Temasek Polytechnic

School of Informatics & IT

Diploma in Game Design and Development

Escaping Reality Technical Report

**Project Particulars**

| **Supervisor** | Mr. Sean Lim |
| --- | --- |
| **MP Project Title** | VR for GDD Open House - Escaping Reality |

**Project Team’s Particulars**

| **Admission Number** | **Student Name** |
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GitHub Link: <https://github.com/RotX18/MP_Group4_EscapingReality>

Google Drive: <https://drive.google.com/drive/folders/1YqW9vef0xun3Dn1d5Hlox_gY3eqe_IX6?usp=sharing>

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***[Who has worked on every section of the MP final report must be clearly indicated. You must write Authored by: Xxx Yyy under the appropriate section headings.]***

# Components Design

## Components

***Description of all the components used in the game. Write all the component in the game and what is its purpose***

| ***Component Name*** | AudioHandler.cs |
| --- | --- |
| ***Description*** | *Script prevents the audio from stopping between scenes* |
| ***Variable*** |  |
| ***Function*** | Awake() - Sets the game object to not be destroyed in scene transitions  Detailed documentation: <https://github.com/RotX18/MP_Group4_EscapingReality/issues/118> |
| ***Game Object attached to*** | ***What is the game object it is attached to?***  *Audio Handler object* |
| ***Author*** | ***Who created the script***  *Ryan* |

