SFWRENG 4GP6: Software Design IV
Capstone Computer Game Design Project
Design Document

Roygbiv

Gameboys

Kareem Abdelmesih - 1407633
Victoria Graff - 1401451
Puru Jetly - 1417837
Viraj Patel - 1429286
Rehan Theiveehathasan - 1416031

5 March 2018

How does the camera system work? Is it perspective or orthogonal? Are there multiple cameras? Does the camera follow the player? How does it do that (algorithm)? Can the player control the camera? If so, how?

There is one perspective camera following the character. The player has the option to either control the rotation of the camera through their mouse or lock the camera rotation to the direction that they are travelling in. This can be altered in the settings menu. The camera model is borrowed from: https://assetstore.unity.com/packages/templates/third-person-controller-basic-locomotion-free-82048

When dealing with player movement state which keys will be mapped to which movement direction. Are you using Unity's standard assets for movement controls? Are the controls configurable? How fast will the player move? Is there a lead-time before movement begins? Does movement ramp-up or does the player start at maximum speed? Can the player move in the air? etc.

Movement keys: W (forward), A (left), S (backward), D (right) and arrow keys accordingly.
The mouse is used for player and camera orientation (if the player did not choose to lock the camera as mentioned in the question above).
These keys are not configurable, but selected to provide the player with options to accommodate their ambidexterity.

The movement model is not Unity's standard, but borrowed from: https://assetstore.unity.com/packages/templates/third-person-controller-basic-locomotion-free-82048

There are two speeds in which the player can move around the world; walking and running, with no lead-time before the movement begins. Pressing the movement keys will initiate walking, and holding down any of the Shift keys while holding down a movement key will initiate running. However, the player cannot run for an endless amount of time. Stamina will only allow the player to sprint for short bursts of at most seven seconds, when their stamina is full. This is similar to that in the Grand Theft Auto games where the player gets tired from running for too long. The player would then have to stop running in order to regain their stamina. It can be fully regained after not running for seven seconds, with an even spread, where after a second they regain one seventh of the total stamina, after two seconds they regain two sevenths of the total stamina, and so on until seven seconds. They can use whatever amount is regained (which is not shown to the player; more of a background mechanic). Lastly, the player cannot move while in the air.

How do players interact with other players/NPCs/objects/enemies? How far away should they be? Do they need to press a specific button or is it automatic once within a given range? What are the specific types of interactions possible and how do they work?

The player can interact with all other objects through direct collisions. The player does not have to press anything. Whether it be a sphere, collectible or platform, that is the only method of interaction, exhibited through their collider boxes. For spheres, they bounce back in the opposite direction with a reflected velocity. For collectibles, they disappear once collected. One special case exists specifically for automated doors, in which the player must be within three game units for them to open/close. This is borrowed from: https://assetstore.unity.com/packages/templates/third-person-controller-basic-locomotion-free-82048

Can the player see the whole map from the beginning or is it obscured? How do they reveal more of it? How do they look at it? Does the game pause while they look at it? What is shown on the map?

The player can only see the sections in which they navigate to. However, there is a mini-map in the top left corner of the screen that displays a simple overview of the whole map. This is to show the player where they can go in a level. The mini-map has little detail; just enough so that the player is not deluded as to where to go. The player can see the mini-map throughout all level. When the player pauses, the pause menu appears and takes up most of the game screen.

For saving/loading the game, where does it save? Can it be customized? How does loading work? Are there limited save slots? Does the game autosave? Are there checkpoints and how do they work?

Saving/loading will be achieved through Unity's PlayerPrefs. This will include saved settings as well as levels unlocked and high-scores. All saved data is loaded when the game is started. This implies that there exists only one slot for saving, which can be reset through the game settings. The game auto-saves whenever the player beats a new level, a high score or changes any of the settings. The player does not have an option to save manually.

What does "pausing" the game do? What will the player see when it's paused? What do your menus look like? Will the game continue playing in the background (ex. GoldenEye 64 watch system), or will it freeze?

