HIDDEN GEM

Hidden Gem

GAME DESIGN DOCUMENT

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CPW

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Game Overview

What is the Game About?

Discuss what the game is about, including the game play style, game mechanics and the summary of the game content.

A 3D Top-down stealth game where you play as a thief hunting down gems and crystals place across each room. Your objective is to find every crystal hidden in each room and find an escape in the prison while avoiding the prisoner guard.

UI Keys, Timer

Game Theme

Fantasy

Game Genre

What is the game genre? (Action FPS, Action Hack and Slash, RPG, RTS, Platformer)
Action stealth game

Game Platform

What is the intended game platform? (PC, Console (PS4, XBOX, NINTENDO, Mobile)
PC

Game Story

Discuss about the game story, what is the motivation of the characters of the game, what is the end goal/objective, who are the villains in the game etc.

You played as the anti-hero/protagonist of this story. You are trapped inside this prison cell and your objective is to escape and steal all the precious gems and avoid all the guards. Having been locked in here many times you have been too similar with the security...Your destination should be the only exit near the cemetery.

Target Audience

Who is the game intended for? (Teenagers, Kids, Adults, Everyone)
For teenager or adults who likes action stealth games.

Version Control/Source Code Management Platform

GitHub

ART

Characters

Hero Characters

Villain Characters

NPC (Non Playable Characters)

N.O	Name of Character	Type	About the Character	Abilities
1	Timmy II 	Villain	The protagonist is known for his brute strength and horrid personality. Without reasoning he would knock out anyone with a punch in the face. Because of that he's been locked in this prison cell.	He can knock the guards from behind, attack, jump

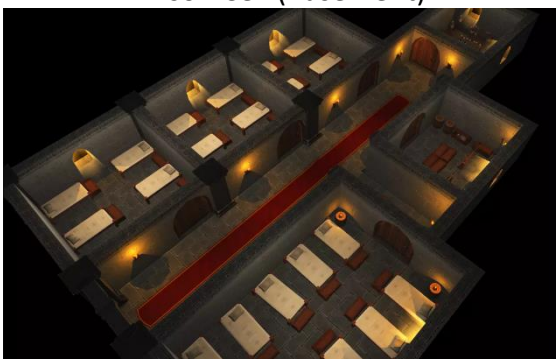
N.O	Name of Character	Type	About the Character	Abilities
1	Guards (Level 2) 	Enemy	The guards that oversee the upper prison cells/police station	Will chase after the player/Timmy II if hit/spotted Can kill the player when in range

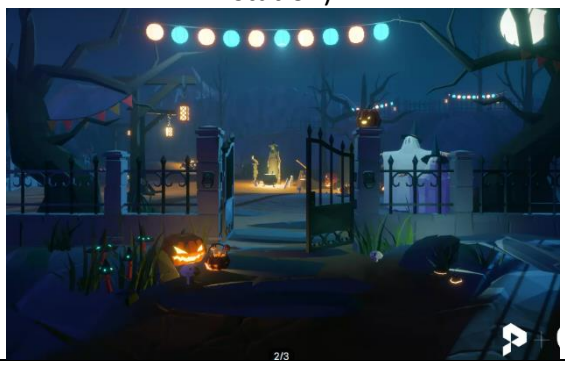
2	Guards (Level 2) 	Enemy	The guards that oversee the cemetery but can also chase and attack the player	Will chase after the player/Timmy II if hit/spotted Can kill the player when in range

Environments/ LEVEL DESIGN

REGIONS:

Discuss the overview what is Region 1 about

N.O	Name of Region	Levels	Objectives of the Level	Challenges of the Level/Enemies
1	Tutorial (Prison Cell inside)	Level 0	This is the tutorial stage where you learn the basic mechanics. -when is time to eat, the guard will deliver the food to your prison cell you are supposed to hit/punch the guard from behind to drop the key (main gate only), the guard will stay unconscious for 8seconds, then run out of your prison cell and lock/close the door then level 1 will start.	That one guard that serves you food
2	Prison Cell (Basement) 	Level 1	-when a crystal is collected an additional 10seconds will be added to the timer (you want to have more time to escape) -Find 8 gems and the door to escape/ proceed to the level 2	Time, prison guards
3	Metropolitan Police station	Level 2	-Find 8 gems -Avoid guards -Reach end goal along with the main gate key to win the game	Time, prison guard Obstacle (doors. Gate)

	 (Above prison cell level)			
4	Cemetery (outside right next to police station) 	Level 2	-Avoid the plague doctors	Timer, Plague Doctor

UI DESIGN

Discuss the types of UI design and the art style of the UI design that will be used. (Dark Theme, Brown Background with cartoony style game logo and UI buttons, game win and game lose.
Insert 3 different example images from other games for the inspiration for your UI design.