| *Component Name* | Battery.cs |
| --- | --- |
| *Description* | *Handles how the battery behaves when picked up, thrown and hitting the battery socket* |
| *Variable* | public GameObject lCon, rCon - Used to determine the positions of the left and right controllers respectively  public GameObject spawnerLocation - Used to spawn the battery  public float throwForce - Offset multiplier for use in throwing  private Rigidbody \_rb - Used for throwing physics  private Vector3 \_lConLastPos, \_rConLastPos - Used in speed calculation  private float \_lConSpeed, \_rConSpeed - Used in speed calculation  private bool \_pickedUp - Used to determine whether the battery is picked up |
| *Function* | *OnRelease() - IPickable interface method called when the object is released; Calls Throw when released*  *Update() - Calculating and updating the speed of each individual controller to be used in Throw()*  *Throw() - Adding the force relative to the controllers’ speed and throw force.*  *OnCollisionEnter() - Teleporting the battery back to its original location if the battery is not picked up and the surface being hit does not have the tag of “ActivateClock”*  *Detailed Documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/67*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/67) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Battery object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | ClockActivator.cs |
| --- | --- |
| *Description* | *Sets all clocks to their appropriate timings* |
| *Variable* | public GameObject[] clocks - Used to reference all the clocks in the scene  public GameObject arrowPointer - Shown when the clocks are activated  public GameObject batteryHolder - Used to update the model when the battery hits this game object  public GameObject pointVisualiser - Used to show where the player is pointing (used in the next puzzle; The grid puzzle)  public TextMeshProUGUI text - UI text to be updated  public GameObject canvasUI - Used to set the hint UI to true when inserting the battery  private Vector3 \_objPos - Used to store the object’s position  private Quaternion \_objRot - Used to store the object’s rotation |
| *Function* | *OnCollisionEnter() - “Inserts” the battery into the socket if the colliding object has the name of “Battery” by instantiating the version of the model with the battery in and destroying both the battery and the current game object*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/67*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/67) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Battery Socket object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | DoorLock.cs |
| --- | --- |
| *Description* | *Plays the door unlocking animation and allows the player to exit when the key collides with the attached collider* |
| *Variable* |  |
| *Function* | *OnTriggerEnter() - Sets the Unlock property in the Key component of the colliding object to true if the object has the name of “PlayerKey”*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/76*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/76) |
| *Game Object attached to* | *What is the game object it is attached to?*  *The lock on the door* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | Key.cs |
| --- | --- |
| *Description* | *Responsible for opening the door if the conditions are met* |
| *Variable* | public Animator anim - Animator reference to trigger the key and door animation  private bool \_unlock - Used to determine whether the key has been inserted  private int \_doorUnlock - Used to trigger the specific door unlocking animation |
| *Function* | *OnRelease() - IPickable interface method called when the object is released, destroys this object if the key has been inserted*  *OnDestroy() - When destroyed, trigger the door opening animation*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/76*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/76) |
| *Game Object attached to* | *What is the game object it is attached to?*  *The key that spawns in the cabinet when the lock is solved* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | GridElement.cs |
| --- | --- |
| *Description* | *Defines a single element to be spawned and accessed by the grid spawning system* |
| *Variable* | private int \_posX, \_posY - Position of the element in the grid  private int \_id - Id of the element  private bool \_correctElement - Whether the element is correct  private bool \_clickable - Whether the element can be interacted with  private bool \_clicked - Whether the element has been interacted with  public int GridX, GridY{} - Accessor properties for \_posX and \_posY respectively  public int ID {} - Accessor property for \_id  public bool Correct{} - Accessor property for \_correctElement  public bool Clickable{} - Accessor property for \_clickable  public bool Clicked{} - Accessor property for \_clicked |
| *Function* | *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/2*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/2) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Grid Element prefab* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | GridInput.cs |
| --- | --- |
| *Description* | *Handles player interaction with the grid* |
| *Variable* | public GameObject pointerOrigin - Used for Raycasting  public gridSpawner gridSpawner - Reference to the grid spawner this script will be managing  public gridManager gridManager - Reference to the gridManager this script will be passing/editing values  private Ray \_pointerRay - Used for Raycasting  private RaycastHit \_hit - Raycast hit data  private GameObject \_hitObj - Object hit by Raycast  private int \_intendedCorrectIndex - Used to keep track of next correct element  private List<GridElement> \_elements - List to store all elements in the given grid  private Dictionary<int, GridElement> \_correctEles - Dictionary to store all correct elements and their IDs  private Dictionary<int, GridElement> \_wrongEles - Dictionary to store all wrong elements and their IDs |
| *Function* | *Update() - checks whether the clicked grid object is valid and clickable, if so, reset the entire grid if the element is wrong and clickable or change the colour if its correct and progress onto the next row*  *FixedUpdate() - Raycasts from the right controller in the forward direction of the player*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/2*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/2) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Grid object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | GridManager.cs |
| --- | --- |
| *Description* | *Responsible for keeping track of and managing correct, wrong, clickable and completed elements* |
| *Variable* | public GameObject pointVisualiser - Used to show/hide the pointer  public GridSpawner spawner - Reference to grid spawner and its data  public int[] correctElementIDs - Array that stores the IDs of all correct elements  private List<GridElement> \_elements - List that stores all elements pertaining to the current grid  private List<GridElement> \_currentRow - List to keep track of all elements within the current row that the player is on  private List<GridElement> \_currentRowCorrects - List to keep track of the correct elements within the current row  private int \_currentRowNumber - Keeps track of current row  private int \_totalCorrects - Total number of correct elements in the grid  private int \_clickedCorrects - Total number of clicked correct elements in the grid  private bool \_getCorrects - Used for debouncing SetCurrentCorrects() coroutine  private bool \_doCorrectCheck - Used for debouncing CheckCorrects() coroutine  private TextMeshProUGUI \_text - Used to update the hint text |
| *Function* | *OnComplete() - IPuzzle interface method called when the associated puzzle is complete; Removes visualiser and updates text when complete*  *Start() - Setting the initial conditions of the grid*  *Update() - Sets the correct elements for the current row, checks for clicked correct elements and checks whether the entire puzzle is complete*  *SetCurrentCorrects() - Sets the correct elements in \_currentRowCorrects when executed*  *GoNext() - Progresses the player onto the next row*  *ResetGrid() - Resets the grid to the same state it was when the grid first spawns*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/2*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/2) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Grid object prefab* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | GridSpawner.cs |
| --- | --- |
| *Description* | *Responsible for physically spawning the grid of grid elements based on the entered parameters* |
| *Variable* | public GameObject gridElement - Object to be used as a singular element within the grid  public int lenY, lenX - Vertical and horizontal length of the grid  public float spaceX, spaceY - Spacing in Unity units between grid elements  public float rotX, rotY, rotZ - Rotation of the grid  private GameObject \_instantiatedObj - Used to keep track of the currently spawning gridElement  private List<GridElement> \_elements - List to keep track of all elements in the grid  public List<GridElement> AllElements{} - Read-Only accessor property for \_elements |
| *Function* | *Awake() - Spawns the grid row by row, left to right, bottom up, adds each element to the \_elements list before rotating the entire grid*  *FindElementByID(int id) - Iterates through the IDs of the elements in \_elements to return a singular element with a matching id*  *FindElementsInRow(int row) - Iterates through the provided row and returns all elements within that row as a list*  *FindElementsInColumn(int column) - Iterates through the provided column and returns all elements in that column as a list*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/2*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/2) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Grid object prefab* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | LockAnimationEvents.cs |
| --- | --- |
| *Description* | *Contains the methods used as animation events in the unlocking animation* |
| *Variable* | public Rigidbody lockRb - Rigidbody used for the lock falling when the event happens  public Animator cabinetAnim - Animator reference to trigger cabinet opening animation  private int \_openParam - Used to trigger the Open parameter specifically |
| *Function* | *Unlock() - Method called to trigger the lock falling and cabinet*  *TriggerCabinetAnim() - Method that triggers the cabinet opening animation*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/27*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/27) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Lock object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | LockDial.cs |
| --- | --- |
| *Description* | *Defines a single dial of the lock* |
| *Variable* | private int \_currentNumber - Current number that this particular lock dial is on  public int CurrentNumber{} - Accessor property for \_currentNumber that rotates the attached dial accordingly when setting the value of this property |
| *Function* | *Update() - Error proofing for if the \_currentNumber value is >10 or <0*  *SetNumber() - Method used for setting the current number and rotates the attached lock dial to the correct number*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/27*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/27) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Lock Dial components* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | LockInput.cs |
| --- | --- |
| *Description* | *Script used to handle the player’s input when holding the lock* |
| *Variable* | private LockDial[] \_lockDials - Array to contain all lockdials for the lock  private LockManager \_lockManager - LockManager reference  private LockDial \_currentDial - Reference to the current dial’s LockDial script  private Vector2 \_lThumbStickInput, \_rThumbStickInput - vars usd to keep track of each thumb stick’s input value  private int \_currentDialIndex - Used to keep track on the current lock dial in the lockdials array the player is on  private bool \_turnDial - Used to allow for dial to be turned only once per thumbstick movement  private bool \_changeDial - Used to allow for only one change in dial per thumbstick movement |
| *Function* | *Update() - Changes the currently selected lock dial based on the held controller’s thumbstick input, up and down for the next or previous number, left and right for the next or previous dial*  *UpdateCurrentDial() - Method to change the colour of the current dial before selecting the next dial*  *Normalise(float f) - Method to return 1 if f is >= 1, 0 if f=0 and -1 if f<1*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/27*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/27) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Lock object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | LockManager.cs |
| --- | --- |
| *Description* | *Script used to keep track of whether the player has correctly solved the lock* |
| *Variable* | public GameObject key - Used to teleport the key to the cabinet after lock has been solved  public LockDial[] lockDials - Array used to keep track of all lock dials  public Animator lockAnim - Animator reference to trigger unlock animation  public int correctCombination - Correct combination of the lock  public TextMeshProUGUI text - Used to change the hint text  private bool \_doCombinationCheck - Debounce used to repeat the combination check after the previous check is complete  private bool \_unlocked - Used to determine the current state of the lock  private Vector3 \_initialPos - Initial position of the lock  private Quaternion \_initialRot - Initial rotation of the lock  private int \_unlockAnim - Used to trigger the unlock animation specifically  public IPickable.Controller CurrentController {} - IPickable interface property used to determine the current controller grabbing the object, unused in this script  public bool Grabbed {} - IPickable interface property used to determine whether the object has been grabbed  public bool Completed {} - IPuzzle interface property used to determine the current puzzle has been completed  public bool RunOnComplete {} - IPuzzle interface property used to ensure OnComplete() runs only once |
| *Function* | *OnRelease() - IPickable interface method called when the object is released; Changes material of all dials back to white and resets the lock position to its original position if not completed*  *OnComplete() - IPuzzle interface method called when the associated puzzle is complete; Triggers the unlocking animation, spawns the key and updates the hint text*  *Awake() - Saving the initial position and rotation of the lock*  *Update() - Checks whether current entered combination is correct*  *CheckCombination() - Iterates through the lock dials and their current combination and compares it to the correct combination*  *TriggerLockAnimation() - Triggers the unlocking animation when called*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/27*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/27) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Lock object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | ButtonHandler.cs |
| --- | --- |
| *Description* | *Handles on-screen UI buttons for the start scene and end scene* |
| *Variable* | public GameObject pointerOrigin - Used for Raycasting  public Animator transition - Animator reference to play transition animation  private Ray \_pointerRay - Used for Raycasting  private RaycastHit \_hit - Stores the Raycast hit data  private GameObject \_hitObj - Object hit by the Raycast  private bool \_doRaycast - Performs Raycast when true  private float \_timer - Transition trigger |
| *Function* | *Update() - Changes \_doRaycast to true if the Right index trigger is pressed, if the button is hit, removes the “b, t, n” letters from the buttons to determine which scene to change to and changes scenes*  *FixedUpdate() - Performs the Raycast if \_doRaycast is true*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/105*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/105) |
| *Game Object attached to* | *What is the game object it is attached to?*  *ButtonHandler object, btnStartScene button* |
| *Author* | *Who created the script*  *Ryan* |