Pausing the game completely freezes the gameplay, including all physical objects within the level that is being played. The pause menu appears and takes up most of the game screen. The pause menu is discussed in one of the questions below regarding menus. In addition, pausing the game maintains all properties of the present objects, in the sense that if a sphere was moving in a specific direction at a specific speed before pausing, its movement will be resumed exactly as it should, as if the game was not paused, when the player resumes the game.

When changing game settings, will the changes apply immediately or will they require the game to be restarted? Are the changes persistent? How? What settings can be changed?

The changes apply immediately after the player changes them. The user is able to adjust the volume of the music and sound effects separately as well as mute them. The player is also able to invert the axis in which the mouse controls (player and camera), along with their sensitivity. The player also has the option to lock/unlock the camera movement as mentioned before. The changes are persistent. Though the game may be exited, they remain until changed again. The player is given an option to reset all settings to the default settings as well as reset the whole game which includes unlocked levels and high scores.

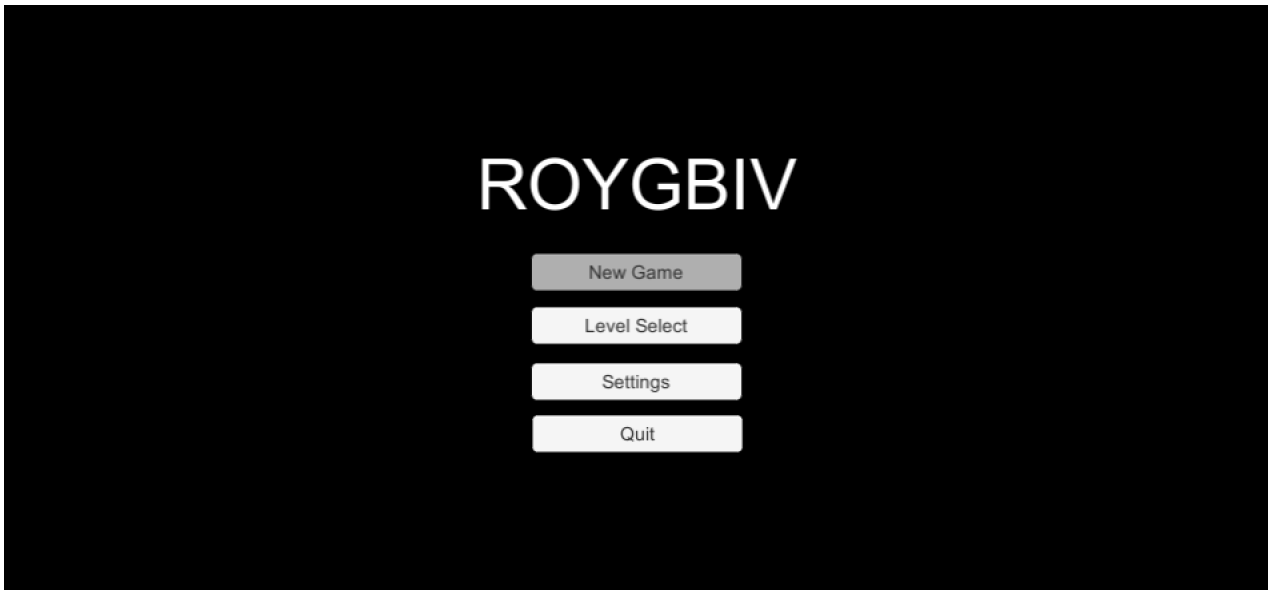
Can the player soft-lock the game and be forced to restart? How? Can you guarantee this won't happen? How?

The game can only be soft-locked within levels, if a sphere that it not yet tagged physically disappears from the level. This is because the player will not be able to proceed when it is time to tag that lost sphere. To prevent that, invisible surrounding planes are placed around the premises of all levels that are open (without borders) to encompass all spheres. Therefore, the player cannot soft-lock the game and be forced to restart.

