if (wrong>=.7&&wrong<.8)
                {
                    printf("\n|--------------------|");
                    printf("\n|                    |");
                    printf("\n|                   |o  |");
                    printf("\n|                   |   |");
                    printf("\n|                    |");
                    printf("\n|                |-|-------|-|");
                    printf("\n|                | |       | |");
                    printf("\n|                | |       | |");
                    printf("\n|                | |       | |");
                    printf("\n|                m |       | m");
                    printf("\n|                   -------   ");
                    printf("\n|                  |       |");
                    printf("\n|                  |       |");
                    printf("\n|                  |       |");
                    printf("\n|                  |       |");
                    printf("\n|                  b       b");
                    printf("\n|");

                    fprintf(disp,"\n|--------------------|");
                    fprintf(disp,"\n|                    |");
                    fprintf(disp,"\n|                   |o  |");
                    fprintf(disp,"\n|                   |   |");
                    fprintf(disp,"\n|                    |");
                    fprintf(disp,"\n|                |-|-------|-|");
                    fprintf(disp,"\n|                | |       | |");
                    fprintf(disp,"\n|                | |       | |");
                    fprintf(disp,"\n|                | |       | |");
                    fprintf(disp,"\n|                m |       | m");
                    fprintf(disp,"\n|                   -------   ");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  |       |");
                    fprintf(disp,"\n|                  b       b");
                    fprintf(disp,"\n|");

                }
            else if (wrong>=.8&&wrong<1.0)
```

```
440                     {
441                         printf("\n|--------------------|");
442                         printf("\n|                    |");
443                         printf("\n|                  |o o|");
444                         printf("\n|                  |   |");
445                         printf("\n|                    |");
446                         printf("\n|              |-|-------|-|");
447                         printf("\n|              | |       | |");
448                         printf("\n|              | |       | |");
449                         printf("\n|              | |       | |");
450                         printf("\n|              m |       | m");
451                         printf("\n|                 -------   ");
452                         printf("\n|                |       |");
453                         printf("\n|                |       |");
454                         printf("\n|                |       |");
455                         printf("\n|                |       |");
456                         printf("\n|                b       b");
457                         printf("\n|");
458
459                         fprintf(disp,"\n|--------------------|");
460                         fprintf(disp,"\n|                    |");
461                         fprintf(disp,"\n|                  |o o|");
462                         fprintf(disp,"\n|                  |   |");
463                         fprintf(disp,"\n|                    |");
464                         fprintf(disp,"\n|              |-|-------|-|");
465                         fprintf(disp,"\n|              | |       | |");
466                         fprintf(disp,"\n|              | |       | |");
467                         fprintf(disp,"\n|              | |       | |");
468                         fprintf(disp,"\n|              m |       | m");
469                         fprintf(disp,"\n|                 -------   ");
470                         fprintf(disp,"\n|                |       |");
471                         fprintf(disp,"\n|                |       |");
472                         fprintf(disp,"\n|                |       |");
473                         fprintf(disp,"\n|                |       |");
474                         fprintf(disp,"\n|                b       b");
475                         fprintf(disp,"\n|");
476
477                     }
478                 else if (wrong==1.0)
479                     {
480                         printf("\n|--------------------|");
481                         printf("\n|                    |");
482                         printf("\n|                  |o o|");
483                         printf("\n|                  | Q |");
484                         printf("\n|                    |");
485                         printf("\n|              |-|-------|-|");
486                         printf("\n|              | | Y o u | |");
487                         printf("\n|              | |       | |");
488                         printf("\n|              | | Lose..| |");
489                         printf("\n|              m |       | m");
490                         printf("\n|                 -------   ");
491                         printf("\n|                |       |");
492                         printf("\n|                |       |");
493                         printf("\n|                |       |");
494                         printf("\n|                |       |");
```

```
495                         printf("\n|                b       b");
496                         printf("\n|");
497
498                         fprintf(disp,"\n|--------------------|");
499                         fprintf(disp,"\n|                    |");
500                         fprintf(disp,"\n|                  |x x|");
501                         fprintf(disp,"\n|                  | o |");
502                         fprintf(disp,"\n|                    |");
503                         fprintf(disp,"\n|              |-|-------|-|");
504                         fprintf(disp,"\n|              | | Y O U | |");
505                         fprintf(disp,"\n|              | |       | |");
506                         fprintf(disp,"\n|              | | LOST..| |");
507                         fprintf(disp,"\n|              m |       | m");
508                         fprintf(disp,"\n|                 -------   ");
509                         fprintf(disp,"\n|                |       |");
510                         fprintf(disp,"\n|                |       |");
511                         fprintf(disp,"\n|                |       |");
512                         fprintf(disp,"\n|                |       |");
513                         fprintf(disp,"\n|                  b       b");
514                         fprintf(disp,"\n|");
515                     }
516     }
```