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| *Component Name* | EndSceneTimer.cs |
| --- | --- |
| *Description* | *Adds the player’s completion time to the end scene UI* |
| *Variable* | public TextMeshProUGUI txtTimer - Completion time text to be updated with the player’s completion time |
| *Function* | *Start() - Updates the completion time text to contain the player’s completion time and clears PlayerPrefs*  *LessThanTen() - Adds a “0” to the time if either the minutes or seconds value is <10*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/105*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/105) |
| *Game Object attached to* | *What is the game object it is attached to?*  *EndSceneTimer object* |
| *Author* | *Who created the script*  *Ryan* |

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| *Component Name* | EndSceneTransition.cs |
| --- | --- |
| *Description* | *Responsible for changing the scene to the End scene* |
| *Variable* | public Animator transition - Used to play the fade transition  public GameObject pointVisualiser - Used to show and hide the visualiser  private int \_completedPuzzles - Used to ascertain the number of completed puzzles |
| *Function* | *OnCollisionEnter() - If the player enters this object, checks for if the puzzles are all completed, changes the scene if so*  *LoadEndScene() - Triggers the transition animation and sets the visualiser to true before loading the end scene*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/102*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/102) |
| *Game Object attached to* | *What is the game object it is attached to?*  *EndSceneCollider object* |
| *Author* | *Who created the script*  *Ryan* |

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| *Component Name* | GameManager.cs |
| --- | --- |
| *Description* | *Responsible for the overall flow of the game and UI controls* |
| *Variable* | public GameObject[] puzzles - Array to contain all puzzles in the scene  public Animator uiAnimation - Animator reference to play the tutorial UI animation  public GameObject canvasHint - Used to hide/unhide the hint text  private bool \_runCheckCompletes - Debounce to check for completed puzzles |
| *Function* | *Awake() - Singleton design pattern*  *Update() - Constantly checks for completed puzzles when the previous check completed puzzles and handles UI hiding/unhiding controls*  *CheckCompletes() - Iterates through all elements in the puzzles array to check if the puzzles are completed and whether OnComplete() for those puzzles have already been run*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/40*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/40) |
| *Game Object attached to* | *What is the game object it is attached to?*  *GameManger object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | IPickable.cs |
| --- | --- |
| *Description* | *Interface for all grabbable objects* |
| *Variable* | enum Controller{} - Enum used to determine the implementing script’s held controller  bool Grabbed{} - Property used to determine whether the implementing game object is currently being grabbed  Controller CurrentController - Enum used to store the implementing script’s held controller |
| *Function* | *OnRelease() - IPickable interface method called when the object is released*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/142*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/142) |
| *Game Object attached to* | *What is the game object it is attached to?*  *None* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | IPuzzle.cs |
| --- | --- |
| *Description* | *Interface for all puzzles* |
| *Variable* | bool Completed - Boolean property used to determine whether the implementing puzzle has been completed  bool RunOnComplete - Boolean property used to ensure OnComplete is run only once |
| *Function* | *OnComplete() - IPuzzle interface method called when the associated puzzle is complete*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/39*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/39) |
| *Game Object attached to* | *What is the game object it is attached to?*  *None* |
| *Author* | *Who created the script*  *Ryan* |