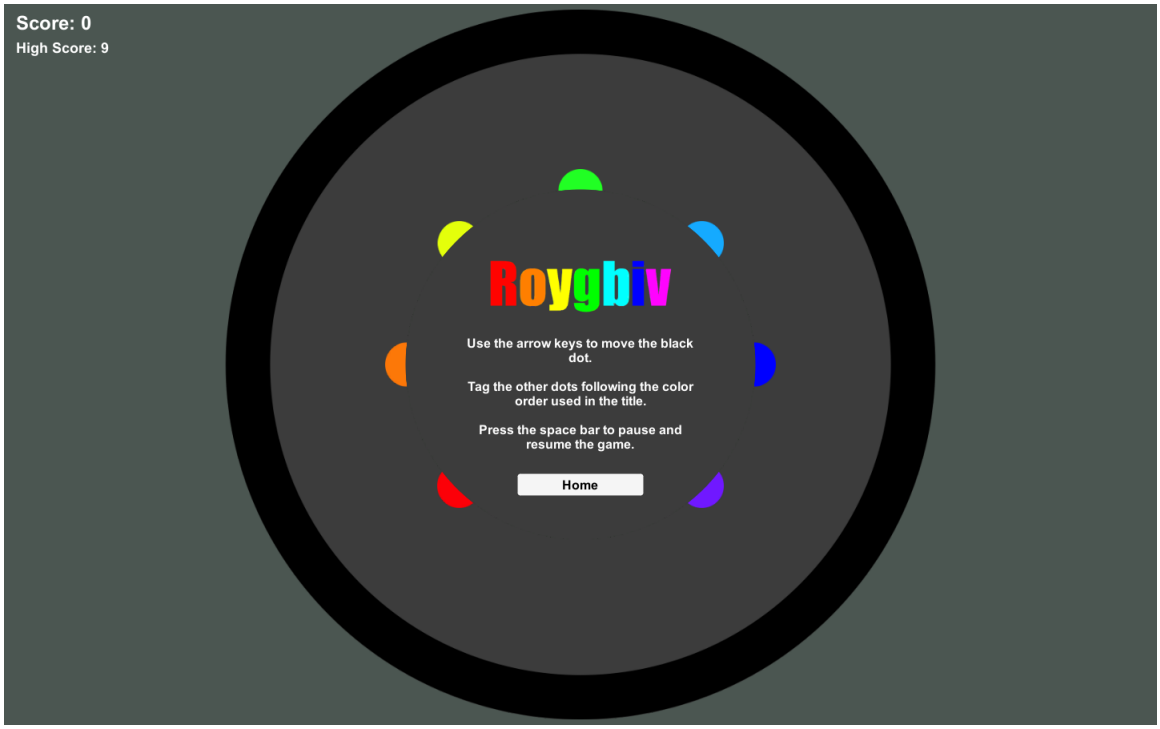
What do your menus look like? What options are available to the player? How many menus are there? Is there a level-select screen?

There exists two major menus in the game. The main menu which provides the player with options to play through a modified arcade-type level, select a specific level, view the instructions or change settings. Each of those is mapped to its own individual button. The pause menu contains the ROYGBIV logo, each letter colored accordingly, and that is to aid the player in case they had forgotten which sphere is to be tagged next. It also contains buttons for resuming the game, viewing the instructions and exiting to home.

Here's a basic concept of what the main menu will look like:



Here's a 2D example of what the pause menu will look like:



How does a player "die"/fail a level? Is it from health=0, falling off screen, getting stuck, etc? What happens when they do? How do they continue?

All levels have the same terminate condition. The player's health can only be 0, 1 or 2 at any point in a level. If the player comes in contact with a sphere that should not be tagged at that current moment, their health decreases by 1, and if the player's health reaches 0, they fail the level. The player starts with a health of 1. It can then be increased to 2 if they pick (touch) a shield collectible up, and it will stay at 2 until the player comes in contact with a sphere that should not be tagged at that current moment, which will decrease it to 1 as mentioned before. If the player picks another shield collectible up while already possessing one, it will have no effect.

How does a player beat a boss, level, etc.? Be specific for each type of boss, level, etc.

All levels have the same win condition. The player must tag each of the seven colored spheres present in a level in the following order: red, orange, yellow, green, blue, indigo and violet. Upon tagging the final violet sphere, the player beats the level.

