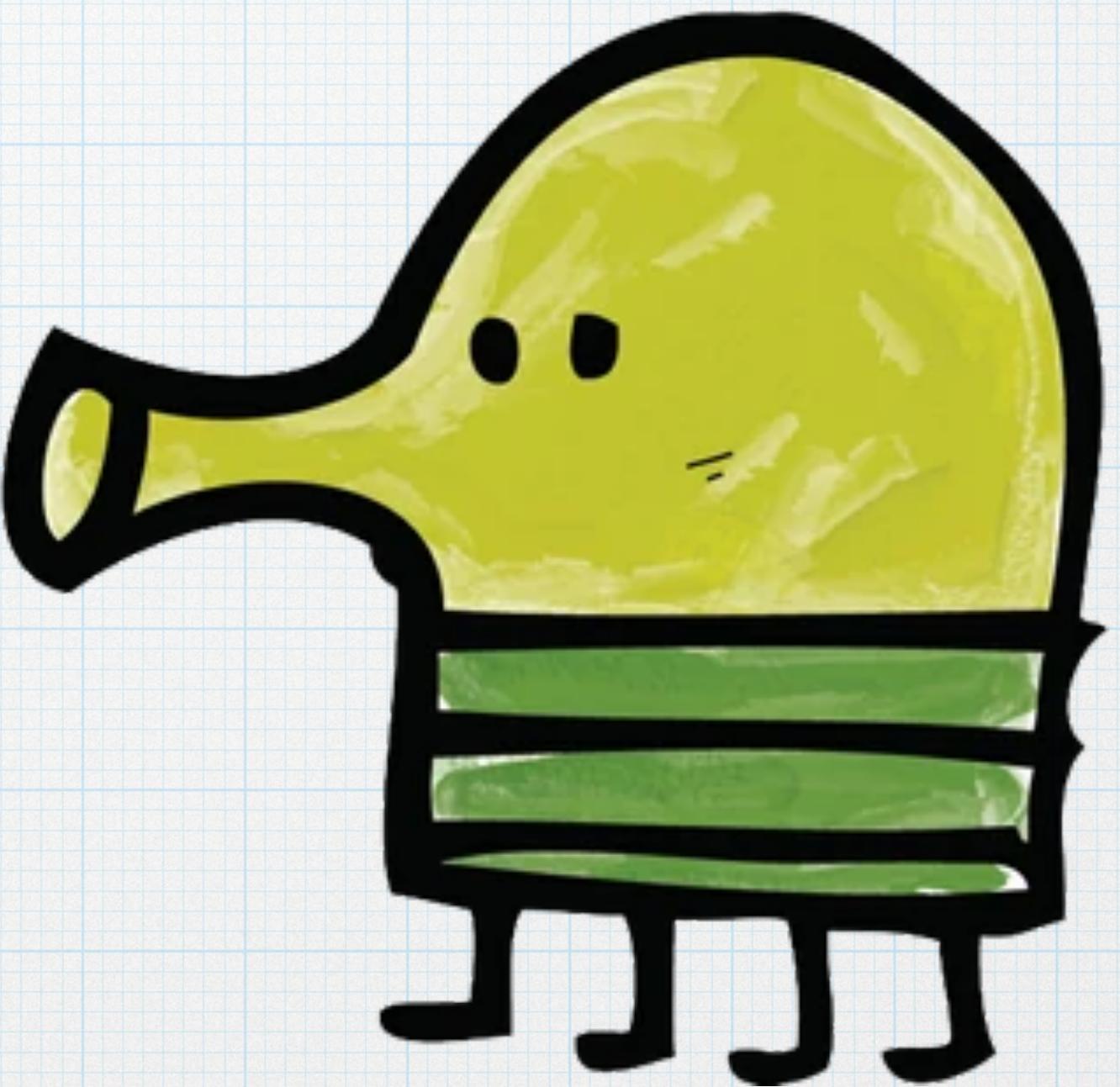


數位系統設計實習期末專案

