Tetris

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專案架構

01

前端

由html、javascript、css三檔組成

02

後端node.js

用express架構來處理寫入跟輸出的處理

03

JSON

處存排行榜結果

程式主要四大類

01

遊戲邏輯

Tetris主要的遊戲流程。

02

排行榜

負責從tetris server json檔案讀取資料及輸出資料

03

音效與音樂

背景音樂及按鍵音效

04

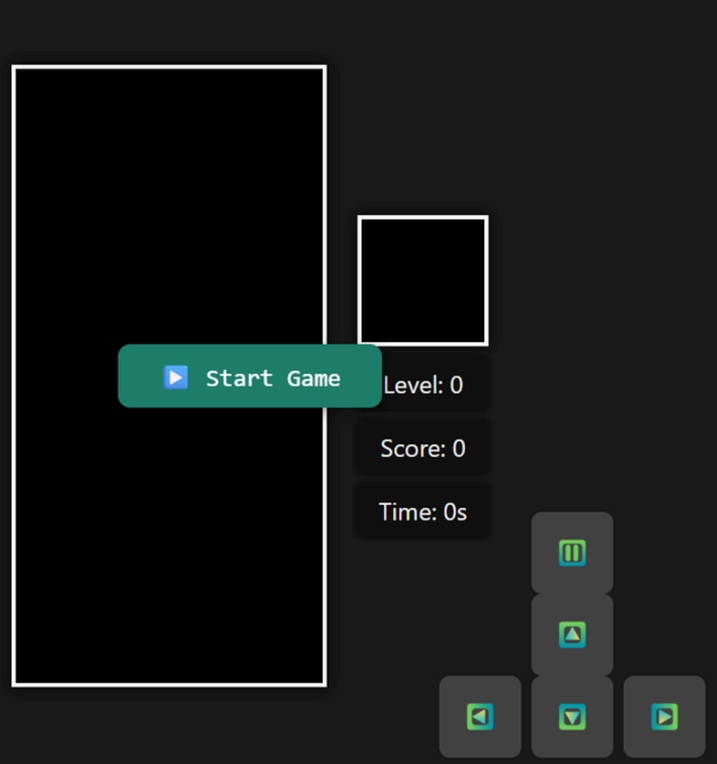
鍵盤與按鍵

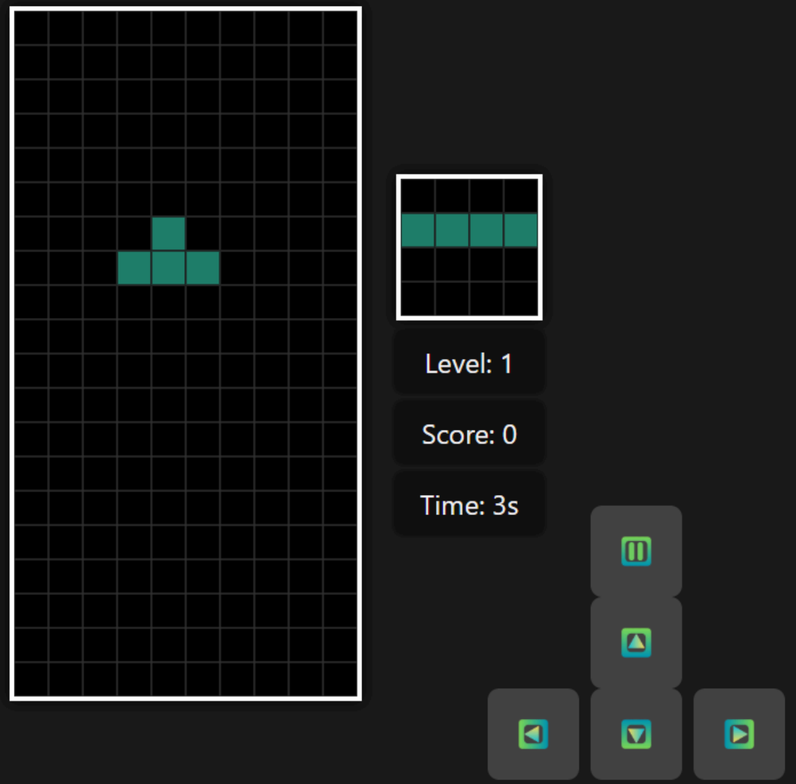
操控方塊的按鍵及暫停鍵

Start()

