Assignment
Stage One Submission
2805ICT/3815ICT/7805ICT

Group Number: __12___

Student name:__Vy Dang___ Student ID:__s5245519__ Enrolled Course Code: __3815ICT___

Table of Contents

1.0 Project Planning and Documentation

1.1 Time Schedule

This table should reflect who did what, how long you expected sections to take and the actual hours it took to perform the tasks.

Task		Plan				Actual		
#	Task Name	Student	Planed Time	Cumulative Time	Finished Date	Time	Cumulative Time	Finished Date
1	Project plan	Vy Dang	0.5 hours	0.5 hour	25/08/2023	0.25 hour	0.25 hour	25/08/2023
2	Identify Functional Requirement	Vy Dang	2 hours	2.5 hours	15/08/2023	2 hours	2.25 hours	15/08/2023
3	Identify non-functional requirements	Vy Dang	2 hours	4.5 hours	15/08/2023	2 hours	4.25 hours	15/08/2023
4	Draw use case diagram	Vy Dang	2 hours	6.5 hours	15/08/2023	1.5 hours	5.57 hours	15/08/2023
5	Write a full use case description	Vy Dang	1.5 hours	8 hours	15/08/2023	1.25 hour	7 hours	15/08/2023
6	Draw an activity diagram	Vy Dang	1.5 hours	9.5 hours	15/08/2023	3 hours	10 hours	25/08/2023
7	Write code for the game	Vy Dang	24 hours	33.5 hours	21/08/2023	20 hours	30 hours	22/08/2023
8	Record and upload video	Vy Dang	1 hour	34.5 hour	25/08/2023	1 hour	31 hours	25/08/2023

1.2 Total working hours

Student Name (#ID)	Plan (hours)	Actual (hours)
Vy Dang - S5245519	34.5	31
Total working hours	34.5	31
Average working hours per person	34.5	31

1.3 Effort and contribution table

Student	Effort Level* (Rating from 0 – 5, the information is filled by the group)	Contribution Level* (Rating from 0 – 5, the information is filled by the group)	Justification If a student received level rating of 3 or less, your group need to give explanation for the low level rating
Vy Dang	5	5	
Total	5	5	

- *Level ratings, 5 = excellent, 4 = good, 3 = reasonable, 2 = poor, 1 = unacceptable, 0 = none

1.4 Version Control System

[Your group needs to use a version control system (VCS) to manage the source code development. Please use screenshot to demonstrate that a suitable VCS system has been applied in developing this project.]