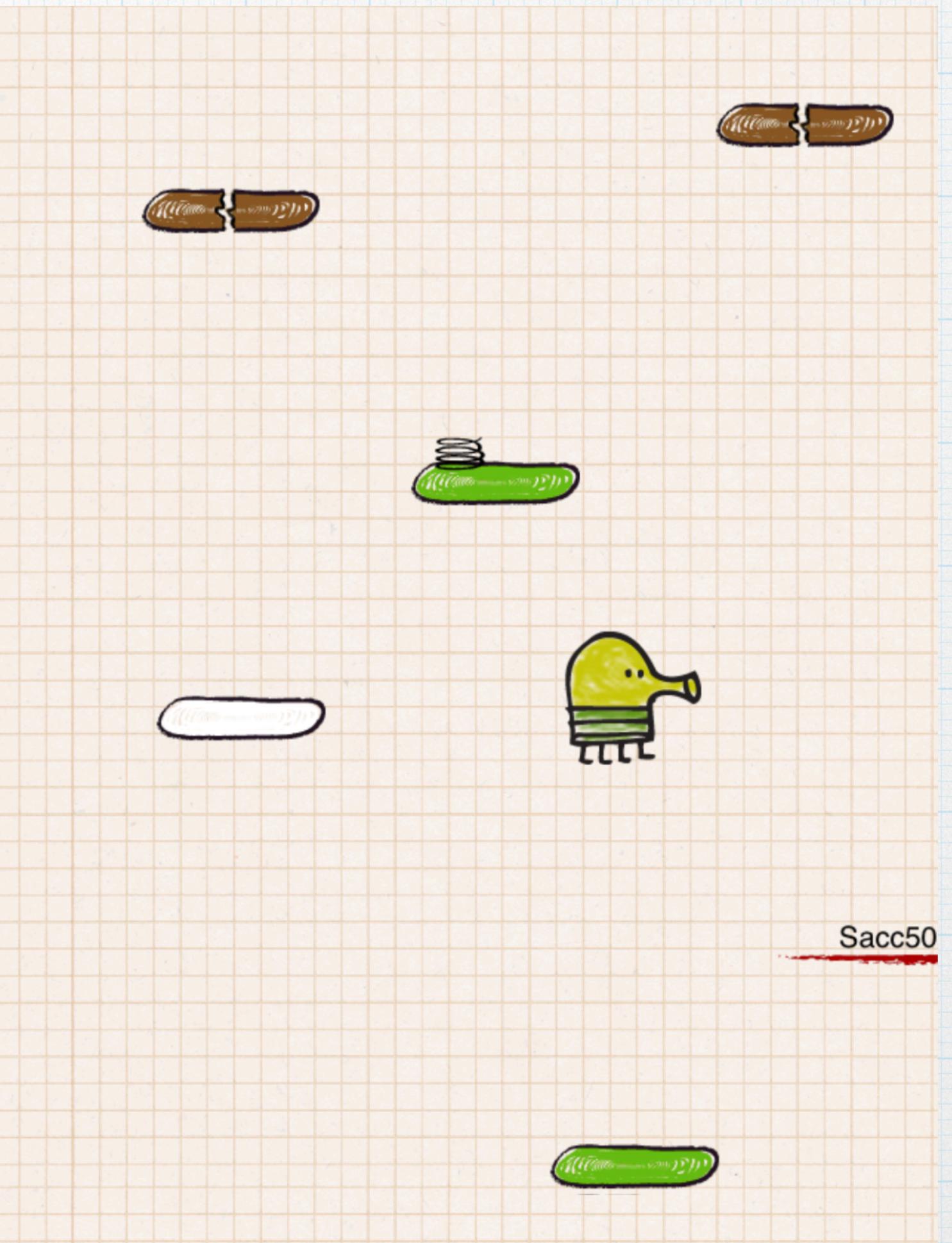
Doodle jump

