# Mini Project - Tetris

Grupp members : Duosi Dai, Ruimin Ma

1. Objective and Requirement

**Objective :** The objective of the game is to move and rotate falling geometric shapes to form complete rows at the bottom of the game board.

**Basic Requirement (main):**

* + - Display game on built-in OLED graphical display.
    - Blocks of different shapes fall from the top of the screen to the bottom of the screen and remain there.
    - When a row is completed , it disappears ,and blocks above shifts downwards to fill the space.
    - Detect when the player loses (e.g., screen fills up completely with blocks) and print score (number of rows completed).

1. Solution

* Blocks
  1. 7 different shapes if they are able to rotate 90 grad 4 times
* Board (2D)
  1. Board :128 x 32
  2. Show the current block
  3. show the next block
  4. Save the previous blocks
  5. Print some sentences ,for example “Game Over” , “ NEXT” ,”POINT”
  6. Show the scores
* Actions
  1. Be able to move in the x - axis and y - axis(falling)

(move left , move right)

* 1. Not move out of the board (wallcheck)
  2. When the block can not move in the x- or y- axis any more
     1. full row -----> clear the row
     2. not full row ----> touch the top ----> game over

----> do not touch the top ----> continue

d. Rotation when the player presses the button BTN1

* Random
  1. The shape of the currently falling piece
  2. A supply of random pieces

1. Verification

When we finish one part of the game, test by compiling and running the codes.

Test the game by playing it.

| Name | Function | Verification |
| --- | --- | --- |
|  | 1. Create 7 blocks which can rotate | x |
| createShapes(shapes.c) | 1. Random shape of the currently falling piece 2. Define which blocks shape contains | x |
| drawNextShape(shapes.c) | 1. Draw next shape | x |
| drawFallenblocks(shapes.c) | 1. Draw the fallen blocks on the bottom of gamefield | x |
| breakLine(shapes.c) | 1. Clear the full row | x |
| downFaster (shapes.c) | 1. Make block go one step down | x |
| moveLeft (shapes.c) | 1. Move left | x |
| moveRight (shapes.c) | 1. Move right | x |
| rotate (shapes.c) | 1. Press the BTN1 to rotate | x |
| wallcheck (shapes.c) | 1. Check against the left and right wall | x |
| drawPixel (func.c) | 1. Draw pixel | x |
| drawNumber (func.c) | 1. Draw number | x |
| drawScore (func.c) | 1. Use the number in the drawNumber to draw the score | x |
| drawBorder (func.c) | 1. Draw the game border | x |
| drawGameText (func.c) | 1. Draw the game pixel by pixel | x |
| drawBlock (func.c) | 1. Draw a 3x3 block on the grid | x |
| getbtns (inputs.c) | 1. Choose which button to use for moving left, right and down . | x |
| gameover ( tetris.c) | 1. Display all the text and scores 2. Wait 5s and return to the menu | x |
| game (tetris.c) | 1. Connect the game with getbtns | x |
| menu (tetris.c) | 1. start menu ( basic information ) | x |