

Throne Defense



by Team D:

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Storyline:

This game demonstrates a fancy world called “Goblin Kingdom”. Due to a bug in the space travel system, the player fell here while sitting on his travel throne. The goblins in this world are full of hostility to the sudden arrival of uninvited guests, so the player needs to use summoning magic to create elemental defense towers to buy time to fix the bug of space travel and leave this place.

User manual:

- **Vision control:** The player can use **W, A, S, D** on the keyboard to move the camera. And the **scroll wheel** on the mouse to zoom.
- **Game control:** The player can use **left click** button on the mouse to select the tower **in the toggle UI** at the bottom of the screen. When the tower is selected (highlighted in the toggle), left click on the **light green cubes** to build the tower. The tower is upgradable and destroyable by left clicking the built tower then left click the button **“UPGRADE”** or **“DESTROY”** on the UI that popped out.
- **Towers:** There are four towers available in the game – Crystal (no special effect but cheap), Fire (AoE damage), Ice (freeze) and Earth (stun). The details of each tower are visible at the **bottom right corner** when the tower’s icon of the toggle UI is selected.
- **Stats:** The throne has 10 HP, it takes 1 damage when an enemy touches it. Attention! The game will over immediately if a boss reaches the throne.
- **Pause:** The player can pause the game by pressing **Esc key** on the keyboard. While pausing the game, the in-game menu is activated, the player can access the Option menu, restart current level or exit to main menu.

Features that used in the project:

Custom environment - The map is created at the beginning of each level, using the materials from external assets in Unity Assets Store. The map includes the ground cubes (nodes for building the towers), bush cubes (platforms of the plants, unavailable to build towers), trees (decoration), grass (decoration), route (enemies’ path), the portal (enemy spawner) and the throne (enemies’ target).

Prefabs – For the reuse of the same object, prefabs are imported (modified from 3rd party asset) or created (directly using Unity editor) in this game, including: cubes, plants, enemies, towers, bullets, hit effects, build effect.

Particle systems – The build effect is created with Unity’s particle system, the other VFXs are modified from 3rd party asset (the portal, the bullets, the hit effect and the upgraded towers’ crystal effects).

Animations – The integrated animation from the 3rd party asset is reused to illustrate the movements and the death behavior of the enemies.

Raycast – The clicking detection is implemented using the Raycast, in the script BuildManager.

Physics & Behaviors - In order to implement the detection and attack behavior, Colliders and Rigidbody are added to the ground cubes, the towers, the enemies and the bullets.

- **Ground cube:** A collider is added to the ground cube to respond to the Raycast in order to detect the mouse click event.

- **Tower:** A Collider is added to the tower to represent the firing range. Every time the enemy enters in this Collider, it will be added to the tower's target list; on the contrary, every time the enemy leaves the Collider, it will be removed from the target list. The tower always attack the first member (index 0) of the target list.
- **Enemy:** A Rigidbody is added to the enemy to trigger the tower's Collider. The enemy moves along the waypoints (at each turning of the route) array. The last waypoints coincides with the throne.
- **Bullet:** A Collider and a Rigidbody are added to the bullet to implement the hit behavior. Every time the tower detects its target, a bullet prefab will be generated immediately then move toward the enemy at a high speed. When the bullet hits its target, the self-destroy behavior will be triggered then the damage system operates. If the bullet loses its target for some reason (ex: enemy reaches the throne or enemy is dead while a bullet is flying to it), the self-destroy behavior will be triggered also.
- **Special effect:** A slowing method exists in the basic bullet prefab, only Ice Ball has this value that bigger than 0, which means one Ice Tower's attack can freeze its targets (slow by 30% to 50% in 3 seconds).

An area of effect (Aoe) exists also in the basic bullet prefab, only Fire Tower (small - medium range) and Ice Tower (very small range) have this value that bigger than 0.

A stun method is accessible only by Earth Ball, each hit has 10% chance of stunning the target (slow by 100% in 1 second), only Earth Tower is marked as stunnable.