B11107048 李勁磊



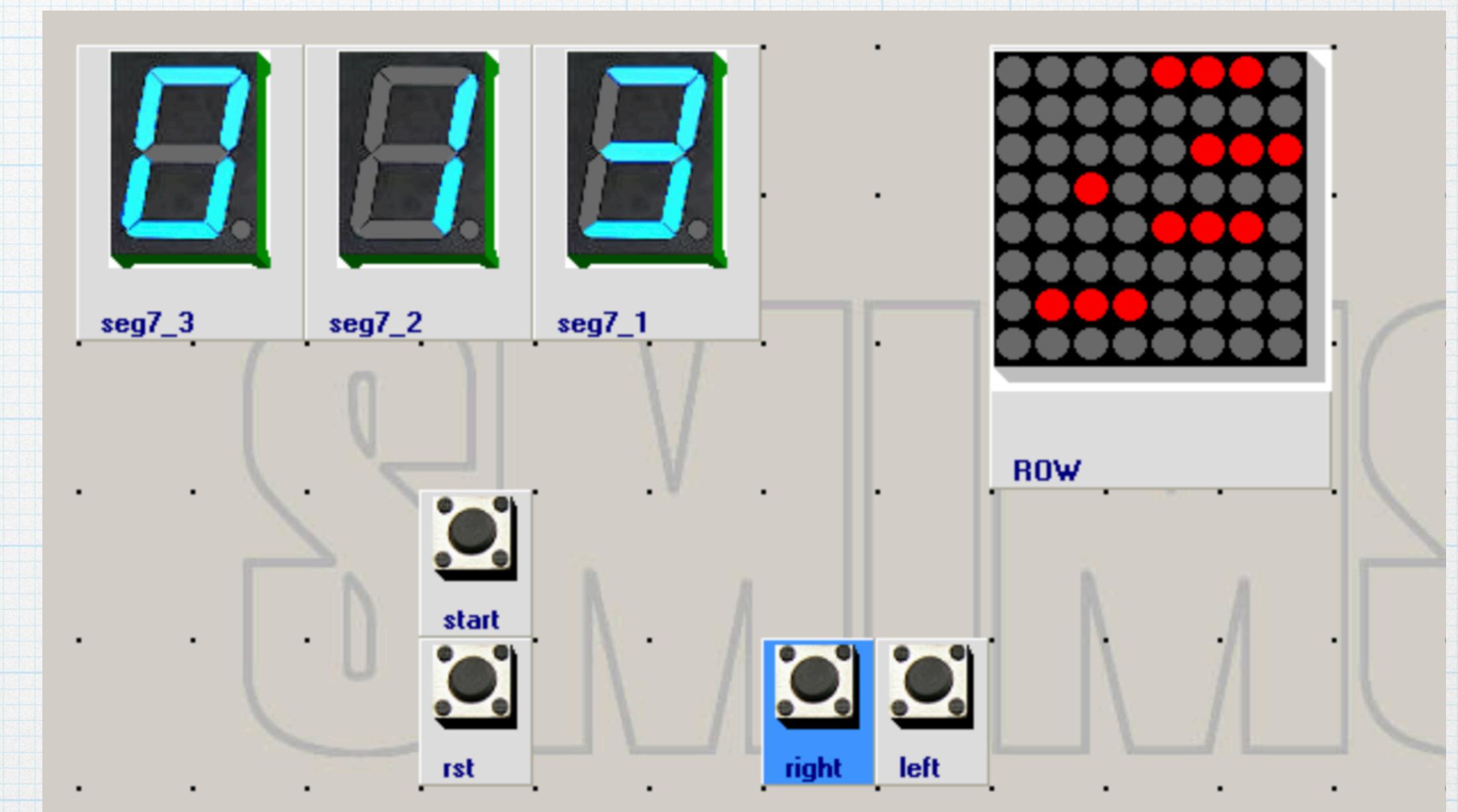