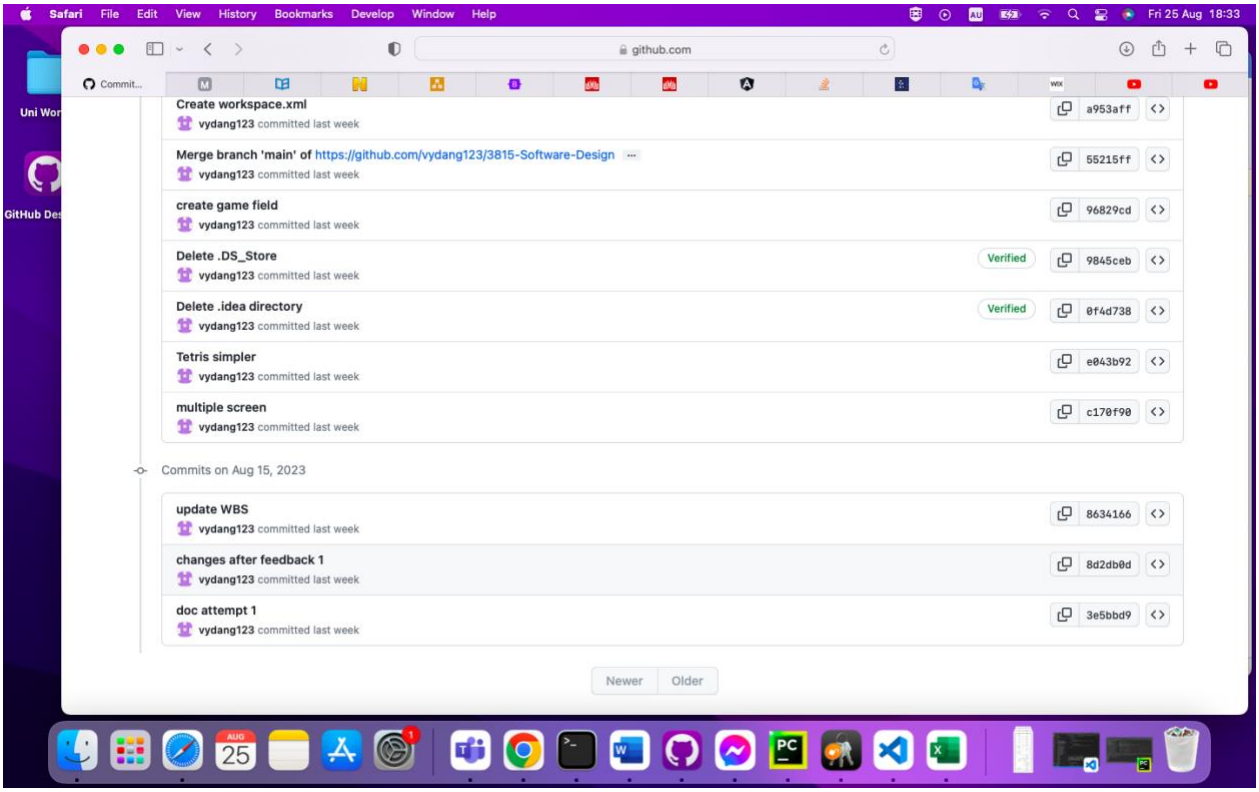


Figure 1: History of the work has been done and committed on GitHub from the beginning of the project to the end of phase 1 – part 1

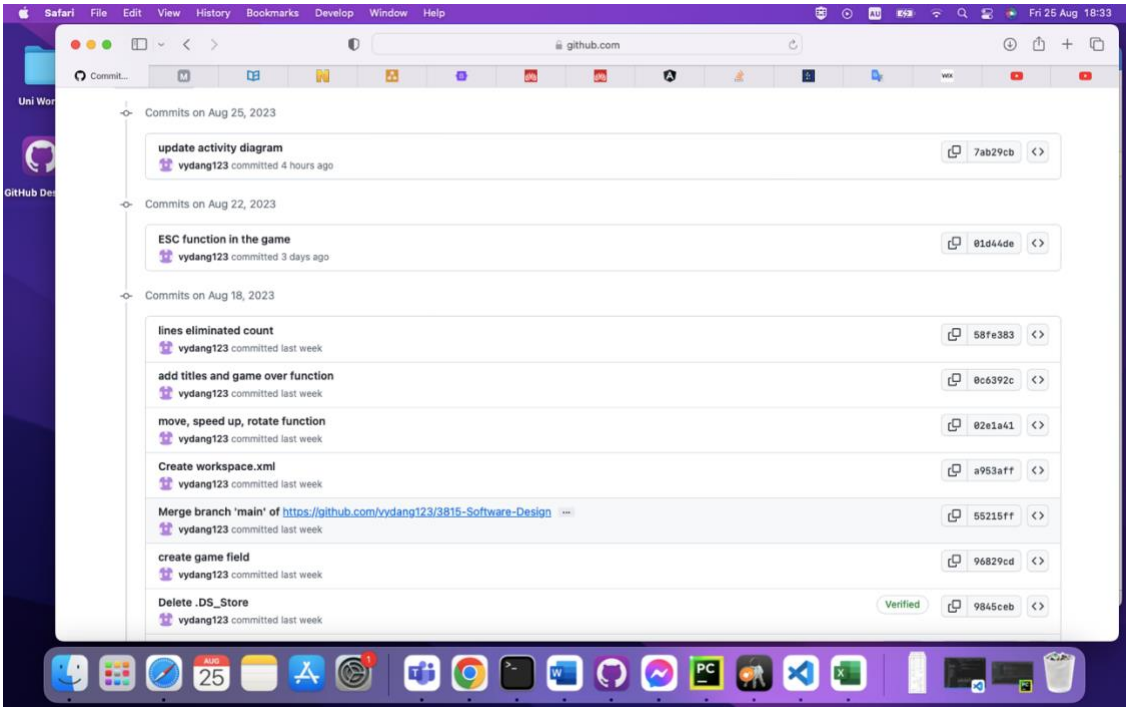


Figure 2: History of the work has been done and committed on GitHub from the beginning of the project to the end of phase 1 – part 2