Fantasy Medieval Style

FINAL UI/GAME DESIGN

SOUND DESIGN

Background Sound

Discuss how many backgrounds sound will be in the game (3-5) and how it will be used in the game
BG Sound 0: Dialogue Lvl 1 (right after tutorial level)
BG Sound 1: Level 1 (Prison basement, prison Cell)
BG Sound 2: Level 2 (Police station &Cemetery)
BG Sound 3: Tutorial/Level 2 (When guards find you and chase you down)

Sound Effects

Discuss the main sound effects to be used for the game

Sound FX 1: Attack sound
Sound FX 2: Running sound
Sound FX 3: Door closing sound
Sound FX 4: Game Over Sound/Death sound
Sound FX 5: Pick up sound
Sound FX 6: UI sound
Sound FX 7: Dialogue sound

PROGRAMMING

GAME SYSTEMS

Discuss the game systems and rules that the game will have

Game logic/games rule & condition/challenge in each level

- Tutorial level

-when is time to eat, the guard will deliver the food to your prison cell you are supposed to hit/punch the guard, the guard will stay unconscious for 8seconds

- Prison Cell Level

- A dialogue system will be played first before the game starts
-Find 8 gems
-when a crystal is collected an additional 10seconds will be added to the timer (you want to have more time to escape)
-Complete mission before the gate close

- Police station/cemetery

-Find 8 gems
-Escape and avoid prison guard
-Reach end goal along with the key to win the game

GAME MECHANICS

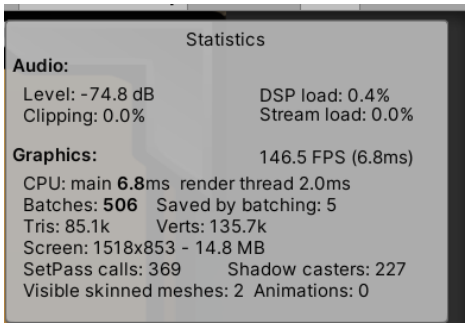
Discuss the game mechanics to be used for the game. This includes the attack moves, defend moves, combo moves etc of the hero and enemy characters. Also include the triggers such as pick up items (speed pick up, health picks up, weapon pick up) etc. Map out the game controls to the keyboard and mouse image seen below

- Player can knock the guards from behind/when guard not facing the player
- Player collects gems to add more to the timer.
- Player can run when press shift but might alert the guard

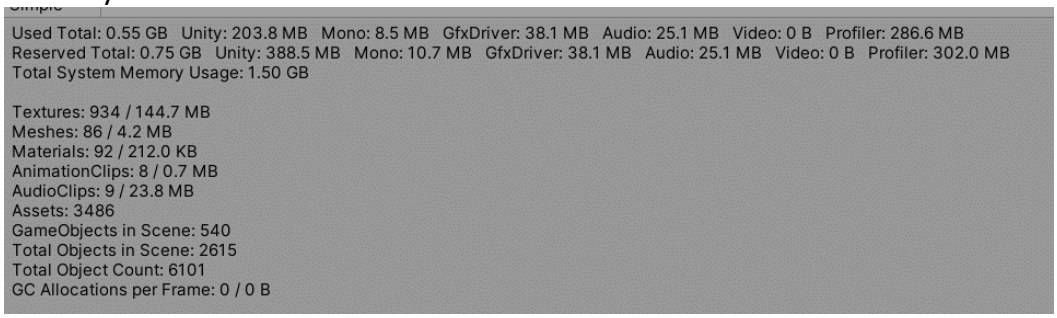
- WASD/Arrow keys & mouse rotation to move
- Escape to Pause
- Left Click Attack
- Left shift to Sprint
- Left Click Mouse on UI button
- Space bar jump