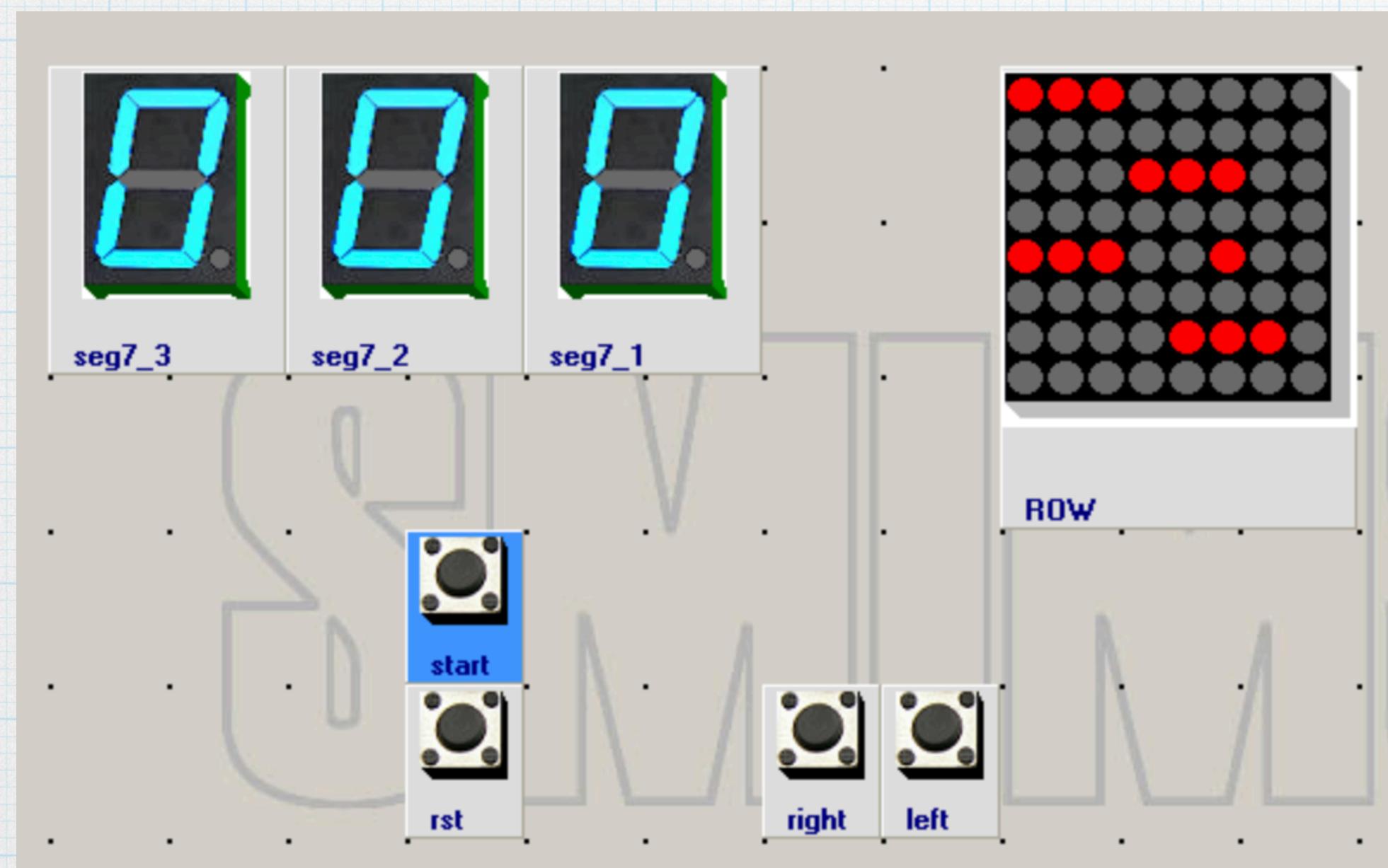
# How to play?

