# Research Report on the Godot Engine for Our Project

# 1 Introduction

For our adaptation of the multiplayer board game *6 nimmt!*, choosing the right game engine is crucial. Among the various available options, we have selected **Godot Engine** due to its flexibility, open-source nature, and multi-platform capabilities. This report justifies our choice by analyzing Godot's technical strengths and its suitability for our project.

# 2 Why Choose Godot?

Godot is a **powerful open-source engine** that enables the development of **both 2D and 3D games**. It is known for its **lightweight architecture, ease of use, and strong community support**. Here is why it stands out for our project:

## 2.1 Key Advantages

- **Dedicated 2D Engine:** Unlike other engines that treat 2D as an extension of 3D, Godot has a **fully dedicated 2D engine**, making it one of the best choices for 2D game development.

- **Improved 3D Capabilities:** With the release of **Godot 4**, its 3D capabilities have significantly improved.

- **Multi-Platform Support:** Godot allows games to be exported to **PC, mobile (Android, iOS), and web browsers (HTML5/WebAssembly)**, ensuring optimal accessibility.

- **Node-Based Architecture:** Its **node system** enables modular and flexible game design, similar to object-oriented programming (OOP), where each game element (players, objects, enemies) can be managed independently.

- **Multiple Language Support:** Godot supports **GDScript (similar to Python), C#, C++, and JavaScript**, allowing us to choose the most suitable language.

- **Open-Source and Free:** Being **open-source**, it allows full customization and eliminates licensing fees—an important advantage for a student project.

# 3   Application to Our Project

## 3.1   Multiplayer and Networking

Godot offers built-in tools for **multiplayer networked games**, including:

- **High-level networking API** for real-time multiplayer interactions.

- **Custom protocol implementation** to ensure smooth communication between clients and the central server.

- **Cross-platform online compatibility**, allowing players to connect from different devices.

## 3.2   User Interface and Accessibility

- Godot enables the creation of an **intuitive UI** with an easy-to-use drag-and-drop system.

- Supports **responsive design**, ensuring smooth use on tablets (Samsung Tab S9) and PCs.

- **Web export** (HTML5/WebAssembly) allows players to access the game without installation.

## 3.3   Database and Authentication

- Easy integration with **SQLite, PostgreSQL, and other databases** to store **user data, game progress, and scores**.

- **Encryption and authentication mechanisms** to secure player information and prevent cheating.

## 3.4   Artificial Intelligence and Game Logic

- **GDScript** is ideal for AI scripting, facilitating the creation of **computer-controlled opponents**.

- The **node system** simplifies managing game elements such as cards, rules, and player interactions.

## 3.5   Development Efficiency and Collaboration

- **Git Integration:** Godot supports **Git**, facilitating collaboration on **GitLab**.

- **Fast iterations and efficient debugging:** Built-in debugging tools allow real-time fixes.

- **Performance and lightweight design:** Runs well on **low-end hardware**, ideal for a student project.

# 4 Conclusion

Godot Engine is the optimal choice for our **multiplayer board game** due to its **advanced 2D capabilities, strong networking features, ease of use, and multi-platform support**. It enables efficient development, rapid iteration, and deployment across multiple platforms, ensuring a **smooth gaming experience** for all users. Additionally, its **modular system and open-source nature** perfectly align with our project's goals.

By fully leveraging Godot's strengths, we can focus on **gameplay, player interaction, and network stability** to deliver a high-quality final product.

# 5 Video References and articles

- QUEL MOTEUR DE JEU POUR DÉBUTER EN 2024?

- Pourquoi créer un jeu vidéo avec Godot en 2024 ?

- Votre premier jeu avec Godot 4

- Article ActivDesign

- Article Nerd-Mobile