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| *Component Name* | Timer.cs |
| --- | --- |
| *Description* | *Keeps track of the player’s play time in the App scene* |
| *Variable* | public TextMeshProUGUI txtTimer - Text reference used to change the timer text  private float \_minutes - float used to keep track of the elapsed minutes  private float \_seconds - float used to keep track of the elapsed seconds |
| *Function* | *Update() - Adds Time.deltaTime to \_seconds, increments \_minutes and resetting seconds to 0 if \_seconds surpasses 59, updates the timer text and sets the corresponding floats in PlayerPrefs*  *LessThanTen() - Returns the passed float with a ”0” appended if it is less than 10 as a string and returns the float itself as a string if it is greater than 10*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/138*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/138) |
| *Game Object attached to* | *What is the game object it is attached to?*  *TimerHandler object* |
| *Author* | *Who created the script*  *Ryan* |

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| *Component Name* | PickUpBehaviour.cs |
| --- | --- |
| *Description* | *Script responsible for all player’s physical movement within the screen* |
| *Variable* | public GameObject leftCon, leftAnchor - Left controller and its anchor for objects being picked up;  public GameObject rightCon, rightAnchor - Right controller and its anchor for objects being picked up  public float grabDistance - Distance before objects get parented to the anchor  private GameObject \_leftHandObj - Reference for object hit by the left hand’s Raycast  private Ray \_leftHandRay - Ray used for the left hand’s Raycast  private RaycastHit \_leftHandHit - Left hand Raycast data  private bool \_doLeftRaycast - Boolean used to run the left Raycast  private GameObject \_rightHandObj - Reference for object hit by the right hand’s Raycast  private Ray \_rightHandRay - Reference for object hit by the right hand’s Raycast  private RaycastHit \_rightHandHit - Ray used for the right hand’s Raycast  private bool \_doRightRaycast - Boolean used to run the right Raycast |
| *Function* | *Update() - When the hand triggers of the controllers are pressed, sets the corresponding boolean to true to do a Raycast, if the respective object is not null, sets the values in their corresponding script using their IPickable interface, resets the values and calls the IPickable interface’s OnRelease() method when the object is released*  *FixedUpdate() - Runs the corresponding Raycast when the appropriate booleans are set to true, setting their respective objects if the Rays hit*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/24*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/24) |
| *Game Object attached to* | *What is the game object it is attached to?*  *PickUpBehaviour object* |
| *Author* | *Who created the script*  *Ryan* |

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| *Component Name* | PlayerMovement.cs |
| --- | --- |
| *Description* | *Responsible for the player’s physical movement around the scene* |
| *Variable* | public GameObject centerEyeAnchor - Center eye reference to access player direction  public float speed - Player’s movement speed  public float maxSpeed - Maximum speed the player can reach  private Rigidbody \_rb - Player’s Rigidbody  private Vector2 \_stickInput - Left controller’s stick input  private static bool \_isMoving - Static boolean to access the current state of the player |
| *Function* | *Start() - Get the Rigidbody attached to the player*  *Update() - When the left trigger is held down, \_isMoving is set to true and we move the player by adding an instantaneous force in the direction of the stick being pushed down, relative to the center eye’s direction*  *Detailed documentation:* [*https://github.com/RotX18/MP\_Group4\_EscapingReality/issues/84*](https://github.com/RotX18/MP_Group4_EscapingReality/issues/84) |
| *Game Object attached to* | *What is the game object it is attached to?*  *Player object* |
| *Author* | *Who created the script*  *Ryan* |

| *Component Name* | SphereMovement.cs |
| --- | --- |
| *Description* | *Responsible for the ball’s physical movement around the scene* |
| *Variable* | public maxSpeed - Highest speed the ball can reach  public maxAcceleration - The max rate the which the ball can reach the maxSpeed  private Vector2 playerInput - the input buttons for the movement  private velocity - the initial velocity of the ball  private desiredVelocity - the final Velocity ball wants to reach  private body - Ball’s Rigidbody |
| *Function* | *Awake() - Get the rigidbody attached to the ball*  *Update() - Detect player’s input and put it in a Vector2*  *FixedUpdate() - Change the velocity using the Vector2*  *Detailed documentation:* |
| *Game Object attached to* | *What is the game object it is attached to?*  *Sphere* |
| *Author* | *Who created the script*  *Stanley* |

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| *Component Name* | MazeCompleted.cs |
| --- | --- |
| *Description* | *Responsible for checking if player has completed the maze* |
| *Variable* | public GameObject maze  private GameObject \_ballObj  private GameObject \_battery  private GameObject \_battSpawner  private TextMeshProUGUI \_text |
| *Function* | *OnComplete() - change text and update battery when completed*  *OnTriggerEnter() - Check that the puzzle is completed*  *Detailed documentation:* |
| *Game Object attached to* | *What is the game object it is attached to?*  *ColliderCheck* |
| *Author* | *Who created the script*  *Stanley, Ryan* |