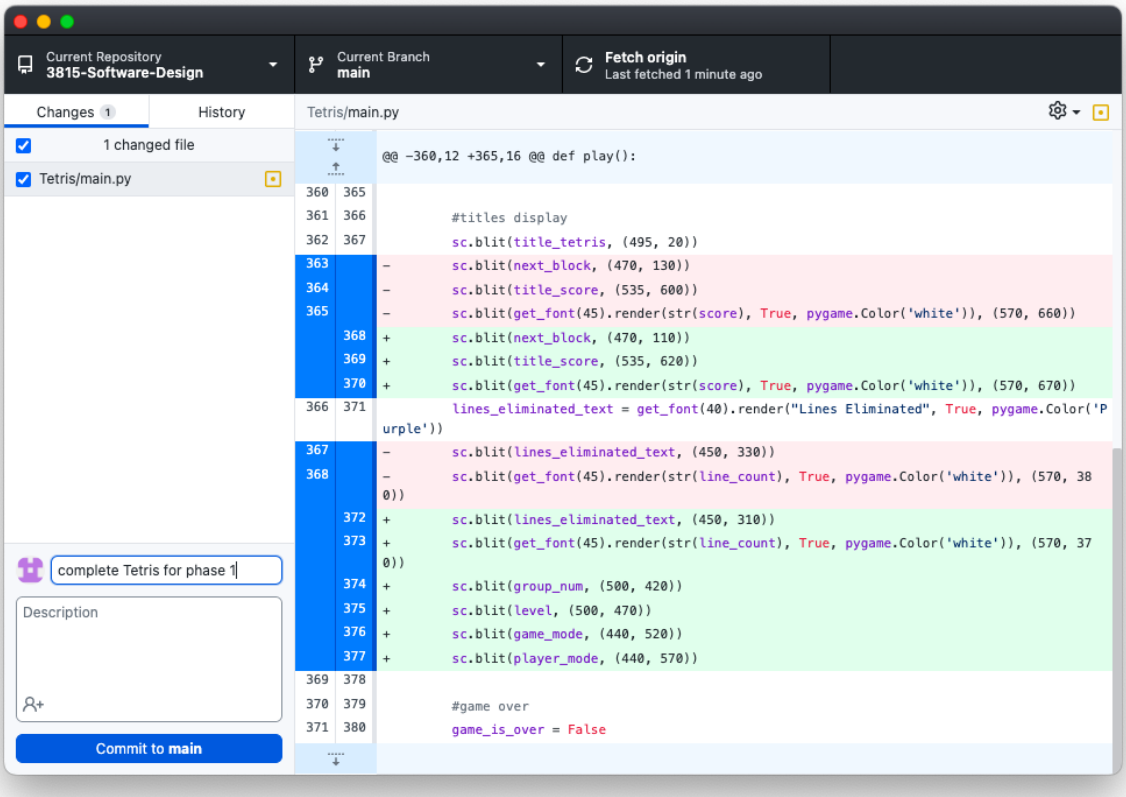


Figure 3: GitHub Desktop shows changes in modified file, name of these changes to commit to main

