Lab 2: Solving Simple Problems in C

LAB 2

SECTION C

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Problem

The purpose of this lab was to showcase all of the past skills learned so far and to implement them all in one in a practical, and fun lab. It involved knowledge of functions, scanf and printf, conditionals, logical thinking, switch statements, and provided libraries by C.

Analysis

The entire lab was practical applications of what was covered in past labs. Scanf statements to take the inputs from the controllers and then running those inputs through conditionals that progressed the program further, checking for improper inputs. Exiting the loop if the wrong input is read or if the player times out. Running the inputs through functions defined by ourselves in the program.

Design

The first problems for the lab was getting all the things in the right place. Making sure the starting point actually started the game, making sure the middle didn't end suddenly and making sure the ending point out putted the proper ending variables. This was all preformed with A LOT of conditionals and variables to test and make sure things are only outputted once.

Testing

This lab was a lot of little development, stop, test, fix errors, repeat. The one time I didn't, it ended up being 150 lines of code with an error somewhere in the loop causing it to mess up. There was a lot of print statements in loops to see if you make it too the loop before you get a bug, or if it is outside the loop, there are a lot of print statements outputting button values and time values to ensure time and buttons are reading properly, there was a lot of reconnecting controllers to ensure they actually work properly.

Comments

I loved this lab because it was one of the first really fun applications from this course that I could show to friends not involved and have them go "Wow that's actually pretty cool." It was so satisfying to just have them be more interested than "Wow, you coded… That amazing." They actually wanted to just keep playing it and trying to set high scores, some of them found my cheat code and started to exploit it and others just kept trying to push the button as much as possible as fast as possible to beat the timer.

Questions

1. How did you randomize the buttons that needed to be pressed?

I used switch statements and the rand() function defined by c. Case 0 runs the random function which gives a number between 1 and 4. These numbers are set to the variables that controls the case statement, which then sends them to cases 1 through 4. After the cases execute properly, it sends you back to 0 to re-run the random number generator again.

2. What game states, if any, did you keep track of?

   I kept track of the start, the middle, and the end. The Start pretty much was only used once, to reset all variables one more time and make sure you pressed something to start it. The middle was the biggest and it checked to make sure the game was running and what ending you get, be it a time out or wrong button. The ending was keeping track of how you lost, with a wrong button press or a time out.

3. What mechanism did you use to make sure extraneous button presses were not registered?

   I added a delay to all cases 1 through 4. You have a quarter of a second before it reads any more inputs again, at that point if you still holding the button down you will be failed out. But it gives you room to react and remove your thumb, much more time than what was previously done.