# Game Objects

List all the game objects in the game.  
For each game object list the following information  
- Object Description  
- Which scene is it in  
- Which other game objects it contains  
- What components it contain

| Name | Directional Light |
| --- | --- |
| Description | Gameobject contains lighting for the first scene |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | Transform, Light |

| Name | EventSystem |
| --- | --- |
| Description | Handles the UI events |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | Transform, Event System, Standalone Input Module |

| Name | Canvas |
| --- | --- |
| Description | The canvas gameobject contains the objects that show this screen. |
| Which scene it is in | StartScene |
| Child game objects | Panel |
| Components | Rect Transform, Canvas, Canvas Scaler, Graphic Raycaster |

| Name | Panel |
| --- | --- |
| Description | Is a child of the Canvas gameobject and holds the background image |
| Which scene it is in | StartScene |
| Child game objects | Title, Instructions, btnApp |
| Components | Rect Transform, Canvas Renderer, Image |

| Name | Title |
| --- | --- |
| Description | Contains the text “Escaping Reality” |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | Rect Transform, Canvas Renderer, TextMeshPro - Text |

| Name | Instructions |
| --- | --- |
| Description | Contains the text “Objective: Complete Puzzles find a key to escape the room” |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | Rect Transform, Canvas Renderer, TextMeshPro - Text |

| Name | btnApp |
| --- | --- |
| Description | Button collider to click on |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | Rect Transform, Canvas Renderer, Image, Button, Box Collider |

| Name | Player |
| --- | --- |
| Description | The player gameobject that contains all gameobjects and components in relation to the player |
| Which scene it is in | StartScene |
| Child game objects | OVRCameraRig |
| Components | Transform, Player Movement, Rigidbody, Capsule Collider |

| Name | OVRCameraRig |
| --- | --- |
| Description | This is the camera rig for the player. |
| Which scene it is in | StartScene |
| Child game objects | TrackingSpace |
| Components | Transform, OVRCameraRig, OVRManager |

| Name | TrackingSpace |
| --- | --- |
| Description | This is the gameobject that is a child of OVRCameraRig. |
| Which scene it is in | StartScene |
| Child game objects | LeftEyeAnchor, CenterEyeAnchor, RightEyeAnchor,  TrackerAnchor, LeftHandAnchor, RightHandAnchor |
| Components | Transform |

| Name | RightPointVisualiser |
| --- | --- |
| Description | This visualiser is the line that appears on the player right hand |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | OVR Pointer Visualizer, Line Renderer |

| Name | ButtonHandler |
| --- | --- |
| Description | This object handles the button that the player clicks to go to the next scene |
| Which scene it is in | StartSceme |
| Child game objects | None |
| Components | Transform, ButtonHandler |

| Name | AudioSource |
| --- | --- |
| Description | Audio Ambience that does background music |
| Which scene it is in | StartScene |
| Child game objects | None |
| Components | Transform, Audio Source, Audio Handler |

| Name | Lighting |
| --- | --- |
| Description | Contains all the lighting objects and post processing |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform |

| Name | Interior Light |
| --- | --- |
| Description | The light that shines the room interior |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Light |

| Name | Window Light |
| --- | --- |
| Description | The light that shines from outside the window to inside the room |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Light |

| Name | Light Probe Group |
| --- | --- |
| Description | Creates dynamic lightning on dynamic objects |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Light Probe Group |

| Name | Reflection Probe |
| --- | --- |
| Description | Allows reflection on objects to add shine to object such as the floor and cabinet. |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Reflection Probe |

| Name | PostProcessing |
| --- | --- |
| Description | Handles the look of the environment such as making it brighter or mono color |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Volume |

| Name | Player |
| --- | --- |
| Description | The player gameobject that contains all gameobjects and components in relation to the player |
| Which scene it is in | App |
| Child game objects | OVRCameraRig |
| Components | Transform, Player Movement, Rigidbody, Capsule Collider |

| Name | OVRCameraRig |
| --- | --- |
| Description | This is the camera rig for the player. |
| Which scene it is in | App |
| Child game objects | TrackingSpace |
| Components | Transform, OVRCameraRig, OVRManager |

| Name | TrackingSpace |
| --- | --- |
| Description | This is the gameobject that is a child of OVRCameraRig. |
| Which scene it is in | App |
| Child game objects | LeftEyeAnchor, CenterEyeAnchor, RightEyeAnchor,  TrackerAnchor, LeftHandAnchor, RightHandAnchor |
| Components | Transform |

| Name | Environment |
| --- | --- |
| Description | Contains environment gameobjects such as models and UI |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform |

| Name | Drawer |
| --- | --- |
| Description | Drawer gameobject prefab |
| Which scene it is in | App |
| Child game objects | drawer |
| Components | Transform |

| Name | Pillow |
| --- | --- |
| Description | Pillow gameobject prefab |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Pillow, Rigidbody, Box Collider |

| Name | Vase |
| --- | --- |
| Description | Vase gameobject prefab |
| Which scene it is in | App |
| Child game objects | vase |
| Components | Transform |

| Name | Floor |
| --- | --- |
| Description | The platform the player walks on |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Mesh Renderer, Mesh Collider |

| Name | Walls |
| --- | --- |
| Description | Contain of Unity Cubes that make up the walls |
| Which scene it is in | App |
| Child game objects | Cubes, Canvas UI |
| Components | Transform |

| Name | Canvas UI |
| --- | --- |
| Description | Contain the main UI instruction such as controls |
| Which scene it is in | App |
| Child game objects | Image, Text |
| Components | Rect Transform, Canvas, Canvas Scaler, Graphic Raycaster, Animator |

| Name | Window |
| --- | --- |
| Description | Window gameobject prefab |
| Which scene it is in | App |
| Child game objects | Cube, Cube.001 |
| Components | Transform |

| Name | Shelf |
| --- | --- |
| Description | A unity cube to hold the clocks |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Mesh Collider, Box Collider |

| Name | Table |
| --- | --- |
| Description | Table gameobject prefab |
| Which scene it is in | App |
| Child game objects | table |
| Components | transform |

| Name | Clocks |
| --- | --- |
| Description | Contains all the clocks in the Scene |
| Which scene it is in | App |
| Child game objects | TableClock Type3 |
| Components | Transform |

| Name | TableClock Type3 |
| --- | --- |
| Description | It is a unity asset clock |
| Which scene it is in | App |
| Child game objects | Material select SWITCH, Simple Digital Clock Minutes, COLLIDER |
| Components | Transform, Options Display, Clock Timer |

| Name | Cabinet |
| --- | --- |
| Description | Cabinet gameobject prefab |
| Which scene it is in | App |
| Child game objects | cabinet |
| Components | Transform |

| Name | DoornKey |
| --- | --- |
| Description | Contain the door and key objects for animation |
| Which scene it is in | App |
| Child game objects | Door, AnimationKey |
| Components | Transform, Animator |

| Name | EndSceneCollider |
| --- | --- |
| Description | A unity cube that will detect if the player has left the room |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Mesh Renderer, Box Collider, End Scene Transition |

| Name | BatteryHolder\_NoBatt |
| --- | --- |
| Description | The batteryholder gameobject prefab without the battery |
| Which scene it is in | App |
| Child game objects | BattSocket |
| Components | Transform, Box Collider, Clock Activator |

| Name | pointintarrow |
| --- | --- |
| Description | An arrow that shows the helps the player in game |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Mesh Renderer |

| Name | Square Rug |
| --- | --- |
| Description | A Rug on the floor to add ambience to the room |
| Which scene it is in | App |
| Child game objects | select Rug Atlas |
| Components | Transform, Options Display |

| Name | High building 2 |
| --- | --- |
| Description | A building outside the window from unity asset store |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform |

| Name | shelf |
| --- | --- |
| Description | A shelf gameobject prefab |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Mesh Renderer |

| Name | Light |
| --- | --- |
| Description | Ceiling light prefab gameobject |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Mesh Renderer |

| Name | vase\_w\_plant |
| --- | --- |
| Description | Vase with plant gameobject prefab |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform |

| Name | Timer |
| --- | --- |
| Description | This is gameobject is for the timer UI |
| Which scene it is in | App |
| Child game objects | Panel |
| Components | Transform, Canvas, Canvas Scaler, Graphic Raycaster |

| Name | Panel |
| --- | --- |
| Description | This panel is the child of the timer, containing a text object for the timer. |
| Which scene it is in | App |
| Child game objects | Text |
| Components | Transform, Rect Transform, Canvas Renderer, Image |

| Name | Puzzle |
| --- | --- |
| Description | Contains all puzzle related object |
| Which scene it is in | App |
| Child game objects | BallPuzzle, BatterySpawner, Battery, Grid, Lock, PlayerKey |
| Components | Transform |

| Name | BallPuzzle |
| --- | --- |
| Description | The ballpuzzle gameobjects |
| Which scene it is in | App |
| Child game objects | Wall, Cube, ColliderCheck |
| Components | Transform, Box Collider |

| Name | BatterySpawner |
| --- | --- |
| Description | The position at which the battery will spawn |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform |

| Name | Battery |
| --- | --- |
| Description | The battery gameobject prefab |
| Which scene it is in | App |
| Child game objects | battery |
| Components | Transform, Rigidbody, Battery, Capsule Collider |

| Name | Grid |
| --- | --- |
| Description | Grid gameobject that has components regarding spawning the grid |
| Which scene it is in | App |
| Child game objects | GridSpawner, GridManager, InputHandler |
| Components | Transform |

| Name | GridSpawner |
| --- | --- |
| Description | GridSpawner gameobject that spawns the grid according to length and width |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Grid Spawner |

| Name | GridManager |
| --- | --- |
| Description | GridManager gameobject that detects the correct collision to complete this puzzle |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, GridManager |

| Name | Input Handler |
| --- | --- |
| Description | Grid gameobject that has handles input |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Grid Input |

| Name | Lock |
| --- | --- |
| Description | The lock gameobject prefab |
| Which scene it is in | App |
| Child game objects | NumberLock, InputManager |
| Components | Transform, Box Collider, Lock Manager, Rigidbody |

| Name | PlayerKey |
| --- | --- |
| Description | The key gameobject prefab |
| Which scene it is in | App |
| Child game objects | key |
| Components | Transform, Rigidbody, Box Collider |

| Name | Scripts |
| --- | --- |
| Description | Script gameobject containing gameobject that has relevant scripts |
| Which scene it is in | App |
| Child game objects | \_FurnitureDisplayTexture, RightPointVisualiser, GameManager, PickUpBehaviour, Timer |
| Components | Transform |

| Name | \_FurnotureDisplayTexture |
| --- | --- |
| Description | Contains scripts for Unity asset |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Options Display Save Var |

| Name | RightPointVisualizer |
| --- | --- |
| Description | The ray that comes out of the right hand |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, OVRPointerVisualiser |

| Name | GameManager |
| --- | --- |
| Description | Gameobject gamemanger |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, GameManager |

| Name | PickUpBehaviour |
| --- | --- |
| Description | Gameobject with scripting for player to pick up objects |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, PickUpBehavior |

| Name | Timer |
| --- | --- |
| Description | Gameobject with timer script to update the timer UI |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform, Timer |

| Name | EventSystem |
| --- | --- |
| Description | Handle UI events |
| Which scene it is in | App |
| Child game objects | None |
| Components | Transform EventSystem. StandaloneInputModule |

| Name | Directional Light |
| --- | --- |
| Description | Lightning for the end scene |
| Which scene it is in | EndScene |
| Child game objects | None |
| Components | Transform, Light |

| Name | Particles |
| --- | --- |
| Description | Contains all the particles gameobject |
| Which scene it is in | EndScene |
| Child game objects | Particle Systems |
| Components | Transform |

| Name | Particle System |
| --- | --- |
| Description | The particle gameobjects to let player feel accomplished |
| Which scene it is in | EndScene |
| Child game objects | None |
| Components | Transform, Particle System |

| Name | Canvas |
| --- | --- |
| Description | Canvas holds the panel gameobject |
| Which scene it is in | EndScene |
| Child game objects | Panel, EventSystem |
| Components | Rect Transform, Canvas, Canvas Scaler |

| Name | Panel |
| --- | --- |
| Description | Has gameobjects showcasing the final UI |
| Which scene it is in | EndScene |
| Child game objects | None |
| Components | Rect Transform, Image |

| Name | EventSystem |
| --- | --- |
| Description | Handles the UI events |
| Which scene it is in | EndScene |
| Child game objects | None |
| Components | Transform, Event System, Standalone Input Module |

| Name | Player |
| --- | --- |
| Description | The player gameobject that contains all gameobjects and components in relation to the player |
| Which scene it is in | EndScene |
| Child game objects | OVRCameraRig |
| Components | Transform, Player Movement, Rigidbody, Capsule Collider |

| Name | OVRCameraRig |
| --- | --- |
| Description | This is the camera rig for the player. |
| Which scene it is in | EndScene |
| Child game objects | TrackingSpace |
| Components | Transform, OVRCameraRig, OVRManager |

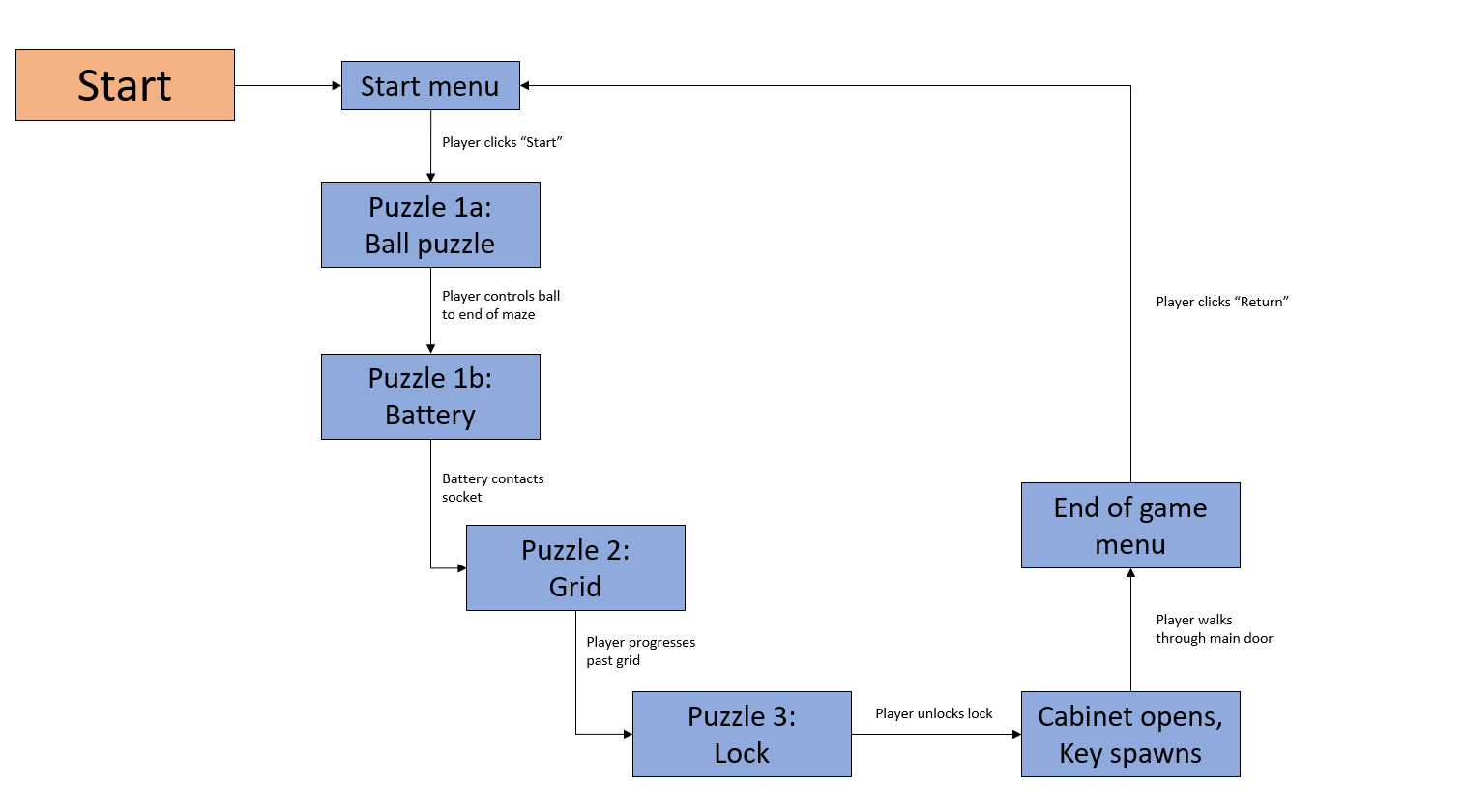
| Name | TrackingSpace |
| --- | --- |
| Description | This is the gameobject that is a child of OVRCameraRig. |
| Which scene it is in | EndScene |
| Child game objects | LeftEyeAnchor, CenterEyeAnchor, RightEyeAnchor,  TrackerAnchor, LeftHandAnchor, RightHandAnchor |
| Components | Transform |

| Name | RightPointVisualiser |
| --- | --- |
| Description | This visualiser is the line that appears on the player right hand |
| Which scene it is in | EndScene |
| Child game objects | None |
| Components | Transform, OVR Pointer Visualiser |

| Name | EndSceneTimer |
| --- | --- |
| Description | Gameobject that shows the timer |
| Which scene it is in | EndScene |
| Child game objects | None |
| Components | Transform, End Scene Timer |

# Game Flow

## Flow Chart Diagram



# Development information

## Library

Lists all external library that you have use. What the licensing agreement and where is the source

## Version of software

Lists all the software and its version used to develop this game. For example which Unity version is being used etc

Editor:

* Unity Editor: 2021.3.5f1

Unity Asset Store Assets:

* Low poly city from Viuletti - Version 1.0 - Feb 12, 2019 (<https://assetstore.unity.com/packages/3d/environments/urban/low-poly-city-from-viuletti-132536>)
* Customizable Bedroom - Version 1.0 - Oct 13, 2016 (<https://assetstore.unity.com/packages/3d/props/furniture/customizable-bedroom-72562#releases>)

Packages:

* Oculus XR Plugin: Version 3.0.2 - June 08, 2022
* MockHMD XR Plugin: Version 1.3.0-preview.1 - February 14, 2021
* TextMeshPro: Version 3.0.6 - April 22, 2021
* Timeline: Version 1.6.4 - January 27, 2022
* Unity UI: Version 1.0.0 - June 14, 2022
* Universal RP: Version 12.1.7 - June 14, 2022
* Version Control: Version 1.15.18 - May 23, 2022
* Visual Scripting: Version 1.7.8 - May 10, 2022
* Visual Studio Code Editor: Version 1.2.5 - February 09, 2022
* Visual Studio Editor: Version 2.0.15 - March 29, 2022

## Hardware requirement

CPU: Intel(R) Core(TM) i7-9750H

GPU: NVIDIA GeForce GTX 1650

RAM: 16GB DDR4

ADDITIONAL APPARATUS:

* Oculus Rift S
* Oculus Touch Controllers
* DP - Mini DP adapter

## Setup of development platform

## Detailed instruction on how to setup the development platform.

1. Download and install Unity Hub

2. In Unity Hub, go to Installs>Install Editor> (Install any editor 2021.3.5f1 or later)

3. Download the Unity project from GitHub (https://github.com/RotX18/MP\_Group4\_EscapingReality) by clicking on Code > Download ZIP

4. Extract the sourcecode file (MP\_Group4\_EscapingReality\_SOURCECODE)

5. Using Unity Hub, click Projects > Open and open the source code file

6. Ensure the following assets and packages are installed and present:

Assets:

- Low poly city from Viuletti - Version 1.0 - Feb 12, 2019 (<https://assetstore.unity.com/packages/3d/environments/urban/low-poly-city-from-viuletti-132536>)

- Customizable Bedroom - Version 1.0 - Oct 13, 2016 (<https://assetstore.unity.com/packages/3d/props/furniture/customizable-bedroom-72562#releases>)

If any assets are missing, they can be downloaded from the links above. Add the assets to your asset list and import them by going to Window > Package Manager > Packages: My Assets > Import

Packages:

- Oculus XR Plugin: Version 3.0.2 - June 08, 2022

- MockHMD XR Plugin: Version 1.3.0-preview.1 - February 14, 2021

- TextMeshPro: Version 3.0.6 - April 22, 2021

- Timeline: Version 1.6.4 - January 27, 2022

- Unity UI: Version 1.0.0 - June 14, 2022

- Universal RP: Version 12.1.7 - June 14, 2022

- Version Control: Version 1.15.18 - May 23, 2022

- Visual Scripting: Version 1.7.8 - May 10, 2022

- Visual Studio Code Editor: Version 1.2.5 - February 09, 2022

- Visual Studio Editor: Version 2.0.15 - March 29, 2022

If any packages are missing, they can be download by going to Window > Package Manager > Packages: Unity Registry and searching for and downloading them separately

7. Download and install the Oculus app (for Oculus Rift S) from https://store.facebook.com/quest/setup/

8. Launch the Oculus app and follow the instructions in the app to setup the headset

9. After setting up the headset, open the Unity Editor and go to Edit > ProjectSettings > XR Plug-in Management

10. Enable Oculus in the Plug-in Providers section

11. After doing the above steps, the project is now set up and ready for development

**APPENDIX: Code base location**

*MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Audio*

* AudioHandler.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Battery*

* Battery.cs
* ClockActivator.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Door*

* DoorLock.cs
* Key.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Grid*

* GridElement.cs
* GridInput.cs
* GridManager.cs
* GridSpawner.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Lock*

* LockAnimationEvents.cs
* LockDial.cs
* LockInput.cs
* LockManager.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Misc*

* ButtonHandler.cs
* EndSceneTimer.cs
* EndSceneTransition
* GameManager.cs
* IPickable.cs
* IPuzzle.cs
* Pillow.cs
* Timer.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\Player*

* PickUpBehaviour.cs
* PlayerMovement.cs

*D:\GitHub\MP\_Group4\_EscapingReality\MP\_Group4\_EscapingReality\_SOURCECODE\Assets\Res\Scripts\SphereMovement*

* MazeCompleted.cs
* SphereMovement.cs