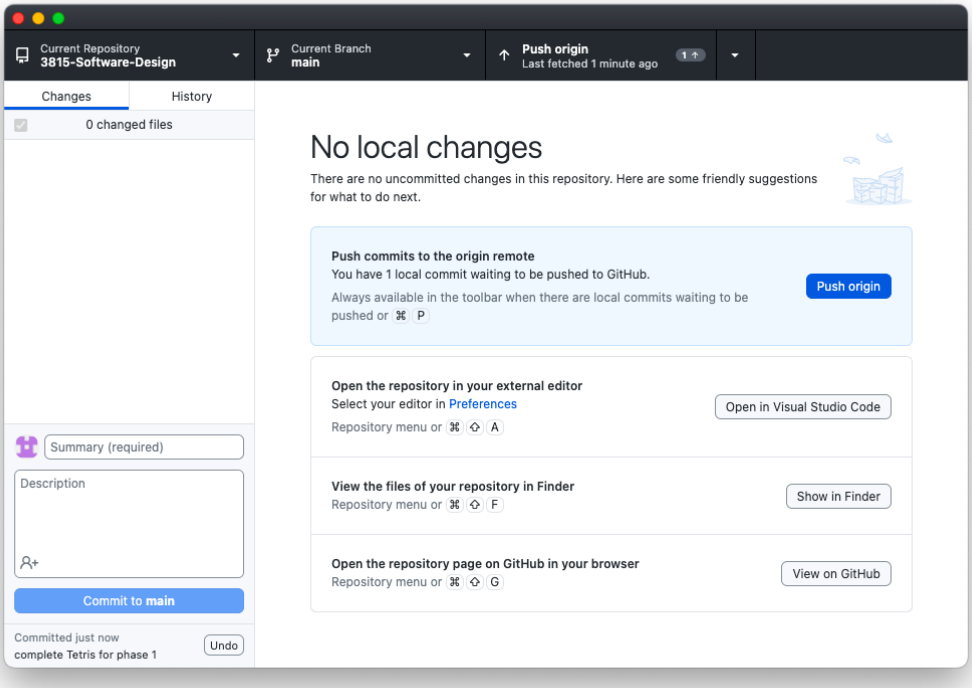


Figure 4: The modifies files will be updated on GitHub once “Push origin” button is clicked.

2.0 Requirements Analysis

2.1 Functional requirements

ID	Priority	Function	Description
FR01	1	Execute on different platforms	The system allows the game to be executed on at least two different platforms
FR02	1	Display a Start-up page	The system displays a Start-up page when a player launches the game
FR03	1	Introduce the game and display needed buttons in the Start-up Page	The Start-up Page displays the name of the game “Tetris”, the current year, the course code, and a list of all students in the group of the project. It should also demonstrate “Play”, “Configure”, “Score” and “Exit” buttons.
FR04	1	Close the game	The “Exit” button on the Start-up Page allows the player to close the game
FR05	1	Display top players	The “Score” button on the Start-up Page will show the top 10 players with their scores when clicked
FR06	1	Move to Configure Page	The “Configure” button on the Start-up Page allows the player to access the Configure Page

FR07	1	Transition to the game interface	The “Play” button on the Start-up Page takes the player to the game interface
FR08	3	Choose the mode of the game	In the “Configure Page”, the player is allowed to choose a normal game or game with an extension
FR09	3	Select size of the playing field	In the “Configure Page”, the size of the playing field, or the space in which the blocks move and stack, is another option available to the players
FR10	3	Modify the game level	In the “Configure Page”, the block-dropping speed, which is also known as game level, can be adjusted by the players
FR11	3	Choose the play mode	The player can choose the “Play as AI” option in the Configure Page.
FR12	1	Move blocks	While playing the game, the player can use the left arrow key to shift the falling block to the left, the right arrow key to shift the falling block to the right
FR13	1	Rotate the block	While playing the game, the player can use the up arrow key to rotate the block 90 degrees clockwise
FR14	1	Increase the block falling speed	While playing the game, the player can use the down arrow key to increase the block-falling speed
FR15	2	Pause the game	During the game, the player can press “P” to pause and resume the game
FR16	2	Conclude the game	During the game, the player can press the “esc” key, a dialog box is prompted and two options are available: “Yes” to return to the Start Page, “No” to keep playing the game
FR17	2	Toggle music and sound effects	While playing the game, the player can press “M” to toggle music and sound effects
FR18	1	Record points	During the game, points are earned by removing lines, and the number of lines eliminated in a single drop affects how many points players and AI receive (1 line = 100, 2 lines = 300, 3 lines = 600, 4 lines = 1000)
FR19	3	Add two types of blocks	In the “Configure Page”, if the player chooses the expanded game version, there will be two new block types with three squares each added to the game.
FR20	3	AI controls the game	In the “Configure Page”, if the player chooses to “Play as AI”, block movements and speed are controlled by the AI when the game is played.
FR21	1	Display game information	The main game page displays the game field, dropping blocks, accumulated blocks, group number, score, eliminated lines, level, game mode, and block shape.

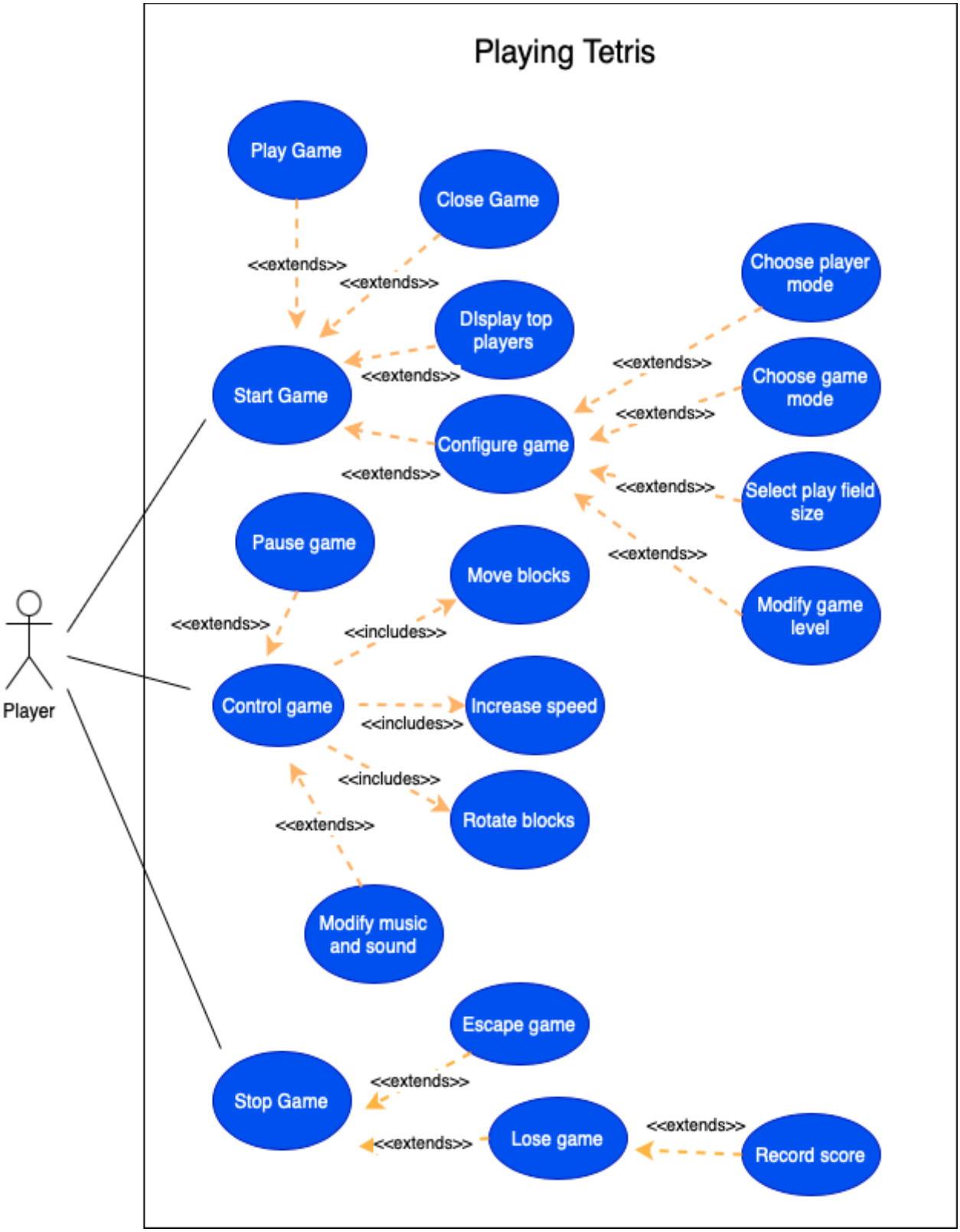
FR22	1	Lose the game	If the game field is filled with blocks, the game ends
FR23	2	Record top 10 scores	When the game is over, a dialog box where players can enter their names will appear if their scores rank in the top 10. In AI mode, the name is AI. The player and the score will be updated in "Score" page

2.2 Non-functional requirements

ID	Priority	Requirement	Description
U01	4	Usability	The game should have a user-friendly interface that is simple to use and comprehend, accommodating players of all skill levels
U02	4		Controls, score and game objectives should be explained in detail through game instructions
U03	4		The layout and behaviour of navigation elements and buttons should remain constant across all of the game's sections
U04	4		The game controls should be simple and easy to use to minimise learning time for the players.
R01	4	Reliability	Even if the game is closed, the high score information should be safely stored
R02	4		The game should notify the players in case an error occurs
R03	4		The game should correctly record and update the top 10 high scores
R04	4		The game should be available for players at any time in a day.
P01	4	Performance	The buttons in the user interface should response instantly without any lag to user activities
P02	4		The game should load immediately without significant delays that allows users to play the game shortly after
P03	4		In the game, block moves and line clearing should be smooth and without twitches or abruptness
P04	4		The user interface should quickly inform the changes in state of the game to make sure the players receive real-time feedback
S01	4	Supportability	To make it easier for developers to understand and maintain the game, the code should be well-structured and accompanied by comments
S02	4		To aid in troubleshooting, the game should record faults and exceptions
S03	4		Players should be able to report any errors in the game
S04	4		Analytics should be implemented in the game to gather

			information on user usage and behaviour, which will help enhance the game in the future
SE01	4	Security	To avoid tampering or unauthorised modifications, player names and scores kept in high score system should be safely stored.
SE02	4		The codebase of the game should be examined for vulnerabilities in security
SE03	4		To avoid snooping in on conversations between players, servers and game elements, encryption is needed.
SE04	4		Regular security updates and patches are crucial for maintaining player trust and data protection in game

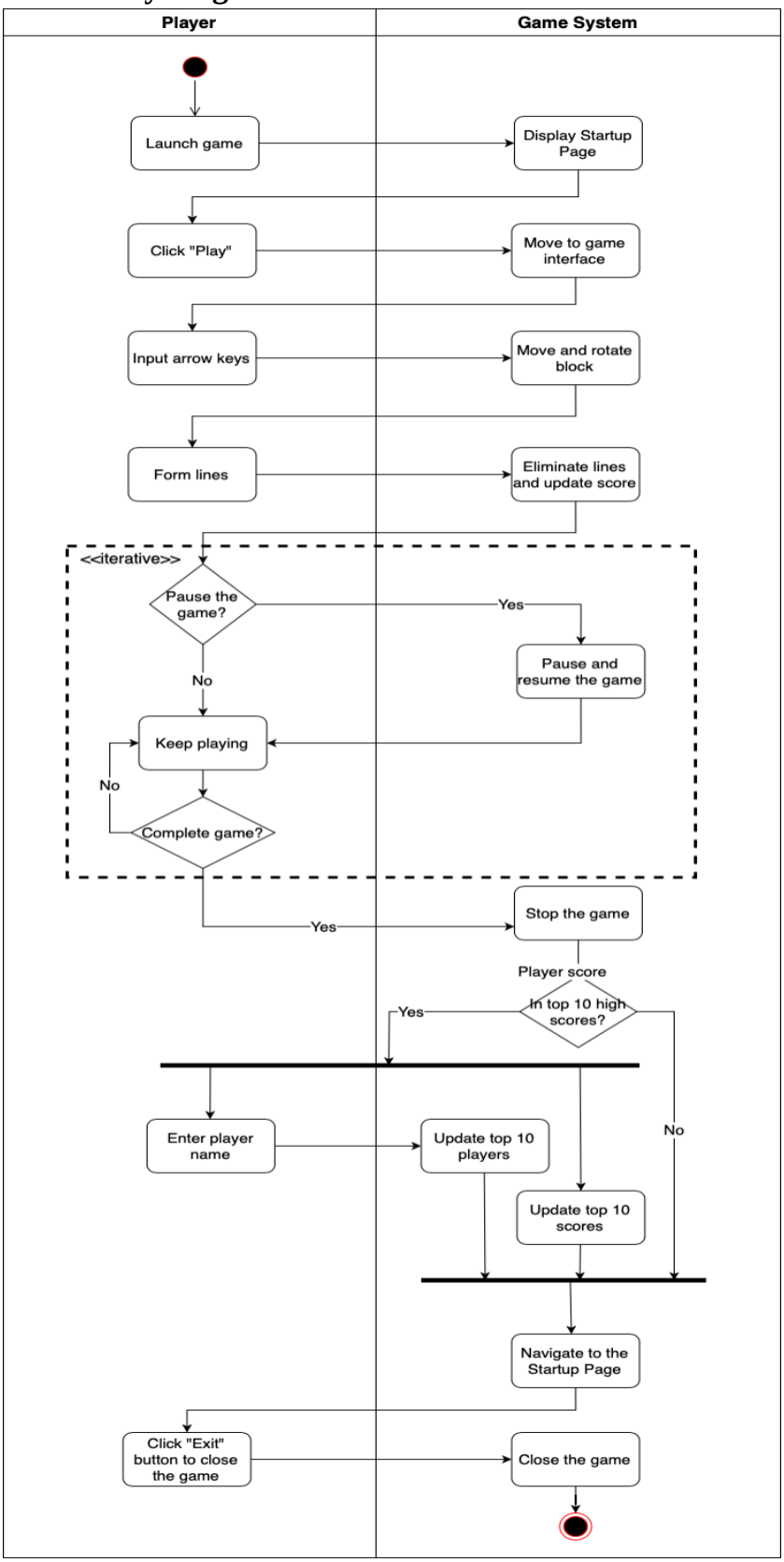
2.3 Use case diagram



2.4 Full use case description

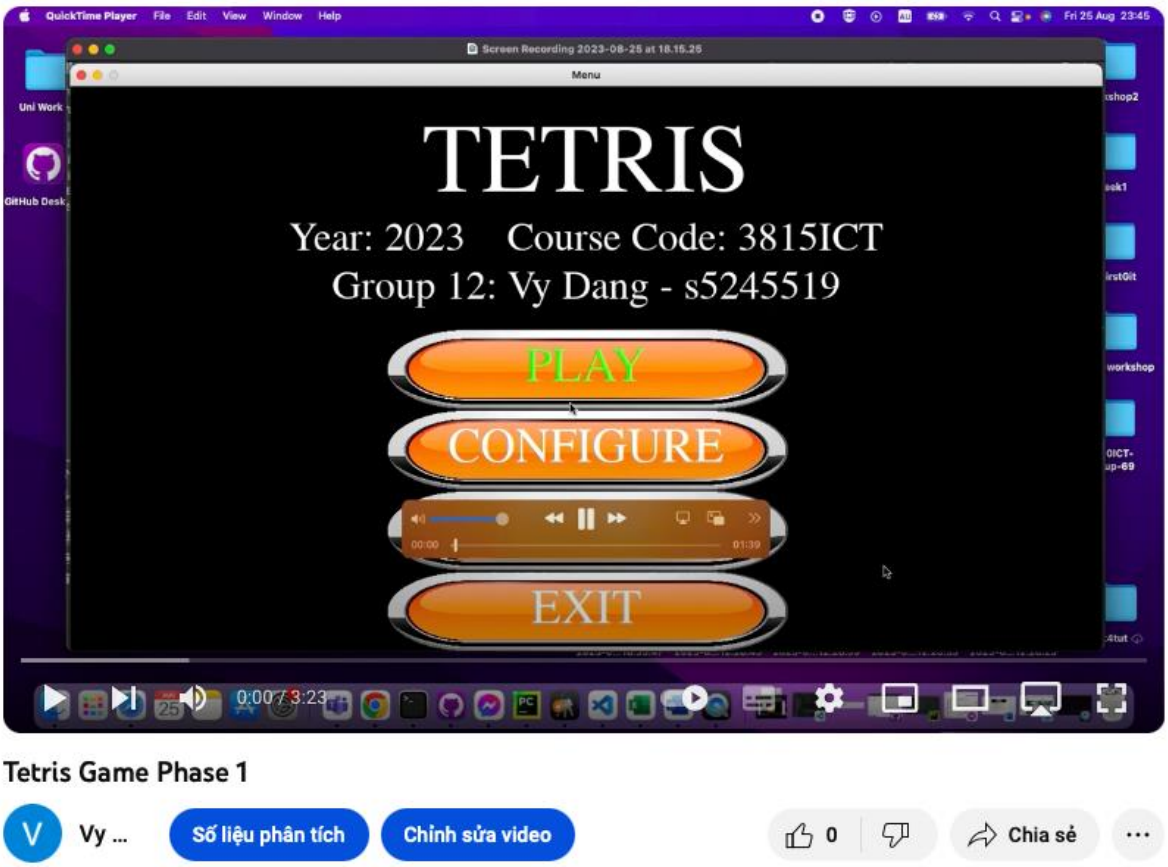
Full Use Case Description		
Use Case Name	Control Game	
Scenario	Playing Tetris Game	
Triggering Event	A player clicks “Play” button to start playing the game	
Brief Description	The player plays the game by using the arrow keys on the keyboards to control the blocks.	
Actors	User, System	
Related Use Case	Might be interrupted by “Stop game” use case. Includes these use cases: Move blocks, rotate block, increase speed. Might extend to pause game, modify music and sound use cases	
Stakeholders	Game developers, Player	
Preconditions	The game is set up and started on the player’s device The player has reached the game Start-up Page	
Post conditions	The player decides to exit the game or lose the game. If the player is in top 10 high score, their name and score must be recoded and updated on “Top 10 Players” table	
Flow of Activities	**Actor**	**Game System**
	1. The player click “Play” button.	1.1 The system transitions to the game interface. 1.2 The system displays game field, falling blocks and other information related to the player and the game.
	2. The player inputs arrow keys to move or rotate the blocks to form complete lines.	2.1 The system shifts the blocks to the left or right, or rotates the blocks, or increase the block speed. 2.2 The system shows the next block on the screen. 2.3 The system eliminates the valid lines. 2.4 The system updates the number of lines cleared and player score.