UIs – A toggle is created at the bottom of the screen as the tower selection interface. A slider is put at the top of the screen as the throne's (player's) hit points. Two text UI are respectively put at the top-right and the bottom-left corner of the screen to display the mana (economy) and the selected (in the toggle) tower's stats.

Menus and loading screen – A preloader (to avoid pink textures while Unity is loading) and a loading screen will be loaded before the game starts. After the progress bar is completed, the player can move to the main menu by pressing any key on the keyboard. During the game, the user can activate the in-game menu by pressing the Esc key, the game will be paused at the same time.

Audio and AudioManager - Sound effects are added to the attack behavior of the towers. A looping background music is also added to the game. In order to modify the volume of the BGM and SFXs in the menu, a AudioManager is created.

Code:

This project is inspired by 600MB and Brackeys, some of the code from this project are referenced from their tutorials.

Unity Answers, Unity Support and Unity forum were also contributed to the development and debug of this project.

Build:

- **Product name:** Throne Defense

- **Icon:** 

- **Cursor:** 

- **Version:** 1.0.0

Sources:

- LaSalle-Montreal LOGO from LaSalle College

- 600MB's tutorial:

<https://blog.600mb.com/a?ID=01000-fd5e36c7-1347-40d6-9202-60d065226cb9>

-Brackeys' tutorial:

<https://www.youtube.com/watch?v=beuoNuK2tbk&list=PLPV2KyIb3jR4u5jX8za5iU1cqnQPm-bzG0>

Models

[Towers] "Awesome Stylized Mage Tower" by Matt Art

<https://assetstore.unity.com/packages/3d/environments/fantasy/awesome-stylized-mage-tower-53793>

[Cubes & Plants] "Mobile Low Poly Battle Arena / Tower Defense Forest Pack" by AuryrSky

<https://assetstore.unity.com/packages/3d/environments/forest-low-poly-toon-battle-arena-tower-defense-pack-100080>

[Enemies] "Goblin & Cannon" by VSQUAD

<https://assetstore.unity.com/packages/3d/environments/fantasy/goblin-cannon-145437>

[Throne] "FREE Egg Coffee Table Set" by Monqo Studios

<https://assetstore.unity.com/packages/3d/props/furniture/free-egg-coffee-table-set-187072>

[Portal] "KY Magic Effects Free" by Kakky

<https://assetstore.unity.com/packages/vfx/particles/spells/ky-magic-effects-free-21927>

Visual Effects

[Bullets & Hit Effects] "KY Magic Effects Free" by Kakky

<https://assetstore.unity.com/packages/vfx/particles/spells/ky-magic-effects-free-21927>

[Flame] "Fire" by QiXingChao

<https://www.cnblogs.com/qixingchao/p/11804623.html>

Icons

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[Fire] "Fire premium icon" by Kosonicon

https://www.flaticon.com/premium-icon/fire_2311317

[Earth] "Rock premium icon" by Freepik

https://www.flaticon.com/premium-icon/rock_1962351

[Crystal] "Quartz free icon" by Freepik

https://www.flaticon.com/free-icon/quartz_4897793

[Mana] "Mana free icon" by Becris

https://www.flaticon.com/free-icon/mana_5966507

[Cursor] "Cursor free icon" by Freepik

https://www.flaticon.com/free-icon/cursor_226878#

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"Beautiful Progress Bar Free" by CYKO

<https://assetstore.unity.com/packages/2d/gui/icons/beautiful-progress-bar-free-194904>

Fonts

"LCD / LCD Mono Font" by Samuel Reynolds

<https://fontmeme.com/fonts/lcd-lcd-mono-font/>

Audios

BGM

<https://music.163.com/#/djradio?id=961678340&order=1&hash=programlist&limit=100&offset=200>

Attack

<https://freesound.org/people/alonsoTM/sounds/396499/>

<https://freesound.org/people/EminYILDIRIM/sounds/541477/>

<https://freesound.org/people/Kostas17/sounds/542825/>