從startbutton按下後
先畫背景格線
再畫下一個方塊的預覽
進入update()主程式

```
318  function start() {
319      context.fillStyle = "#000";
320      context.fillRect(0, 0, COLS, ROWS);
321      drawGrid();
322      drawGridsmall();
323      drawShapesmall(nextShape, 0, 0, "#1F7F6C");
324      gameLoop = setInterval(update, 500);
325  }
```





update()

是否到底判定

遊戲結束判定

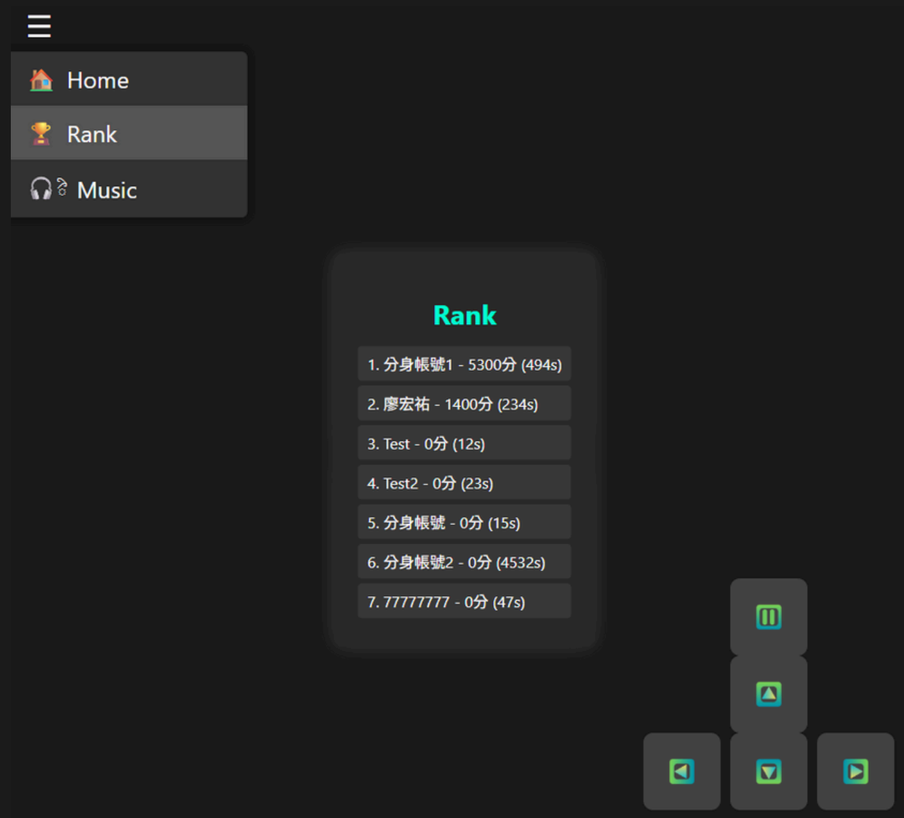
重新畫
Block、Grid

分數時間更新
判斷是否升級

```
281  function update() {
282      if(!paused){
283          if (!collision(currentShape, posX, posY + 1)) posY++;
284          else {
285              merge(currentShape, posX, posY);
286              clearLines();
287              currentShape = nextShape;
288              nextShape = randomShape();
289              drawShapesmall(nextShape, 0, 0, "#1F7F6C");
290              posX = 3;
291              posY = 0;
292              if (collision(currentShape, posX, posY)) {
293                const elapsedTime = Math.floor((Date.now() - startTime) / 1000);
294                playSound("gameover");
295                document.getElementById("gameOverPanel").classList.remove("hidden");
296                clearInterval(gameLoop);
297
298              }
299          }
300
301
302          context.fillStyle = "#000";
303          context.fillRect(0, 0, COLS, ROWS);
304          drawGrid();
305          for (let y = 0; y < ROWS; y++) {
306              for (let x = 0; x < COLS; x++) {
307              if (board[y][x]) drawBlock(x, y, "#1F7F6C");
308              }
309          }
310          drawShape(currentShape, posX, posY, "#1F7F6C");
311          document.getElementById("scoreDisplay").textContent = `Score: ${score}`;
312          const elapsedTime = Math.floor((Date.now() - startTime) / 1000);
313          document.getElementById("timerDisplay").textContent = `Time: ${elapsedTime}s`;
314          LevelUp();
315      }
316  }
```

saveScoreToRank()

從rank fetch資料




```
453  function saveScoreToRank(score, time, name) {
454    const isValid = /^[\u4e00-\u9fa5a-zA-Z0-9_]{1,15}$/.test(name);
455    if (!isValid) {
456      alert("⚠ 名字不合法！請使用中英文、數字或底線，最多15字");
457      return;
458    }
459
460
461    fetch('http://140.113.65.41:3000/rank')
462      .then(res => res.json())
463      .then(data => {
464        const nameExists = data.some(entry => entry.name === name);
465        if (nameExists) {
466          alert("此名字已經存在排行榜中，請換一個！");
467          return;
468        }
469