Unity Profiler Screenshot

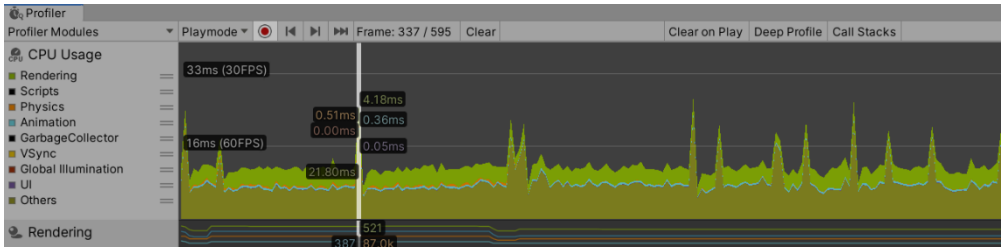
Statistics



Memory: 0.55GB



CPU



Code Optimisation Method

We used Extract method, Inline method, Machine-independent optimisation for our Code Optimisation.

Extract method

```
void FixedUpdate()
{
    //&& !GameManager.Instance.isGameOver
    if (PlayerTransform != null && IsActive)
    {
        if (!PlayerInSightRange && !PlayerInAttackRange) Patroling(); HearPlayerLocation();
        if (PlayerInSightRange && !PlayerInAttackRange) ChasePlayer();
        if (PlayerInSightRange && PlayerInAttackRange) AttackPlayer();
        animator.SetBool("EnemyIsActive", true);
    }
    else
    {
        animator.SetBool("EnemyIsActive", false);
        Halo.active = true;
        Invoke("GetUPInBseconds", 8.0f);
    }
}
```

```
private void HearPlayerLocation()
{
    //Player.GetComponent<FirstPersonController>().m_IsWalking == false &&
    start1:
    float HearDistance = Vector3.Distance(transform.position, PlayerTransform.position);
    if (HearDistance < HearRadius)
    {
        //If Got Hear go to the player location but if player move somewhere
        SoundPoint = PlayerTransform.position;
        navMeshAgent.SetDestination(SoundPoint);
        animator.SetBool("EnemyRunning", true);
        //else without making sound the boss/monster will go to the location
        //where the last time makes the sound
        Vector3 distanceToSoundPoint = transform.position - SoundPoint;

        //SoundPoint Reached
        if(distanceToSoundPoint.magnitude < 1f)
        {
            animator.SetBool("EnemyRunning", false);
            goto start1;
        }
    }
    else
    {
        //If Didn't hear anything
        return;
    }
}
```

```
private void SearchWalkPoint()
{
    //Calculate random point in range
    float randomZ = Random.Range(-WalkPointRange, WalkPointRange);
    float randomX = Random.Range(-WalkPointRange, WalkPointRange);

    WalkPoint = new Vector3(transform.position.x + randomX, transform.position.y, transform.position.z + randomZ);

    if (Physics.Raycast(WalkPoint, -transform.up, 2f, Ground))
        WalkPointSet = true;
}

private void ChasePlayer()
{
    IfAttackPlayer = false;
    animator.SetBool("EnemyRunning", true);
    navMeshAgent.SetDestination(PlayerTransform.position);
}

private void AttackPlayer()
{
    IfAttackPlayer = true;
    animator.SetTrigger("EnemyAttack");
    transform.LookAt(PlayerTransform);
}

private void OnCollisionEnter(Collision collision)
{
    if(collision.gameObject.tag == "Obstacles" || collision.gameObject.tag == "Boss")
    {
        CannotReachWalkPointOrCompletedWalkPoint();
    }
}
```

```
private void Patroling()
{
    if (!WalkPointSet) SearchWalkPoint();

    if (WalkPointSet)
    {
        navMeshAgent.SetDestination(WalkPoint);
        Vector3 distanceToWalkPoint = transform.position - WalkPoint;
        animator.SetBool("EnemyRunning", true);
        IfAttackPlayer = false;

        //Walkpoint reached
        if (distanceToWalkPoint.magnitude < 1f)
        {
            CannotReachWalkPointOrCompletedWalkPoint();
        }

        //If it cannot reach walkpoint
        if (distanceToWalkPoint.magnitude > 1f && WalkPointTimer >= 3.5f)
        {
            CannotReachWalkPointOrCompletedWalkPoint();
        }
    }
}

void CannotReachWalkPointOrCompletedWalkPoint()
{
    WalkPointTimer = 0;
    WalkPointSet = false;
    IfAttackPlayer = false;
    animator.SetBool("EnemyRunning", false);
}
```

```
private IEnumerator FOVRoutine()
{
    WaitForSeconds wait = new WaitForSeconds(0.2f);

    while (true)
    {
        yield return wait;
        FieldOfViewCheck();
    }
}
```

```
private void NoRange()
{
    CanSeePlayer = false;
    PlayerInSightRange = false;
    PlayerInAttackRange = false;
}

public void OnHit()
{
    transform.LookAt(PlayerTransform);
}
```

```
private void FieldOfViewCheck()
{
    Collider[] RangeChecks = Physics.OverlapSphere(transform.position, SightRadius, WhatIsPlayer);

    //We only want the first one because we only have one player but
    //there mulitple objects in the layer so
    if (RangeChecks.Length != 0)
    {
        for (int i = 0; i < RangeChecks.Length; i++)
        {
            Transform target = RangeChecks[i].transform;
            //Normalized to get a value between 0 and 1
            Vector3 directionToTarget = (target.position - transform.position).normalized;

            //We divide it to two cause the enemy is facing forward, so you got
            //half the angle to the left and half to the right so we want to narrow by half
            //to do a detail angle check
            if (Vector3.Angle(transform.forward, directionToTarget) < angle / 2)
            {
                float DistanceToTarget = Vector3.Distance(transform.position, target.position);

                //Check if there no obstacles in the way for the boss to see the target
                //If there obstacles the boss line of view will be block by it
                if (!Physics.Raycast(transform.position, directionToTarget, DistanceToTarget, Obstacles))
                {
                    PlayerInSightRange = true;

                    //Check for attack range
                    float AttackDistance = Vector3.Distance(transform.position, PlayerTransform.position);
                    if (AttackDistance < AttackRadius)
                    {
                        PlayerInAttackRange = true;
                    }
                    CanSeePlayer = true;
                }
                else
                {
                    NoRange();
                }
            }
            else
            {
                NoRange();
            }
        }
    }
    else if (CanSeePlayer)
    {
        NoRange();
    }
}
```

