Project Title:

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| Multi-player based open world game (YEPPLE Utopia) |

**Project summary**: (max. 500 words) (Please state the main objectives of the project and its realistic constraints clearly, and the broad final results, also ensure that the project is attainable in one semester)

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| Main Objective & Final Result:  The primary goal of this project is to create an engaging and fun virtual space(an open world) where friends, family, and other groups can strengthen their bonds through cooperative and competitive gameplay, set within a simple open world. It will be a balance between large-scale MMORPG games and simple 'mini-game set' style games.  Mini-Games:   * **Game A - Halli Galli-inspired Card Game**: The first mini-game is a fast-paced, reflex-based card game inspired by Halli Galli. Players take turns playing cards that feature up to 10 different items. The objective is to identify common items between two consecutive cards. The first player to spot the similarity and hit an alarm can play their cards. The person with an empty hand in the last round wins. * **Game B - 3D Rotation Pixel Puzzle**: The second mini-game is a 3D puzzle that challenges players to identify objects made of pixel groups by rotating them to find the precise angle where the object (e.g. banana, cookie) is recognizable.   Open World:   * A simple world where players can interact with each other, offering expandable spaces beyond a basic lobby environment.   Constraints:   * The project, in its final form(after the semester), will be a bigger open-world-based game where players can interact with each other through rich RPG features, including farming and exploring. The current goal is to establish a stable multiplayer environment and two mini-games inside of a simple 3D open world. |

**Problem Statement**: (max. 200 words) (Define what is the problem the project will try to solve)

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| * Large-scale multiplayer games require players to invest a significant amount of time to experience and engage with the game fully. These types of games often demand a substantial time commitment from players to progress, level up characters, unlock new content, and participate in the online community and events. * Existing games centered around mini-games often lack a cohesive sense of completeness and fail to provide a fully immersive gaming experience. Without a heavy narrative or objective tying the mini-games together, players may feel disconnected and unable to become truly engaged in the overall game. * Sandbox-style games place a heavy emphasis on player creativity, which can pose a burden and lead to fatigue for players whose primary desire is simply to enjoy a game for relaxation or fun. The open-ended nature of these games requires players to exercise their imagination and problem-solving skills to a high degree, which some may find taxing rather than entertaining, especially if their motivation is pure amusement. |

**Related works** (No words limit) (describe what are the existing solutions available to solve this problem and you can include Figures or Tables to this section).

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| * Mario Party   The Mario Party series, developed by Nintendo, is a collection of party video games that emphasize multiplayer gameplay, featuring a mix of board game elements and mini-games.  However, the Mario Party games do not provide more than just 'party games'. They are missing an engaging game world that players can get into. This makes it harder for the games to keep players interested and coming back.   * Roblox   Roblox is a massively multiplayer online platform that allows users to create, share, and participate in various game experiences. It stands out for its user-generated content, enabling players to play games and create their worlds and games using Roblox Studio It works well as a creation platform for young users, but its nature as a ‘platform’, huge scale, and creative elements make it difficult for players who just want a light game in a polished and refined environment to get into it. |

**Proposed Solution** (No words limit) (describe the team vision to solve this project problem. This section can include any technical details. Please note that the described solution in this section can be changed later once you start implementing the project solution) You can elaborate on your idea by adding Figures, resources, references, or extra explanations to clarify the proposed solution

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| Simple Open World and Mini-Games   * This project will provide an open-world experience that falls between a simple 'mini-game party' and a fully immersive big-sized MMORPG. Offering a simple but complete game world, it will increase player immersion and provide room to add elements that change based on accumulated gameplay. Organically combining two mini-games with the existing world through various rewards and other features will give players a more diverse gameplay experience.   Multiplayer   * Basic client-server multiplayer element. Players can play the game simultaneously while engaging in real-time text or voice chat. * Use of Dedicated Servers for Game Sessions:   + Unreal Engine supports both dedicated and listen servers. For our game, utilizing dedicated servers can provide a more stable and consistent online experience for players. Dedicated servers are particularly effective in managing game state synchronization across multiple clients, reducing latency, and handling complex game logic. * Replication and Prediction for Smooth Gameplay:   Unreal Engine's networking system provides robust tools for replicating game objects and actions across the network. Combining replication with client-side prediction and correction mechanisms can make multiplayer interactions feel more responsive and smooth.  Technical Solutions-   * Engine - Unreal 5   + Easy implementation of Networking system   + Better handling of 3D graphics   + Blueprint Visual Scripting for Networking     - Unreal Engine's Blueprint visual scripting system includes networking functionalities, allowing developers to implement multiplayer features without deep knowledge of network programming. This accelerates the development process and makes it more accessible to teams with varying technical backgrounds. * Assets - store or handmade voxel design(blockbench..etc)   + Time-consuming works – make use of pre-made assets provided by other users   + Free assets available in various asset stores   + With 3D-pixel-like graphics(e.g. Voxel) can use Blockbench or other simple modeling programs to make quick modifications. |
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**Main functions of the project** (Items that describe the main functions of the project. These functions can be modified or increased later in the implementation stage)

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| * **Open World Exploration**: A simple 3D world for players to freely explore * **Multiplayer Integration**: Seamless integration of multiplayer functionality, allows players to join each other in the open world, form parties or groups, and interact with one another. * **Minigame System**: A system for hosting various minigames within the open world, where players can challenge each other or join ongoing games. * **Social Interactions**: Chat systems (text or voice), emotes, gestures * **Progression and Rewards**: Systems for player progression. leveling up, earning rewards, and unlocking new content, minigames, etc. |

**Time Plan and Roles of Team Members** (this includes time plan for the project stages)

Number of Students (min. 3 students, max. 4 students): 4

List of students:

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| Student ID | Student Name | Contact or Email | Initial Project Role |
| 2019314658 | 박종은 | summer2788@g.skku.edu | Lead director |
| 2018312270 | 양승환 | mjyysh@g.skku.edu | Programming |
| 2019311197 | 이민섭 | mslee720@g.skku.edu | Programming |
| 2018311115 | 장일 | yjang9990@gmail.com | Assets management & design. |

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| Task | Assignment | W3 | W4 | W5 | W6 | W7 | W8 | W9 | W10 | W11 | W12 | W13 | W14 | W15 |
| Networking | 박종은 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UI design | 장일 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version Managing | 양승환 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Open World Managing | 이민섭 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Asset Managements | 장일 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Game Implementation | 이민섭 |  |  |  |  |  |  |  |  |  |  |  |  |  |