



Dungeon Solver

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Maximum Rizk

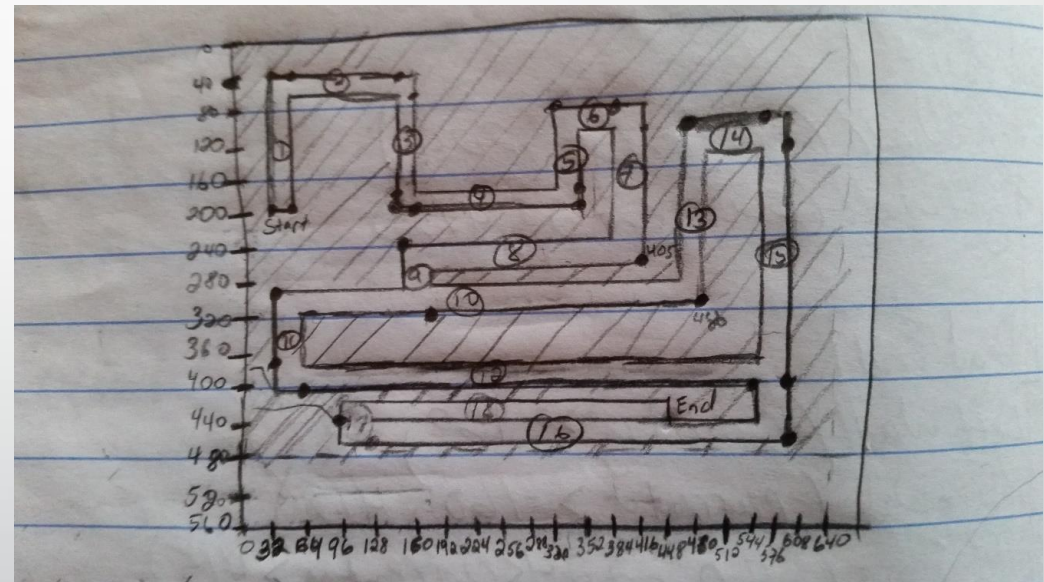
Vitaliy Vorobets

Project Objectives

- Create a Maze and User plays the game and solves it
- Timer Bar
- Trial Bar
- Collision
- Score

Maze Planning

- Used Pong as the basis to draw the maze
 - X-Range is 123-527
 - Y-Range is 53-427
- First constructed the maze and then added thickness to the lines of the maze



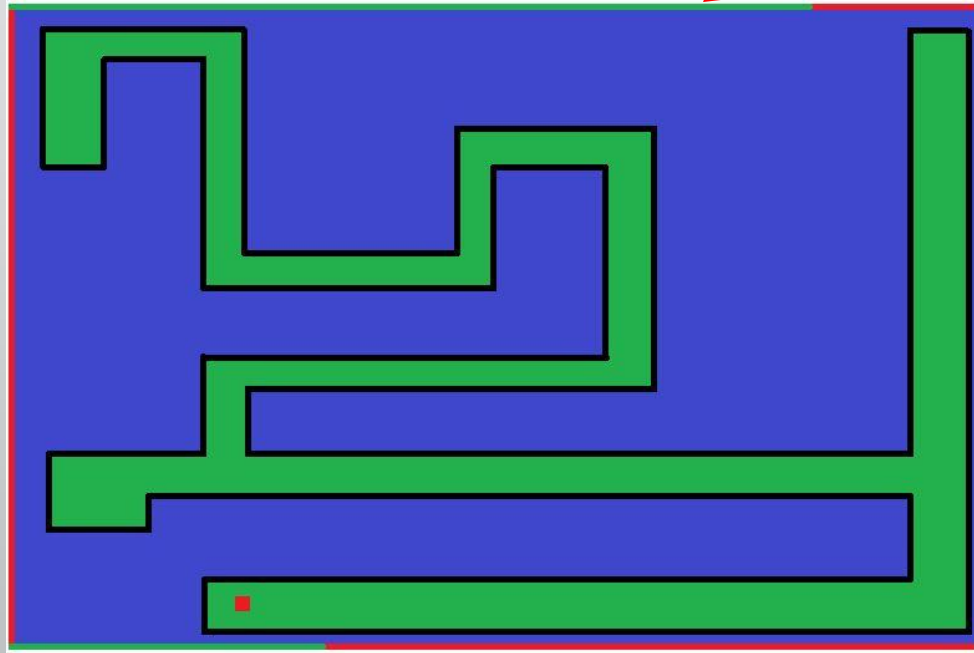
Maze Construction

```
...  
if(current_y > x"3F" and current_y <= x"8F" and current_x >= x"7E" and current_x <= x"81") then  
--vertical 7f/3f  
    colorOut <= GREEN;  
end if;  
if(current_y > x"3F" and current_y <= x"8F" and current_x >= x"7E" and current_x <= x"81") then  
--vertical 7f/3f  
    colorOut <= GREEN;  
end if;  
if(current_y > x"3F" and current_y <= x"8F" and current_x >= x"7E" and current_x <= x"81") then  
--vertical 7f/3f  
    colorOut <= GREEN;  
end if;  
...
```



Timer and Trial

Count Down Timer



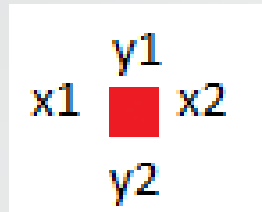
Trials

- The timer has approximately 50 second countdown
- Every time the timer counts down to '0', the trial bar is reduced
- The user gets 3 tries in total after which the game will end

Timer and Trial Code

```
Count: process(clk, rst)
begin
    if(rst='1')then
        counterSec <= (others=> '0');
        top_time <= timer_trial;
        trial <= timer_trial;
    elsif(clk'event and clk = '1') then
        counterSec <= counterSec +'1';
        if(counterSec =
"oooooooooooooooooooooooooooo") then
            top_time <= top_time - x"008";
            if(top_time = x"7B") then
                top_time <= timer_trial;
                trial <= trial-x"87";
            end if;
        end if;
    end if;
end if;
end process;
```

Collisions Explained



- Different parts of the maze have different restrictions
- As the player moves from one part to the other its 'state' changes
- With the change in state, its boundary restriction changes

Collision Code

```
if(hallway= "00000") then
    if(btnL = '1' and bottom_player_x1 >= x"EA") then
        bottom_player_x1 <= bottom_player_x1 - '1';
    elseif(btnR = '1') then
        bottom_player_x1 <= bottom_player_x1 + '1';
    end if;
    if(btnD = '1' and bottom_player_y2 <= x"1A5") then
        bottom_player_y1 <= bottom_player_y1 + '1';
    elseif(btnU = '1' and bottom_player_y1 >= x"199") then
        bottom_player_y1 <= bottom_player_y1 - '1';
    end if;
    if(bottom_player_x1 >= x"1F4") then
        hallway <= "00001";
    end if;
end if;
```