Source Code

<Use NPP Exporter to PASTE source code>

```
/*---------------------------------------------------------------------------
--
-                                       SE 185 Lab 06
-             Developed for 185-Rursch by T.Tran and K.Wang
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-     Date:       10/9/2018
-----------------------------------------------------------------------------
*/

/*---------------------------------------------------------------------------
--
-                                 Includes
-----------------------------------------------------------------------------
*/
#include <stdio.h>
#include <time.h>
#include <stdlib.h>
#include <windows.h>

/*---------------------------------------------------------------------------
--
-                                  Defines
```

```
-----------------------------------------------------------------------------
*/
#define TRUE 1
#define FALSE 0


/*---------------------------------------------------------------------------
--
-                                 Prototypes
-----------------------------------------------------------------------------
*/
int startB(int b);

/*---------------------------------------------------------------------------
--
-                             Implementation
-----------------------------------------------------------------------------
*/
int main()
{

int t, b1, b2, b3, b4, gNum;
int startPrint, tR,currentTime, sI,  starting, begin, rng, tR2 = 0;
int check1 = 0;
int check2 = 0;
int check3 = 0;
int check4 = 0;
int check5 = 0;
int points = 0;
int tDif1 = 0;
int rt = 4000;

srand(time(NULL));

int win = 1;

      while(win == 1){

            scanf("%d, %d, %d, %d, %d", &t, &b1, &b2, &b3, &b4 );

            if(startPrint == 0){

                  printf("Please Press Circle - O - to Start! \n");
                  startPrint = 1;

            }

            //printf("%d \n", check1);

            if(check1 == 0){

                  //printf("Hi \n");

                  if(startB(b2) == 1){

                        starting = 1;
                        check1 = 1;
```

```
    }
}


if(b1 == 1 && b3 == 1){

    if(check5 == 0){
        printf("Cheat mode engaged, adding 30 second!");
        rt = rt + 30000;
        check5 = 1;
    }

}

if(starting == 1){

    if(begin ==0){

        if (sI == 0){

            printf("Starting!\n");
            begin = 1;
            sI = 1;

        }

    } else {

        switch(rng){
            case 0:

                if(check4 == 0){
                    printf("Press...: \n");
                    check4 = 1;
                }

                check2 = 0;
                tR2 = 0;
                tDif1 = t;


                if(check3 == 0){

                    if(tR == 0){
                        tDif1 = t;
                        tR = 1;
                    }

                        rng = rand() % 4 + 1;
                        check3 == 1;
                }

                break;

            case 1:
```

```
                                    if(check2 == 0){

                                          printf(" Square! [] \n");
                                          printf("You have %d 
milliseconds!\n", rt);

                                          check4 = 0;
                                          tR = 0;
                                          check2 = 1;
                                    }

                                    if(t - tDif1 < rt){

                                          if(tR2 == 0){

                                                tDif1 = t;
                                                tR2 = 1;

                                          }

                                          if(t - tDif1 > 250){
                                                if(b4 == 1){

                                                      if(check4 == 0){
                                                            printf("Nice 
work!\n");

                                                            check4 = 1;
                                                      }
                                                      points++;

                                                      rt = rt - 100;

                                                      check3 == 0;


                                                            rng = 0;

                                                }else if(b1 == 1){

                                                      printf("Wrong button! 
\n");

                                                      printf("Your score was: 
%d", points);

                                                      win = 0;

                                                }else if(b2 == 1){

                                                      printf("Wrong button! 
\n");

                                                      printf("Your score was: 
%d", points);

                                                      win = 0;

                                                }else if(b3 == 1){

                                                      printf("Wrong button! 
\n");
```

```
                                                      printf("Your score was:
%d", points);
                                                      win = 0;

                                                }
                                          }

                                    }else{

                                          printf("Sorry, you took to long.
try again! \n");

                                          printf("Your score was: %d",
points);

                                          win = 0;

                                    }


                                    break;

                              case 2:

                                    if(check2 == 0){

                                          printf(" X! \n");
                                          printf("You have %d
milliseconds!\n", rt);

                                          check4 = 0;
                                          tR = 0;
                                          check2 = 1;
                                    }

                                    if(t - tDif1 < rt){

                                          if(tR2 == 0){

                                                tDif1 = t;
                                                tR2 = 1;

                                          }

                                          if(t - tDif1 > 250){
                                                if(b3 == 1){

                                                      if(check4 == 0){
                                                            printf("Nice
work!\n");

                                                            check4 = 1;
                                                      }

                                                      points++;

                                                      rt = rt - 100;

                                                      check3 == 0;
```

```
                tDif1 = t;

                    rng = 0;
            }else if(b1 == 1){
                printf("Wrong button! \n");
                printf("Your score was: %d", points);
                win = 0;
            }else if(b2 == 1){
                printf("Wrong button! \n");
                printf("Your score was: %d", points);
                win = 0;
            }else if(b4 == 1){
                printf("Wrong button! \n");
                printf("Your score was: %d", points);
                win = 0;
            }
        }
    }else{
        printf("Sorry, you took to long. try again! \n");

        printf("Your score was: %d", points);

        win = 0;
    }

    break;
case 3:
    if(check2 == 0){
        printf(" Circle! O \n");
        printf("You have %d milliseconds!\n", rt);
        check4 = 0;
        tR = 0;
        check2 = 1;
    }
```

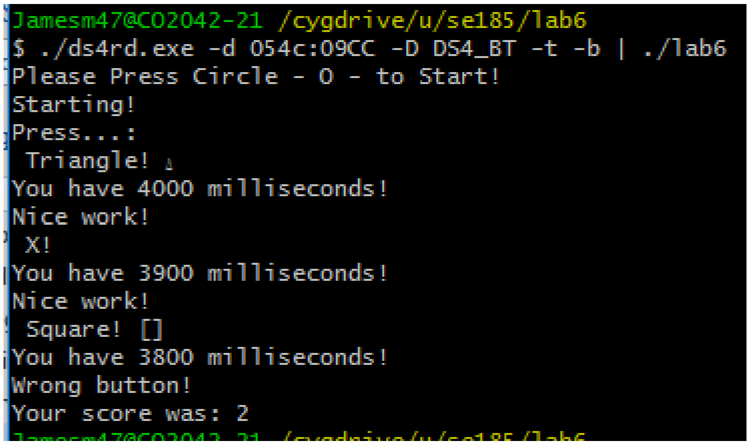
```
if(t - tDif1 < rt){

    if(tR2 == 0){

        tDif1 = t;
        tR2 = 1;

    }

    if(t - tDif1 > 250){
        if(b2 == 1){

            if(check4 == 0){
                printf("Nice work!\n");

                check4 = 1;
            }

            points++;

            rt = rt - 100;

            check3 == 0;

            rng = 0;

        }else if(b1 == 1){

            printf("Wrong button!\n");

            printf("Your score was: %d", points);

            win = 0;

        }else if(b3 == 1){

            printf("Wrong button!\n");

            printf("Your score was: %d", points);

            win = 0;

        }else if(b4 == 1){

            printf("Wrong button!\n");

            printf("Your score was: %d", points);

            win = 0;

        }
    }

}else{
```

```
                                          printf("Sorry, you took to long.
try again! \n");

                                          printf("Your score was: %d",
points);

                                          win = 0;

                                    }

                                    break;

                              case 4:


                                    if(check2 == 0){

                                          printf(" Triangle! △ \n");
                                          printf("You have %d
milliseconds!\n", rt);

                                          check4 = 0;
                                          tR = 0;
                                          check2 = 1;
                                    }


                                    if(t - tDif1 < rt){

                                          if(tR2 == 0){

                                                tDif1 = t;
                                                tR2 = 1;

                                          }

                                          if(t - tDif1 > 250){

                                                if(b1 == 1){

                                                      if(check4 == 0){
                                                            printf("Nice
work!\n");

                                                            check4 = 1;
                                                      }
                                                      points++;

                                                      rt = rt - 100;

                                                      check3 == 0;

                                                            rng = 0;

                                                }else if(b2 == 1){

                                                      printf("Wrong button!
\n");
```

```
                                    printf("Your score was:
%d", points);
                                    win = 0;
                                }else if(b3 == 1){
                                    printf("Wrong button!
\n");
                                    printf("Your score was:
%d", points);
                                    win = 0;
                                }else if(b4 == 1){
                                    printf("Wrong button!
\n");
                                    printf("Your score was:
%d", points);
                                    win = 0;
                                }
                            }
                        }else{
                            printf("Sorry, you took to long.
try again! \n");
                            printf("Your score was: %d",
points);
                            win = 0;
                        }
                        break;
                }
            }
        }
    }
    return 0;
}
int startB(int b){
    if(b == 1){
        return 1;
    }else {
        return 0;
        }
}
```

