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IMPLEMentation

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Computer ghrapics

CONCEPT:

The concept of my 3D game application is to make a player wander around an island where he must kill the enemies which comes in his way. The game starts with the player, in a house standing. He could move inside as well outside the house. The outside of his house is all covered with zombies which are waiting to kill him. The zombie can only move and chase him if the player comes in their certain chase range. The player is given option to have a gun as well. He is given 3 guns out of which he can switch and shoot with it. The player has to come outside the house to travel the island, but his ways are all covered with zombies. In order to win the game, he needs to kill all the zombie present in the island. The player should target the zombie by using its gun. There are two kinds of zombie there, 5but both looks same. One zombie can attack the player and kill him whereas the other zombie can only chase and attack. Both kinds of zombie are placed together so, player needs to careful going to any zombies. If the player gets attacked 2 times by the zombie, he dies. The player can again play the game if he clicks play again button. The game also consists of menu scene, where the player gets option to choose, start the game, see how to play the game or quit the application.

I've listed the asset references used in the Unity project below. I created all of the content on this project. I didn't collaborate with anyone else. Almost everything I've done has been done entirely by myself, using only Unity documentation and given C# guidelines. Some of the scripts are helped by YouTube tutorials and stack overflow. I have given the URL links in my implementation document table.

CONCEPT VISUALS:

Diagram

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fig i. sketch representing a player shooting guns to enemies to kill them, the player should have a house, trees and hills in his surroundings.

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fig ii., rough sketch of how it would look if the player went from 3rd person camera to second person camera.

REQUIREMENTS:

GAME REQUIREMENTS:

* The game should have a menu in the beginning of the game consisting of start, how to play and quit button.
* The game should open new scene when clicked in start and how to play button.
* The player should be able to move forward, backward, left, and right.
* The player should be able to walk or wander around whole terrain.
* The player should be able to switch between 1st person and 2nd person camera by pressing “a” key in keyboard.
* On 1st person camera player should be able to multiple weapons.
* The player should be able to switch between weapons using “8”, “9”, “0” key in keyboard.
* Huge number of zombies should cover outside the player house.
* The zombies should be able to chase the player and attack him.
* The player health points should be able to decrease when hit by a zombie.
* The player should be able to kill zombie by firing the gun.
* The gun should show the fire sparkles while firing to zombies.
* The player should die if it gets attacked by zombie 2 times.
* The game should be able to represent an attack scene of zombie by using some UI.
* The player should be able to play game again if he dies.

ASSETS REQUIREMENTS:

* The warrior character should be imported from assets> Ergin3d> DireWarrior> Prefab.
* The warrior should have animator component with an animation controller to walk . It should have a Rigidbody to use gravity.
* Terrain should have a terrain component to be able to add terrain texture, trees and grasses.
* The player should have a follow camera using CinemachineVirtualCamera component.
* The weapon in the game needs a spark particle while firing from assets > Conifers [BOTD] > VFX.
* The guns need a reticle image from assets > 20th century weapons collection > misc.
* The font in the game needs to use Text Mesh Pro and should be in zombie font from assets> fonts> zombie\_3
* The zombies should have animator component to have a zombie controller from assets > animation > try1.
* The zombies need to have Nav Mesh Agent for it to move towards player.
* Th 3d game objects like house walls, doors, barrels needs to be added from assets> AssetStoreOriginals> prototype > SciFi\_Industrial.
* The weapons in the game needs to be imported from assets> Easy Weapons > prefabs > weapons.
* The zombie in the game needs to be imported from assets > zombie > prefabs.

ANALYSIS AND DESIGN:

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fig iii, UML diagram of my game system.

IMPLEMENTATION:

|  |  |  |  |
| --- | --- | --- | --- |
| **Object** | **Component** | **My activity** | **Comments** |
| Terrain | Transform | Set Scale |  |
|  | Terrain | Added grass texture, added tress, added grass details |  |
|  | Terrain collider | Added |  |
|  | Mesh Renderer | Added |  |
|  |  |  |  |
| Warrior | Transform | Set position, rotation, scale |  |
|  | Animator | Added a controller from asset |  |
|  | Capsule collider | Added, set material to wood |  |
|  | Rigid body | Set mass to 10, set gravity  Freeze rotation x, y, z | The warrior object was not able to walk straight in terrain & was rotating all direction ,so froze x, y and z. |
|  | Move warrior(script) | Added script, set move speed value to 10. | The warrior object can move in horizontal and vertical direction.  Time.deltaTime is used to make the object frame rate independent. |
|  | Warrierhealth (script) | Added script | The warrior object can lose its health which is shown by hit points.  Calls HandleDeath() function from “warrierdeathhan” script to show gameover canvas when the warrior object loses his health points. |
|  | Warriordeathhan (script) | Added script, added GameOver canvas. | Script to make the Gameover canvas appear only after the warrior object dies.  HandleDeath() is called in “warrierheath” script in TakeDamge() function for the Game over logic to be called. |
|  | UIDamage | Damagedonecanvas added.  Set damageTime to 0.3 | When the warrior takes a damage, Damagedonecanvas is enabled. Disable. the canvas again aftertime has elapsed.  In ShowSpatter() the canvas is enable for 0.3 damageTime and again disabled.  The method ShowDamgeImpact() is being called in AttackHitEvent() in “EnemyAttack” script. |
|  |  |  |  |
| firstcamera | transform | Set position and scale.  Set to inactive | It is only active when the player changes into weapon mode in game. |
| Guns | transform | Set position and scale |  |
|  | GunSwitch (script) | Set current weapon index 0 | Each index of guns are represented by “8”, “9” and “0” key in keyboard.  For SetWeaponActive() took help from this website.  https://stackoverflow.com/questions/66409625/i-do-not-understand-the-mechanism-of-transform-weapon-in-transform-in-unity-c |
| M1A1 | transform | Set position, rotation and scaling |  |
|  | LOD Group | added |  |
|  | Animator | Added |  |
|  | Weapons (script) | Added script, added firstcamera object in FPCamera field, added sparks(particle system) in muzzle flash, added sparks prehab from VFX asset. | GetButtonDown() is used to shoot zombies by button “Fire1”.  We instantiate the particle effect in CreateHitImpact()  Instantiate hit effect is created when our raycast returns true.  Instantiate the effect when raycast collides destroy the hit affect after short amount of time. |
| ShortGun | Transform | Set position, rotation and scale |  |
|  | Weapons (script) | Added |  |
| Pistol | Transform | Set position, rotation and scale |  |
|  | Weapons (script) | added |  |
| cameramonitor | transform | Set position amnd scale |  |
|  | Zoomcamera (script) | Added script | Took help from the YouTube video:  **https://www.youtube.com/watch? v=nR5P7AH4aHE&ab\_channel=JimmyVegas** |
|  |  |  |  |
| UI | transform | Set position, scale |  |
| Reticle | Rect transform | Set width, height, anchors and scale.  Added image from misc folder in asset. |  |