470        return fetch('http://140.113.65.41:3000/rank', {
471          method: 'POST',
472          headers: {
473            'Content-Type': 'application/json'
474          },
475          body: JSON.stringify({ name, score, time })
476        });
477      })
478      .then(res => res?.json?.())
479      .then(data => {
480        if (data) {
481          console.log("儲存成功", data);
482
483          gameElements.forEach(el => el.style.display = "none");
484          document.getElementById("gameOverPanel").classList.add("hidden");
485          showRank();
486          rankPanel.classList.remove("hidden");
487
488          setTimeout(() => {
```

showRank()

從rank fetch資料

```
328  function showRank() {
329    fetch('http://140.113.65.41:3000/rank')
330      .then(res => res.json())
331      .then(rankData => {
332        const rankList = document.getElementById("rankList");
333        rankList.innerHTML = "";
334        rankData.forEach((entry, index) => {
335          const li = document.createElement("li");
336          li.textContent = `${index + 1}. ${entry.name} - ${entry.score}分 (${entry.time}s)`
337          rankList.appendChild(li);
338        });
339      });
340  }
```

Node.js server

用express架構
require()

```
const express = require('express');
const fs = require('fs');
const cors = require('cors');
const bodyParser = require('body-parser');
const path = require('path');

const app = express();
const PORT = 3000;

app.use(cors());
app.use(bodyParser.json());

app.use(express.static(path.join(__dirname, 'public')));

// 排行榜 API
app.get('/rank', (req, res) => {
  const data = JSON.parse(fs.readFileSync('rank.json'));
  const top10 = data.sort((a, b) => b.score - a.score).slice(0, 10);
  res.json(top10);
});

app.post('/rank', (req, res) => {
  try {
    const newEntry = req.body;
    console.log("收到資料：", newEntry);

    const data = JSON.parse(fs.readFileSync('rank.json'));
    data.push(newEntry);
    fs.writeFileSync('rank.json', JSON.stringify(data, null, 2));
    res.status(201).json({ message: '儲存成功', entry: newEntry });
  } catch (err) {
    console.error("儲存失敗：", err);
    res.status(500).json({ message: '儲存失敗', error: err.message });
  }
});
```

排前10回傳
res.json(top10)

從網頁取得資料儲存

```
app.get('/', (req, res) => {
  res.sendFile(path.join(__dirname, 'public', 'index.html'));
});
app.use((req, res, next) => {
  console.log(`💡 收到請求：${req.method} ${req.url}`);
  next();
});
```

讓請求能夠繼續

http://140.113.65.41:3000/

The end