- \* 遊戲中人物會一直上下跳動
- \* 操作者要利用上下跳的空檔操控左右鍵，讓人物跳上一個台階
- \* 有閃爍的台階是一次性的，踩過一次之後就會消失，沒有閃爍的是穩定的方塊不會消失，也有些方塊會左右移動
- \* 閃爍方塊出現的機率會隨分數的增加而增加



illustrative Video

# Actual Execution



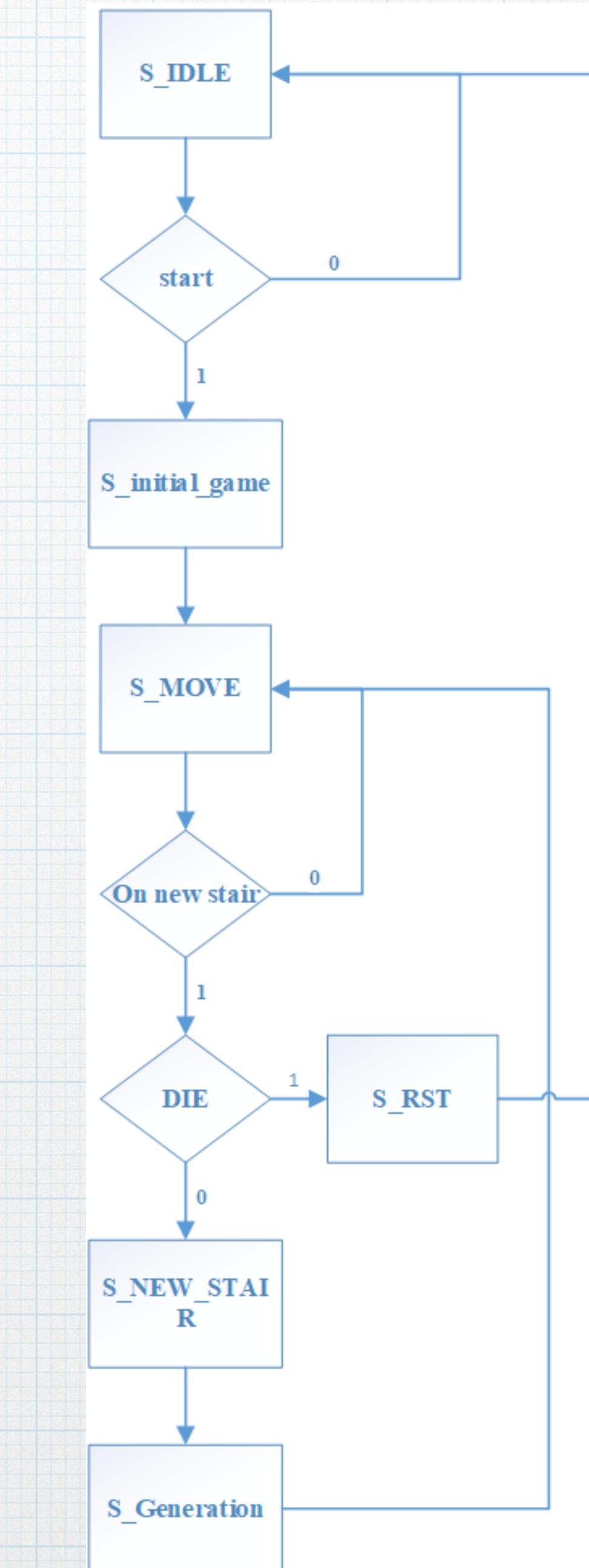
# Demonstration Video

# Finite State Machine Chart

```

case(state)
  S_IDLE: begin
    if(start == 1) begin
      next_state = S_INITIAL_GAME;
    end
    else begin
      next_state = S_IDLE;
    end
  end
  S_INITIAL_GAME: begin
    next_state = S_MOVE;
  end
  S_GENERATE: begin
    if(generate_fg != 0) begin
      next_state = S_GENERATE;
    end
    else begin
      next_state = S_MOVE;
    end
  end
  S_MOVE: begin
    next_state = S_MOVE_2;
  end
  S_MOVE_2: begin
    if(end_game == 1) begin
      state = S_RST;
      next_state = S_IDLE;
    end
    else if(move_finish == 1) begin
      next_state = S_NEW_STAIR;
    end
    else begin
      next_state = S_MOVE;
    end
  end
  S_NEW_STAIR: begin
    next_state = S_GENERATE;
  end
end
endcase

```



# Learning from the project

- \* 在真正製作遊戲時才會知道很多程式的細節，像是哪裡要用 `<=` 還是 `=`，我debug了很久。很多時候程式寫完後覺得已經在腦中完美執行的，結果到燒入時才發現完全和想的不一樣。因為我是用FSM寫，所以有些時候會在不對的時候進到不對的state，不然就是輸出訊號沒有讀到，為了找出這些問題我花了很多時間，最後利用ModelSim找出來那些隱藏的bug。
- \* 在實際製作遊戲後我對FSM更了解了，也實際畫過FSM chart，要不然之前實習都是矇矇懂懂，有波形就好，親自做過後才知道裡面的門道。