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| --- | --- | --- | --- |
| ui | transform | Set position and scale |  |

|  |  |  |  |
| --- | --- | --- | --- |
| GameOverCanvas | Canvas  Canvas scaler  Graphic raycaster  Warrierdeathhan (script) | Set sort order to 10.  Added script  Added GameOvercanvas int the field | Shows the GameOverCanvas after the warrior object dies in the game. |
| Method session | transform |  |  |
|  | Scene loader(script) | Added script | Rolaods the scene 1 i.e. newtry when the play again button is clicked.  Took help from unity documentation. |
| Warrier died | Rect transform | Set width, height, pos X , pos Y |  |
|  | textMeshPro |  |  |
|  |  |  |  |
| Playagain but | Rect transform | Set width, height, posy |  |
|  | image | Set color red, |  |
|  | Method session (script) | added runtime script | Added script to reload the game when clicked. |
|  |  |  |  |
| Exit but | Rect transform | Set pos Y , width, height.  Set color red. |  |
|  | Method session (script) | Script added | QuitGame() function added to quit the application when the button gets clicked. |
| Zombie | Transform | Set position, rotation and scale. |  |
|  | Capsule collider | added |  |
|  | animator | Added zombie controller from animation folder in assets. |  |
|  | Nav Mesh Agent | Set stopping distance to 3 |  |
|  | zombiedestroyer (script) | Added script.  Has damage value as 50. | When zombie attack the warrior AttackHitEvent() occurs which makes the warrior the damage of 50 in each hit. |
|  |  |  |  |
| Zombierun | transform | Set position, rotation and scale. |  |
|  | Capsule collider | added |  |
|  | animator | Used warrierwalk controller from animation foler in assets. |  |
|  | Nav Mesh Agent | Set stopping distance to 4 |  |
|  | Enemy Attack (script)  zombiedestroyer(script) | Scritp added |  |
|  | Enemy AI (script) | Set target to warrior object,  Set the chase range. | Zombie tries to chase the targeted warrior if the target is within its ChaseRange of 5.  If statement to make zombie move if player is within its range |
| DamagedoneCanvas | Canvas,  Canvas scaler,  Graphic raycaster |  |  |
| Blood | Rect transform | Set pos X, pos Y, pos Z, width, height |  |
|  | Image | Source image is from “Conifers[BOTD]” folder from assets.  Set color.  Link for the image:  https://www.cleanpng.com/png-blood-png-image-55111/ |  |
| Instructioncanvas | Canvas,  Canvas scaler,  Graphic raycaster |  |  |
| Details text | Rect transform | Set pos X, pos Y, width, height |  |
|  | Text Mesh Pro |  |  |

For “menu” scene

|  |  |  |  |
| --- | --- | --- | --- |
| Canvas | Menusceneload (script) | Script added |  |
| Image | image | Added image in source image.  Link https://www.artstation.com/artwork/LbN3Kof image: |  |
| Start button | Rect transform  Button  Menusceneload (script) | Changed the button colour, highlighting colour and pressed colour.  Script added. | When the start button is clicked our game starts. |
| HTP but | Rect transform  Button | Changed the button colour, highlighting colour and pressed colour. |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Quit but | Rect transform  Button  Menusceneload (script) | Changed the button colour, highlighting colour and pressed colour.  Script added. | When the quit button is clicked our application quits. |
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EVALUATION:

I think the game design and the functioning of my finished game reached my expectations and vision for it. It exactly designed how I was expecting to look like and also functions int the way that I was visioning for. I feel like I managed to make a decent game where the player can wander in whole island, kill zombies and also could be killed. I was also successful in making zombies chase the player. The biggest problem I had while making the game was the terrain part. Because my terrain has hill and slopes whenever the player walked in it used to enter inside or down the terrain, but after playing with lot of components and using rigidbody, mesh collider I happen to solve the problem. I had lots of things to add in the game if I had time. I would have added a score UI so when every time player hits zombies it would give the player the score. Also, if I could add a rotate function to the player, so that I could rotation in all directions. I believe I have learned a lot about unity and scripting doing this coursework. At first, I had little knowledge about the components of game objects but later playing with it a lot, I grabbed a good knowledge of it.