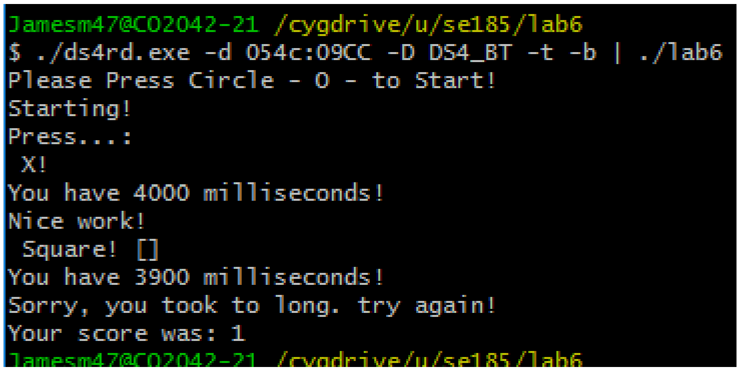
Screen Shots

Here is it with a wrong button input



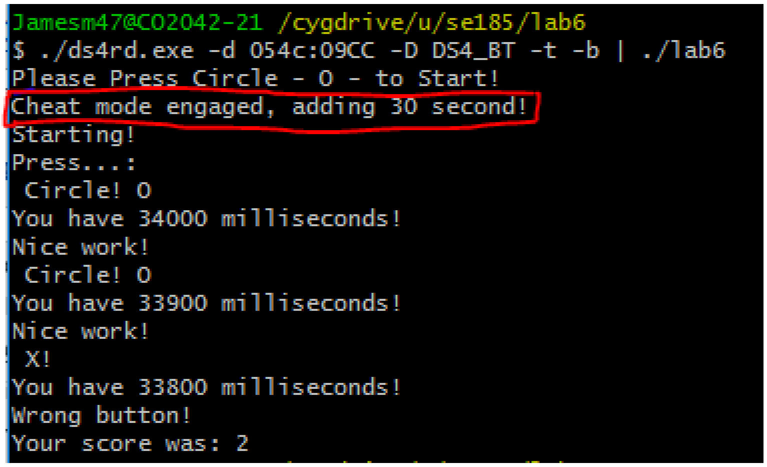
```
Jamesm47@CO2042-21 /cygdrive/u/se185/lab6
$ ./ds4rd.exe -d 054c:09CC -D DS4_BT -t -b | ./lab6
Please Press Circle - O - to Start!
Starting!
Press...:
 Triangle! ▵
You have 4000 milliseconds!
Nice work!
 X!
You have 3900 milliseconds!
Nice work!
 Square! []
You have 3800 milliseconds!
Wrong button!
Your score was: 2
Jamesm47@CO2042-21 /cygdrive/u/se185/lab6
```

Here it is timing out



```
Jamesm47@CO2042-21 /cygdrive/u/se185/lab6
$ ./ds4rd.exe -d 054c:09CC -D DS4_BT -t -b | ./lab6
Please Press Circle - O - to Start!
Starting!
Press...:
 X!
You have 4000 milliseconds!
Nice work!
 Square! []
You have 3900 milliseconds!
Sorry, you took to long. try again!
Your score was: 1
Jamesm47@CO2042-21 /cygdrive/u/se185/lab6
```

Here is my fun Easter egg. You hit Triangle and X before you start with Circle for this one.



```
Jamesm47@CO2042-21 /cygdrive/u/se185/lab6
$ ./ds4rd.exe -d 054c:09CC -D DS4_BT -t -b | ./lab6
Please Press Circle - O - to Start!
Cheat mode engaged, adding 30 second!
Starting!
Press...:
 Circle! O
You have 34000 milliseconds!
Nice work!
 Circle! O
You have 33900 milliseconds!
Nice work!
 X!
You have 33800 milliseconds!
Wrong button!
Your score was: 2
```