MANAGEMENT

SCHEDULE OF GAME PRODUCTION (8 WEEKS)

Roles and Responsibility

Erina

Role: Programmer, Game Level Designer

Responsibility: Find Art & Sound assets, create level design (Tutorial, Lvl1 and Lvl2), Implement win and lose conditions in Level 1, character controller; player's movement and animation. Door auto open/close movement. Gem collection script. UI: Timer, Gem count, dialogue system, game able to pause, replay or go next level. Particle & lighting system. Merge and finalise all scenes and levels.

Tiffany:

Role: Programmer

Responsibility: Find Art & Sound assets, AI enemy controller and enemy's detection behaviour and logic, player & enemy interaction logic, implement game mechanic and rules condition to win or lose for Tutorial level and Level 2.
Polishing game level tutorial and level 2

Si yin:

Role: Artist

Responsibility: Find Art & Sound assets, Design Game Logo and UI for Game Over and Game Win. Design menu screen. Implement logic to start and quit game.

Days	Week 1		Week 2			Week 3	
Find all Game Asserts needed Design basic level design							
Start scripting and implementation of game rules &mechanic							
Finish Level 0 Check for bugs & errors Add lighting							
Finish Level 1 Check for bugs and errors add lighting							
Finish Level 2							

Check for bugs/errors Add lighting URP							
Do Test case/ Intergration Testing Check & upload all files on Git. Do game trailer and final polishing of the game							

REFRENCES

Add the references (with accompanying images and website link) of the game assets used for your game.

