

Implementation

Team 5

Lizard Entertainment

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3rd Party Libraries and Assets

LibGDX - free, open-source Java game development framework, Apache 2.0 license [1]

<https://libgdx.com/>

Its Apache 2.0 license allows us to use the libraries as we wish in our game and to distribute the game, as long as we provide a license and copyright notice [2]. Compared to other Java game engines, there is a wide range of documentation and tutorial information available for libGDX, which makes it easier to learn and troubleshoot. Finally, libGDX has a wide range of libraries, and also a project set-up tool. This made it much easier to create the first iteration of a game, which included only a basic map and a user-controlled sprite, so that we could spend more time on the stakeholder's specific requirements. It also meant that we could exclusively use libGDX libraries for the game, which saved time and effort in looking for and learning about other third-party tools.

libGDX libraries used:

- ashley - Entity Component System (ECS) framework licensed under Apache 2.0 [3], allowed us to implement ECS architecture in the game
- gdx - Graphical components for game e.g. map tiles etc.
- gdx-backend-lwjgl3 - Launcher for game

PlantUML - free resource used for generating diagrams (e.g. UML or Gantt), licensed under General Public License (GPL)

<https://plantuml.com/>

PlantUML was chosen due to the wide range of diagrams it can create and its license.

The GPL license allows us to use and distribute the diagrams we create [4].

Pixilart, Scratch - Online websites used for creating pixel art for sprites and maps

<https://www.pixilart.com/draw>, <https://scratch.mit.edu/projects/editor>

We used these websites because it was easy to use and download the images that we created.

Tiled - Free, open source tool for creating tiles and maps

<https://www.mapeditor.org/>

We used tiled because it is free and open source [5], which means we can run and distribute the software [6]. It allowed us to create the tiles and maps which would make up the game.

Features that are not implemented

Requirement	Functionality not implemented	Justification
UR_VOLUME FR_VOLUME	The game has no volume control or mute options	This requirement was listed as "May". The user can still control the volume using their device's volume control
FR_WIN_GAME	The score is not calculated by factors other than time taken	This was not explicitly listed as a user requirement. It does not reduce the playability of the game in any way.

References

- [1] libGDX website, Features, <https://libgdx.com/> (accessed 4th Nov 2025)
- [2] Open License Helper, Apache 2.0, <https://www.choosingalicense.com/license/apache-2.0> (accessed 4th Nov 2025)
- [3] GitHub, ashley license <https://github.com/libgdx/ashley/blob/master/LICENSE> (accessed 4th Nov 2025)
- [4] GNU, GPL, <https://www.gnu.org/licenses/gpl-3.0.html> (accessed 4th Nov 2025)
- [5] Tiled, “Full-featured Level Editor”, <https://www.mapeditor.org/> (accessed 5th Nov 2025)
- [6] GNU, What is Free Software?, <https://www.gnu.org/philosophy/free-sw.html> (accessed 5th Nov 2025)