**PROJECT**

**DOCUMENTATION**

CYBERTETRIS

QUALITY IMPROVEMENT

PROJECT DOCUMENTATION

PROJECT MANAGER: 吕炎明

PROJECT DATE: 2021/5/12 ~ 2021/6/16

VERSION 3.0

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| **DEVELOPED BY** | 吕炎明，刘慧杰，刘宇轩，张滢 | **TITLE** | CYBERTETRIS | **DATE** | 6/16 |

| VERSION | REVISION DATE | DESCRIPTION OF CHANGE | AUTHOR |
| --- | --- | --- | --- |
| 1.0 | 5/19 | Basic game implement  UI implement | 吕炎明，刘慧杰，刘宇轩，张滢 |
| 2.0 | 6/2 | Game shopping system  Account system and database built  Multiple models of game  Game save and load | 吕炎明，刘慧杰，刘宇轩，张滢 |
| 3.0 | 6/16 | Network play  Animation implementation  Music and sound | 吕炎明，刘慧杰，刘宇轩，张滢 |

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# Game introduction

## Background

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| A project for produced by Lv Yanming, Liu Huijie, Liu Yuxuan and Zhang Ying using data structure. And it is a C++ implementation of Tetris Game. |

* 1. Project technology implementation

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| Basic:   * Object-oriented programming techniques: class, object, etc. * The exception handling * The input / output stream * Collection * The multithread technology * The graphical user interfaces   Extra:   * The TCP/IP or UDP client and server network programming technology * The Sqlite database. * The animation implemented by QPropertyAnimation. |

# Outline design

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| In Tetris, players complete lines by moving differently shaped pieces (tetrominoes), which descend onto the playing field. The completed lines disappear and grant the player points, and the player can proceed to fill the vacated spaces. The game ends when the playing field is filled. |

# ESTABLISH GOALS AND TIMELINES(Detailed design)

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| **GOAL** | **PROJECT DEVELOPMENT DETAILS** | **GOAL IMPLEMENTATION DATE** |
| Basic game structure | Basic game data structure implement.  Using QTimer to start the game circle. | 5/12~5/19 by 吕炎明,刘慧杰 |
| Game functions | Game over judgement, and full lines judgement. | 5/12~5/19 by 刘宇轩 |
| Basic GUI | UI design and beautify. | 5/12~5/19 by 张滢 |
| Game shopping system | Add skins of tetris and game props. | 5/20~6/2 by 吕炎明 |
| Account system and database | Connect account information to the sqlite database. | 5/20~6/2 by 刘慧杰 |
| Multiple game modes | Achieve normal mode, time mode, and target lines mode. | 5/20~6/2 by 刘宇轩 |
| GUI implementation | Add pictures to the GUI, and improve Interface layout. | 5/20~6/2 by 张滢 |
| Music | Add music and sound effects to the game. | 6/3~6/16 by 吕炎明 |
| Visual animation | Add animations to the game. | 6/3~6/16 by 刘慧杰 |
| Online gaming | Implement online game using TCP/IP. | 6/3~6/16 by 刘宇轩 |
| GUI implementation | Continue to beautify the interface, and improve interface switching. | 6/3~6/16 by 张滢 |

# PROCESS FLOWCHART

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# System manual

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| Enter window:    Log in:    Gaming:    Online mode:    Shopping system: |

# Collaborative development

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| Using Github open source platform as the code warehouse hosting platform. Because the use of git is very flexible, many different workflows have been derived in practice, and different projects and different teams will have different collaboration methods. |

# Data structure

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| * Create a Shape structure to store the current structure and provide a method of square rotation.The Shapes array is used to store the shapes of various squares. * class Game is the bottom logic part of the game, which controls the operation of the game and saves various game parameters. * class MainWindow inherited from QMainWindow, used for game screen display, for human-computer interaction, and set up keyboard listeners. * class Start inherited from QMainWindow, used to display the login interface, to select the game mode, and to change the skin. * class Store inherited from QMainWindow and used to display the game store interface. * Using stack to store tetrominoes. |

# UML

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| C:\Users\16271\AppData\Local\Temp\WeChat Files\e22f2b3ac018fe0189053e84bee5208.png |

# Summary and evaluation

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| * At the beginning of the project, the team members discussed the requirements in detail and clarified our goals. Although the coding time was compressed, the results proved that the investment in the requirements phase was necessary. * In project development, the team members did not put most of their energy into coding, but on requirements and design, so that they had a clear idea of ​​the implementation before coding, making the coding process easier. * During the whole project process, the change of requirements was better controlled, so that the final realization process did not undergo major changes due to the change of requirements. * Before coding, the division of each module and the interface definition work were completed carefully, so that the team members realized the parallel work well, and did not encounter too much trouble during the integration. * Timely record the problems and solutions encountered during the development process, which is of great help to the maintenance and improvement of the later system. |