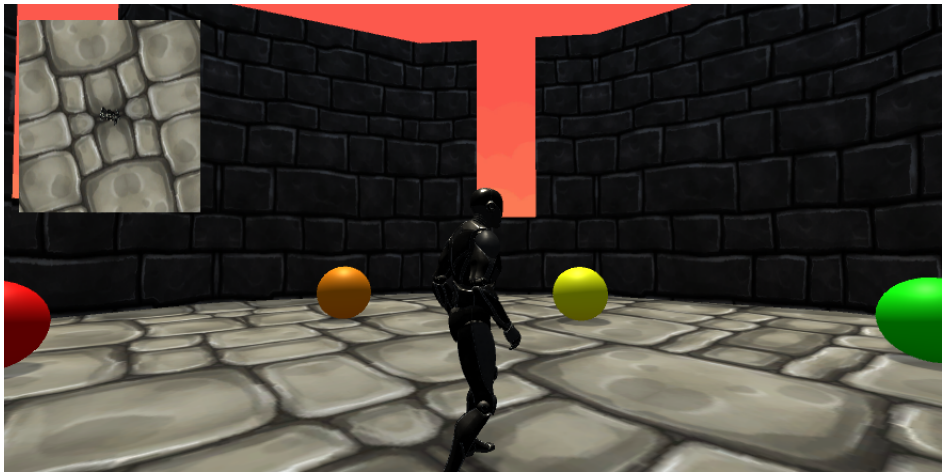
For powerups, can they stack? How many powerups can a player use simultaneously? What categories of powerups do you have (ex. damage boosting, healing)? What powerups belong to each category? How does each powerup work (list them all and describe them)? How does a player pick up a powerup (do they need to be within a certain range? Do they need to press a button)?

There is one collectible and that is a shield-type collectible. They can be picked up by tagging them, the same way that a sphere is tagged. Once tagged, the shield is instantly equipped and remains for either seven seconds or until the player tags an incorrect sphere. The player's color changes to green through the duration that the shield is equipped. These collectibles cannot stack in the sense that if the player picks up two then they would have fourteen seconds, rather only seven seconds from when the last shield has been picked up.

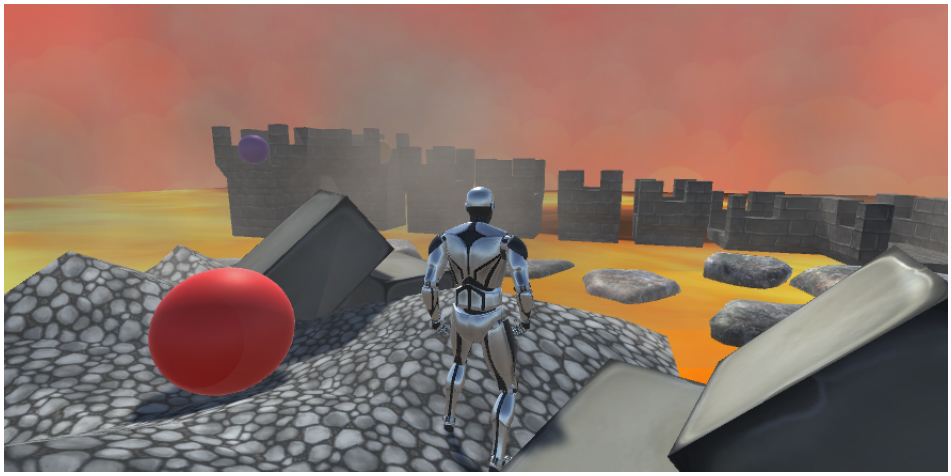
What do your levels look like? What are the puzzles/obstacles/enemies in each? What is the goal of each level? Are they all the same or different? How does the story progress between levels? For each puzzle, how is a player expected to solve it? Are there multiple solutions?

