Final Report:

Name: Abdullah Khan 24i-2563

Name: Faseeh Zafar 24i-2529

Section: SE/CY-A

Course Instructor: Mam Sana Aurangzeb

Introduction of Game:

This project includes developing a tile forming game in which we are supposed to build tiles based on user input of moving in different directions on his/her wish. The game named as “XONIX” comprised of different concepts of coding and programming, and we are allowed to code in C++ and to use the SFML graphics library. It is a popular library as it is mostly used in game development. The game is basically a tile building game in which players are granted power up and bonus points for high scores and there are four levels in this game as easy, mid, hard and continuous. There is also a two-player mode in which two players can play on a single board at the same time.

Game Development Approach:

As advised, we divided the whole project into small tasks and managed it on time. We divided the work equally among us and start doing our tasks. And then we compiled all the code into one and integrated it once so that all functionality is implemented. Here is the division of our steps that are involved in our project:

Planning stage:

The first step was to brainstorm ideas and the concepts that we studied throughout the course. Obviously, we divided the work and then

assigned specific concepts to specific tasks such as Enemy addition is represented in an array and so on. So in this way we divided the whole project and the concepts that will be used in these tasks because as we all know that coding is not hard rather than to build concept on coding. So we brainstormed a lot about each division of game and ended up in a meaningful time spent so that after this we had clear understanding of the game logic and that made our task easier.

Design Phase:

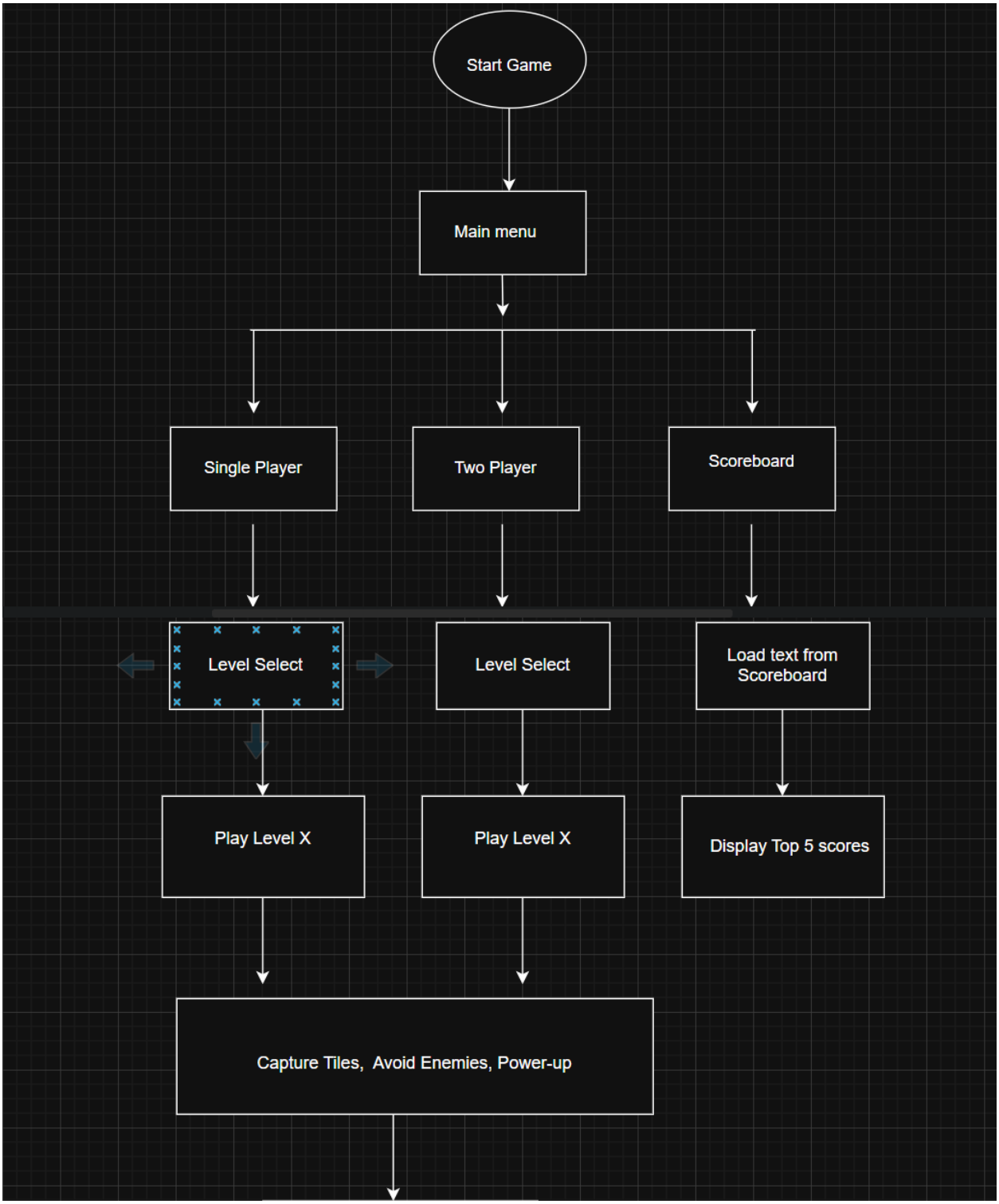
Then comes the design phase in which it comprises of two components as drawing layout and deciding enemy behavior. The drawing layout includes planning the display where each of the timer, score, power-up, bonus on score and move-counter will display and what will be the color of menu and stuff like that. While the second part includes deciding tile behavior as whether we step on tile change its color or not. Can tiles disappear when stepped on or whether special tiles exist? And enemy behavior means enemy movement, and do they follow the player and the speed that they vary as it was a task also to attain specific speed to the player.

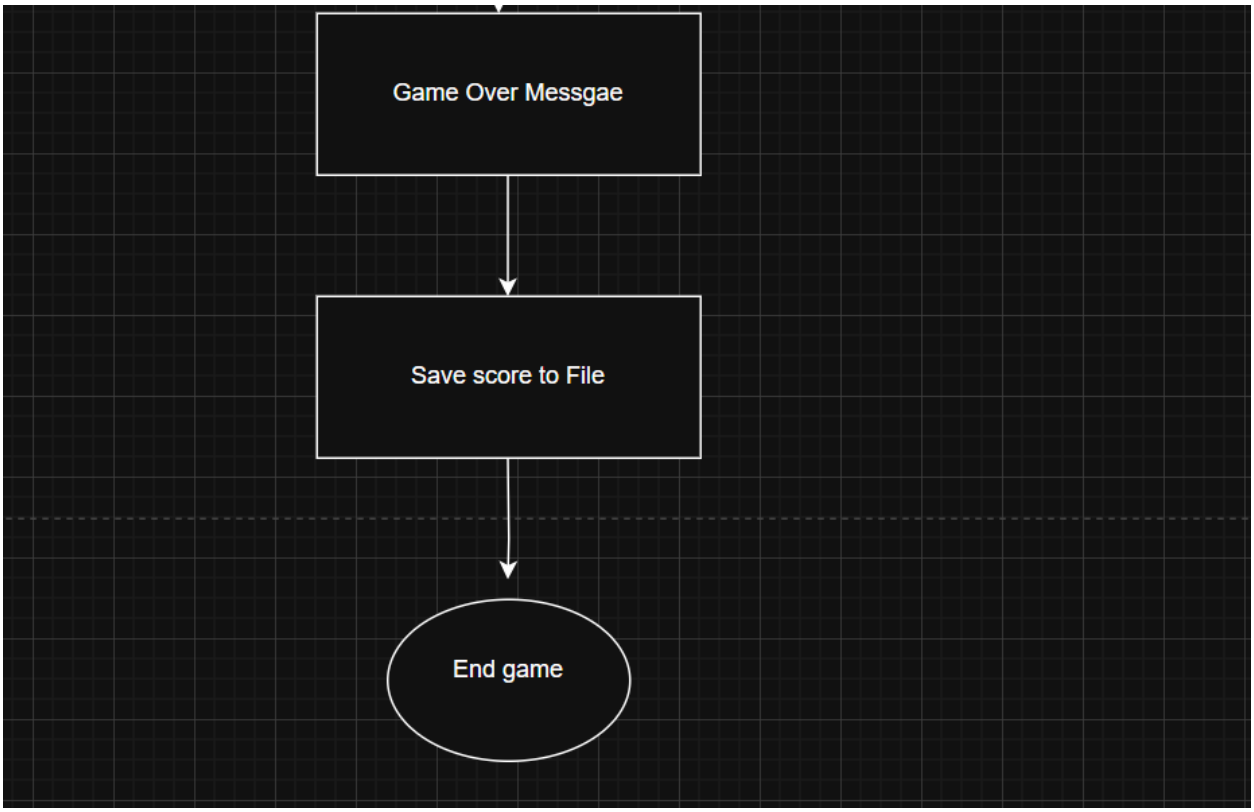
Implementation phase:

Then comes the implementation phase of our project. This phase included coding in C++ with SFML library. This includes handling player movement, animations and score updates as updating score based on player movement and tiles covered. Then to implement it correctly we used testing as debugging player movement, scoring logic and verifying the file-based scoreboard functionality. This was taking time as we had little knowledge of file handling, but we studied its basic functions such as opening, reading and writing in file. Tools were SFML

library as mentioned earlier in game development and graphics, C++ for coding and draw.io for making a flow diagram of our whole project.

Workflow Diagram:





Feature Implementation Status:

Feature	Status	Description
Game menu (Main + levels)	Completed	Fully working; allows mode and level selection using keyboard input.
Scoring by Tile capturing and bonus multiplier	Completed.	Grants score based on covering tiles and Bonus.
Enemy movement	Completed	Random movement with collision detection
Power-ups	Completed	Freeze enemy on pressing space for power-up.
File based Scoreboard	Completed	Stores top 5 scores per mode and level using file I/O
Score sorting	Completed	Scores are sorted and only top 5 are preserved
UI/UX elements	Completed	SFML is used for all text,

		visual and layout. Player score, moves, power-up anf bonus are shown
Game loop structure	Completed	Each level is run in a loop handling input, updates and rendering until win/lose

Task Distribution:

Basic features: Done by Faseeh Zafar.

Difficulty & Enemy Count: Done by Faseeh Zafar.

Movement Counter: Done by Abdulah Khan.

Enemy Speed & Movement: Done by Abdullah Khan.

Scoring & Reward System: Done by Faseeh Zafar.

Scoreboard: Done by Faseeh Zafar.

Two Player Mode Rules: Done by Faseeh Zafar.

Report: Done by Faseeh Zafar & Abdullah khan.