Erina

BGM Level 0 (dialogue)

https://opengameart.org/content/stealth-mode-stumbling

BGM Level 1

https://opengameart.org/content/waltz-of-the-ghosts

Gem collects sound
https://opengameart.org/content/picked-coin-echo
Confetti pop sound effect
https://opengameart.org/content/3-pop-sounds
Game Win Soundtrack Lvl1
https://opengameart.org/content/medieval-victory-theme
Game Lose Sound Lvl1
https://opengameart.org/content/sad-game-over
Character death sound lv1
https://opengameart.org/content/death-sounds-0
Character assets
https://assetstore.unity.com/packages/3d/characters/humanoids/rpg-tiny-hero-duo-pbr-polyart-225148
Character Controller
https://assetstore.unity.com/packages/tools/physics/character-controller-smooth-173259
For cemetery level
https://assetstore.unity.com/packages/3d/props/poly-halloween-236625
Jail Door
https://opengameart.org/content/simple-jail-door
Jail door sound effect
https://opengameart.org/content/iron-door
Gems
https://assetstore.unity.com/packages/3d/props/simple-gems-ultimate-animated-customizable-pack-73764
Drawer
https://sketchfab.com/3d-models/drawer-4fc1290f28094847af7dd87b14cafc29
Particle Effect – Confetti
https://assetstore.unity.com/packages/vfx/particles/sherbb-s-particle-collection-170798
Dialogue UI sound effect
https://opengameart.org/content/gui-sound-effects-1

Tiffany
Castle/Dungeon assets
https://assetstore.unity.com/packages/3d/environments/dungeons/modular-castle-121360
https://assetstore.unity.com/packages/3d/environments/dungeons/low-poly-dungeons-lite-177937
https://assetstore.unity.com/packages/3d/environments/dungeons/ultimate-low-poly-dungeon-143535
Guards
https://assetstore.unity.com/packages/3d/characters/toony-tiny-rts-demo-141705
https://assetstore.unity.com/packages/3d/characters/humanoids/fantasy/lowpoly-medieval-plague-doctor-free-pack-176809

Animations:
https://www.mixamo.com/#/?page=1&query=Got+up
https://www.mixamo.com/#/?page=1&query=Fight

Food & Tray
https://assetstore.unity.com/?category=3d&free=true&q=tray&orderBy=1
https://assetstore.unity.com/packages/3d/props/food/rpg-food-drinks-pack-121067

Book
https://assetstore.unity.com/packages/3d/props/books-scrolls-and-other-things-hdrp-urp-standard-198855

Tutorial on knocking guard from behind
https://docs.unity3d.com/ScriptReference/Vector3.Dot.html

BGM
Level 2 BGM
https://opengameart.org/content/evasion

Chase by Guard BGM
https://opengameart.org/content/dream-raid-cinematic-action-soundtrack

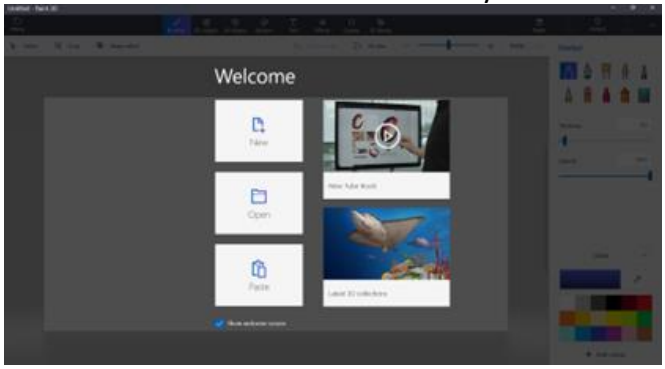
Sound Effect:

Halo:
https://sketchfab.com/3d-models/angel-crown-wael-tsar-c20681970f3f4e449aeec50291be17b1

Teleporter
https://skfb.ly/otMuR

Si yin

Game UI Win and Lose Scene done by 3D Paint- Lenovo



UI pop out message:
https://assetstore.unity.com/packages/2d/gui/fantasy-wooden-gui-free-103811

UI button and message:
https://assetstore.unity.com/packages/2d/gui/rpg-fantasy-mobile-gui-with-source-files-166086
Sound Effect website:
https://pixabay.com/sound-effects/search/button%20click/

Screen Resolution settings:
https://www.youtube.com/watch?v=HnvPNoU9Wjw&ab_channel=RootGames

Sound Settings:
https://www.youtube.com/watch?v=rdX7nhH6jdM&ab_channel=RehopeGames