Exception Condition	1. On older device, the game performance degrades 2. Player input is invalid 3. Player quit the game 4. The blocks stack on each other and reach the top of the game field, the game stops.	

2.5 Activity diagram



3.0 Video link

[please put the URL of your video, and make sure that the video can be viewed by the assessor]
The video is uploaded on YouTube. Here is the link for the video:
https://youtu.be/sSSRfhTyGFE



The video demonstrates the program operating on a Linux-based environment (screen recording on MacBook), and a Windows-based environment (screen recording on a computer). The procedure performed on the program is the same for both environments, and that is:

- Open the program to the start-up page
- Demonstrate “Play”, “Configure”, “Score” and “Exit” buttons on the start-up page
- Display top 10 scores when “Score” button is clicked
- Display “Configure” page when “Configure” button is clicked
- Both “Configure” and “Score” button has an “OK” button which navigates back to the start-up page
- Display game field, a block dropping and other required information when “Play” button is clicked
- Pressing arrow keys can move and rotate the block
- The block reaches the bottom of the field and stop
- Pressing the “ESC” key brings up a dialog box asking whether to end the game. Clicking “Yes” button should return to the start-up page, “No” button should continue the game.

- Clicking the “Exit” button will close the program.

Other functions of the program such as configuring the game in the “Configure” page, recording and updating top 10 players in the “Score” page will be implemented in the later phase.