There are seven levels. Each level is themed based on one unique colour of the rainbow. This embraces the fact that each level is its own planet, based on the different unique colors. The same goal remains for each level. That is to tag each sphere according to its colors in the order that it appears in the rainbow, and the level is complete once tagged the final violet sphere in the correct order. The methods to get to each sphere varies based on each level. That is, for the orange level (level two), for example, lava is present and the player must avoid touching it. Lava is arguably orange, hence why it is the main element in that level. On the other hand, the green level (level four) takes place in a green forest. That is how each level remains unique. There could be multiple ways to get to a sphere, but only one way to win the level as mentioned before. As the player progresses through the levels, they get harder, whether it be a longer jump that they have to make or a smaller enclosed area that they have to navigate.

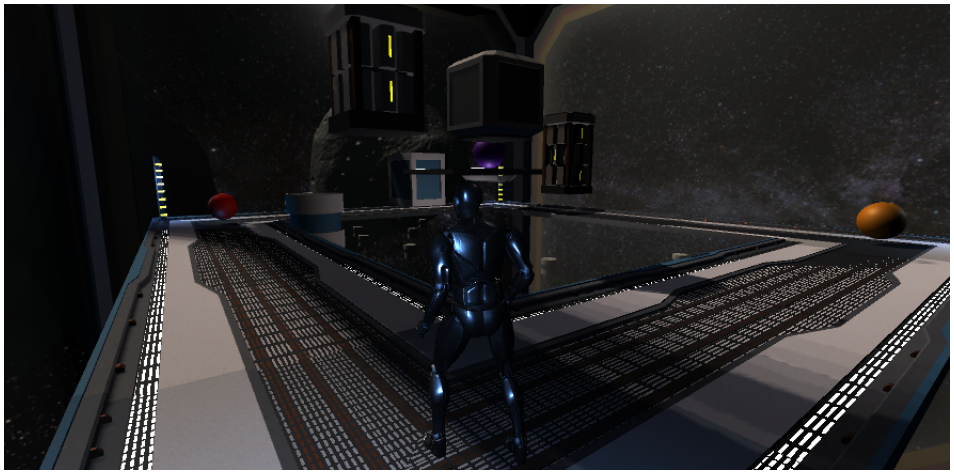
Level one acts as an introductory level due its simplicity. It is a simple enclosed round arena on the red planet that the player gets to learn the mechanics at their own pace, which are covered in the instructions menu, given that it is not a guided tutorial. Here's a basic concept of what level one will look like:



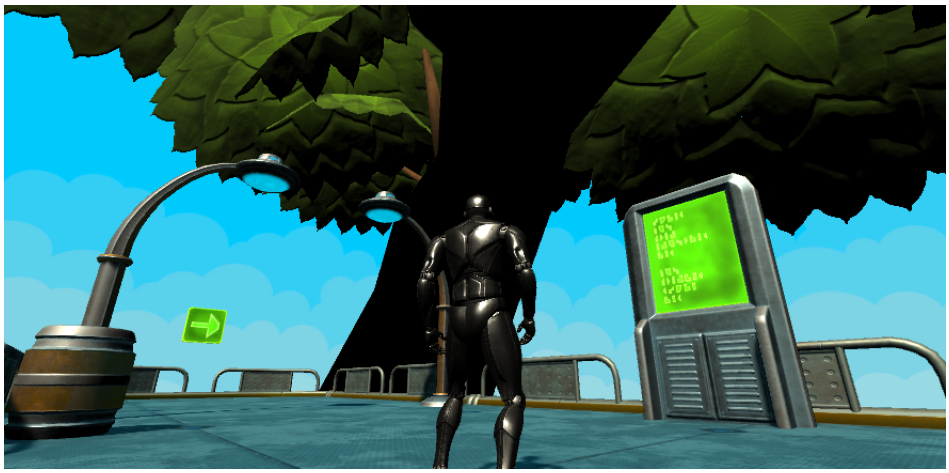
Level two takes place on the orange planet and contains lava that instantly kills the player upon physical contact, therefore they must navigate their way from one rock to another through careful jumping to succeed. Here's a basic concept of what level two will look like:



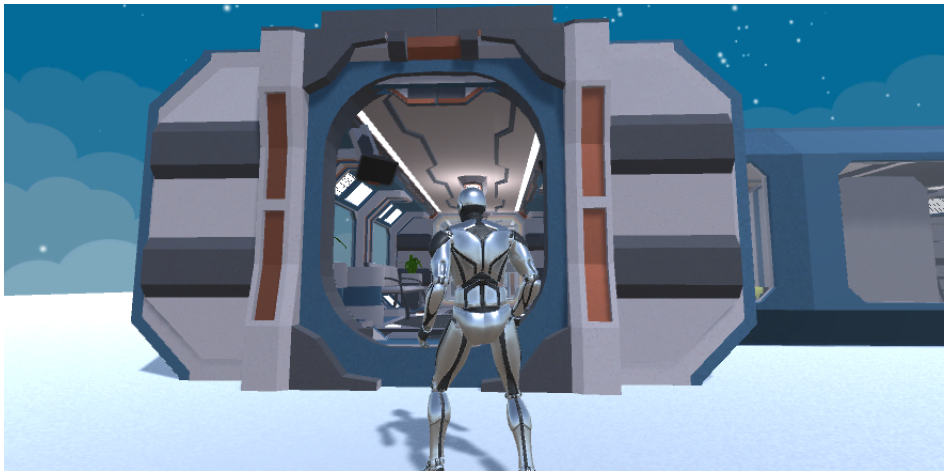
Level three takes place in a multi-storey building on the yellow planet. Since level two introduced the movement mechanics and the challenges that come with them, this level serves to introduce the other type of challenges and that is to locate some hidden spheres within the level. Here's a basic concept of what level three will look like:



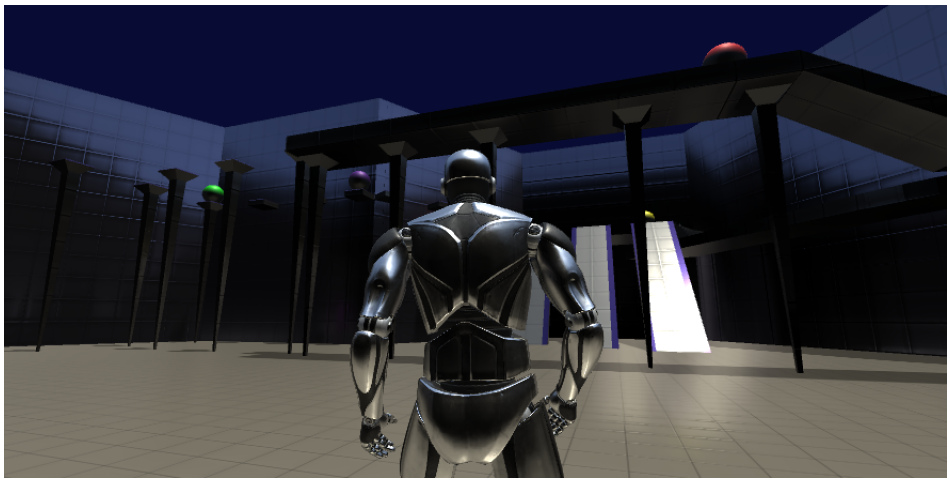
Level four takes place in a forest on the green planet in which there are flying platforms that rotate around a large tree that is in the center of the level. The player must jump from one platform to another to reach their goal. Here's a basic concept of what level four will look like:



Level five takes place on the blue snowy planet where the player finds a futuristic building that seems to be someone's working laboratory. Similar to level three, one of the main challenges in this level is to locate the spheres as one of them is hidden. The other challenge is navigating through narrow corridors and doorways while avoiding spheres that should not be tagged. Here's a basic concept of what level five will look like:



Level six takes place in an over-reflective enclosed area on the indigo planet, having the two types of challenges (mentioned above) present and intensified through blocking some spheres and hiding others. Here's a basic concept of what level six will look like:



Level seven is the last level in the game and is therefore the hardest. It takes place in a similar building as the one in level three, however, the storeys are eliminated and replaced with small platforms and the building is now on the violet planet. Here's a basic concept of what level seven will look like: