My Team Members: Manuel, David, Timothy, Daniel and me.

My team is making a "space adventure" as a project for this course. The base story for the game is a teenager (who will be our main character MC), who is half-alien and half-human finds his sister and mom missing due to an alien invasion and decides to go on a search for them in the vast cornucopia of space. The MC's dad being an alien, had taught him to ride a space ship which is equipped with basic weapons and his spaceship would get loaded with advanced stuff and weapons and he completes every level successfully. The space adventure has more than 3 levels and each level – as decided by the team will be faced by the MC in a different arena – which will be a planet of different environment. The goal of the game is for the MC to finally find his kidnapped mom and sister in the final level and defeat the aliens who kidnapped them.

Things that I have learnt in Unity:

My team has an efficient team play and a perfect split of tasks between us. I am very new to Unity and this is the first time, I'm building something related to gaming. And to be honest, I've enjoyed every part of this learning curve. My task in the project was to build a background for the space adventure level 1. It was pretty basic but I wanted to make it as attractive as possible. I decided to use a parallax effect in Unity – which takes advantage of 2 concepts in physics – distance and speed. So basically, the concept is to place assets in front of each other maintaining a specific distance between each other so that, it appears like a huge skybox which covers the entire space and the objects/assets are on top of the background and each object in there is set up with a different speed of activity – which is rotation in our case, since planets rotate – and so the overall effect appears to be objects with graphic features individually but also contributing together as a whole to produce the entire parallax effect. The camera is set inside the skybox and is set to a panorama view to capture the entire thing around. One more thing I learnt is about animation. I created an animation scene such that the entire space cornucopia revolves over a particular axis and then set the individual planet animation to rotate in another axis – so that, the difference of direction of rotation is visible. Actually, it was quite fun doing animation because I had 3 objects playing in an animation scene and at one point, speed of rotation of different objects looked very funny – like the outer space rotated very fast and the things inside appeared like they were all inside a washing machine. I had to go through online sources to solve the problem. To add more decoration, I added a particle effect – to make it appear like stars moving around in a random fashion. The final thing that I added inside was a comet – which moves at a very slow pace and will show up at one point when the animation scene plays. For the comet, I put in a spherical 3D object with a particle-system as its tail. The animation for the comet was set in such a way that the tail follows the comet spherical object wherever it moves.

My contribution to the game project proposal:

My part is to make the background for first level as of now. I'm planning to make it for one more level so that I learn more and make it more game oriented. The background is made in an interactive fashion and it moves continuously so that the spaceship just has to move using the four arrow keys – The overall effect is to make it appear like the spaceship is moving forward, but it is actually the background that is moving and taking the spaceship all the way to the enemy. An

animation scene is continuously playing in the background so that everything around the player moves by itself because of the parallax effect and the animation while the player just has to move the spaceship.

Assets found/ created including images, audio and 3D models:

For the space effect, I downloaded some pictures and put it up on materials. I created a huge 3D sphere to act as the skybox and put some 2 more small 3D spheres to act as planets suspended on a zero-gravity space. The planets had an asset called the Vast Outer Space that could be found at https://assetstore.unity.com/packages/3d/environments/sci-fi/vast-outer-space-38913. The asset was imported into the system and was put separate materials.

To add further effect, the particle system was put in the middle of the space to add the effect of stars into the game. I didn't import any asset into the model for the particle system but just modified the properties to make it appear like the stars. I learnt about the different ways the particle system can be projected, the speed and direction of projection and no. of particles projected at a particular iteration.

Implementation work done by me for the team:

I have implemented the background for the game – with basic animation stuff and particle effects. My implementation was done in a step by step fashion. At first, I referred a YouTube video where the parallax effect was put into a giant quad object. I tried it but failed. I re-thought the process and figured out my skybox is a space object and the way my team had designed the spaceship movement is that, it must move or proceed in-depth rather than in a horizontal fashion. I figured out I needed an object that wouldn't be affected by the geometric properties of the spaceship, other objects inside and all the other particles that we were going to include inside the skybox and finally decided it must be huge spherical cornucopia rather than a quad plane and it worked. The giant sphere is identical on all sides and hence doesn't get affected by other objects and has identical geometrical properties on all dimensions. The same would have been the case with a cube but I preferred a sphere. This was one thing that took a lot of time to figure out and then the next step – I added small spherical planets and then created the animation scene. Then later added the particle effects and finally the comet. The comet is in the animation scene as of now and I'm planning to write code to make it move in a fashion that I want.

Future plans:

My future plan is to build one more level background and code for the level completion. People from my team are building spaceship, the enemy ship, asteroids and other obstructions for different levels. One part that is not addressed by my team yet is what activity would mark the completion of each level. I wanted to start it with one level and I'm very new to C# and hence it would take time for the first one and then continue it to the different levels. For now, my team has added an attribute called "health" where the spaceship blasts to pieces if the health becomes zero. I'm also planning to add some boosts for health, like collect fuel and health boosts up to 20 points more. This is all my plan as of now.

Lessons learnt during this learning curve:

- When making a skybox, geometry matters
- Particle attributes creates a major difference in the appearance of the projection
- A game is an imaginary world and I can add more features to make it as attractive as possible.
- The positioning of camera plays a major role in making things visible in the game – it determines what the developer wants the player to see when playing his game.
- Background in not everything, but just a tiny portion of a large game.

Links referred:

https://docs.unity3d.com/Manual/class-Skybox.html

https://docs.unity3d.com/Manual/animeditor-CreatingANewAnimationClip.html

https://docs.unity3d.com/Manual/ParticleSystems.html

https://docs.unity3d.com/Manual/ParticleSystemHowTo.html

https://pixelnest.io/tutorials/2d-game-unity/parallax-scrolling/

https://www.gamasutra.com/blogs/DavidDionPaquet/20140601/218766/Creating_a_parallax_system_in_Unity3D_is_harder_than_it_seems.php

Video links:

https://www.youtube.com/watch?v=1bPiTcOPaUM&t=410s

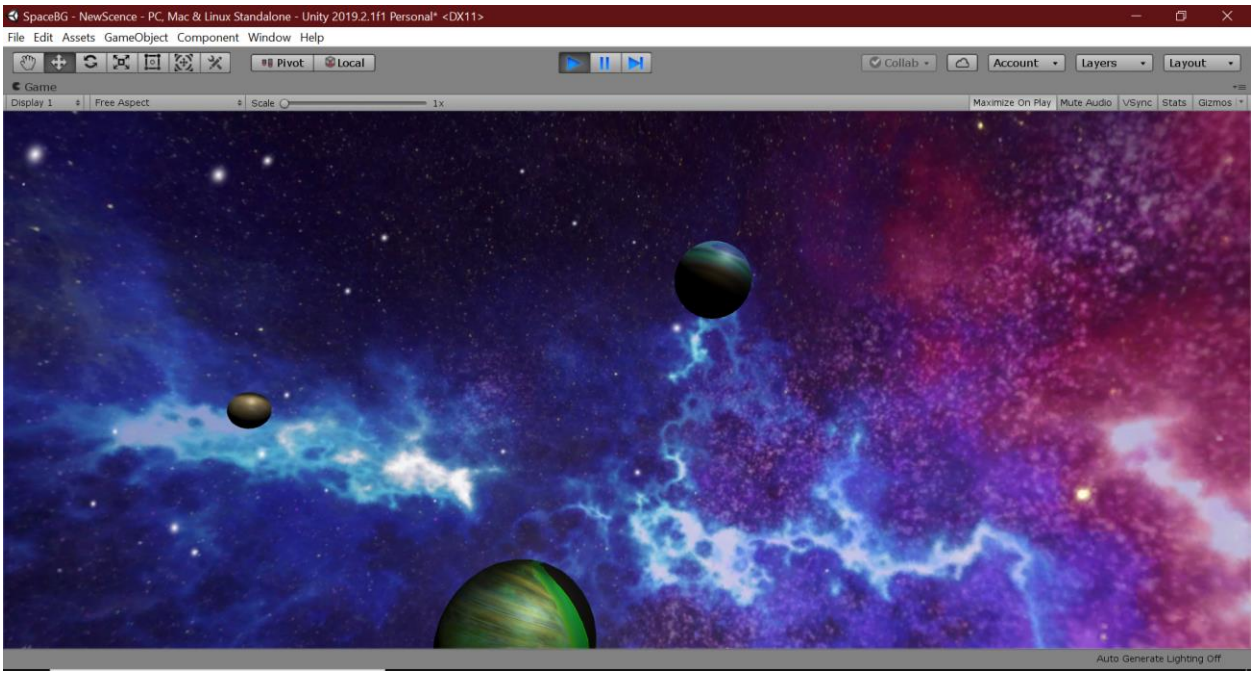
https://www.youtube.com/watch?v=LKhGqKYOmbo

https://www.youtube.com/watch?v=sgHicuJAu3g

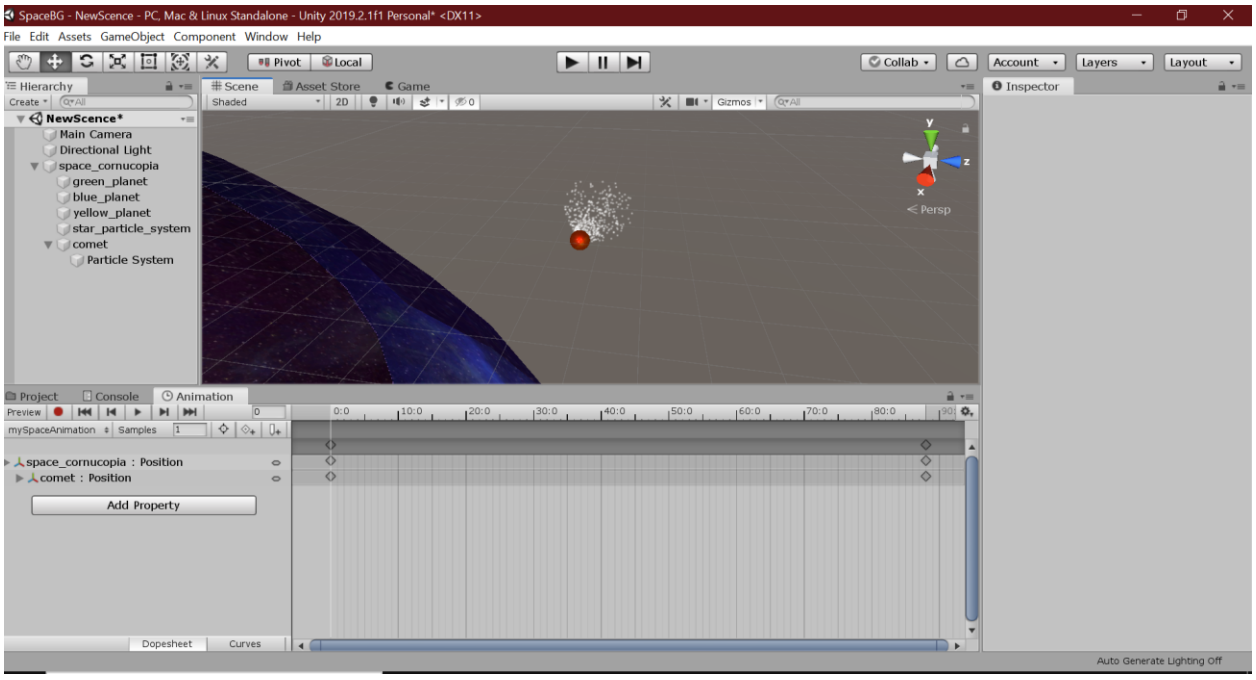
https://www.youtube.com/watch?v=FEA1wTMJAR0&t=

Some screenshots of my space background:

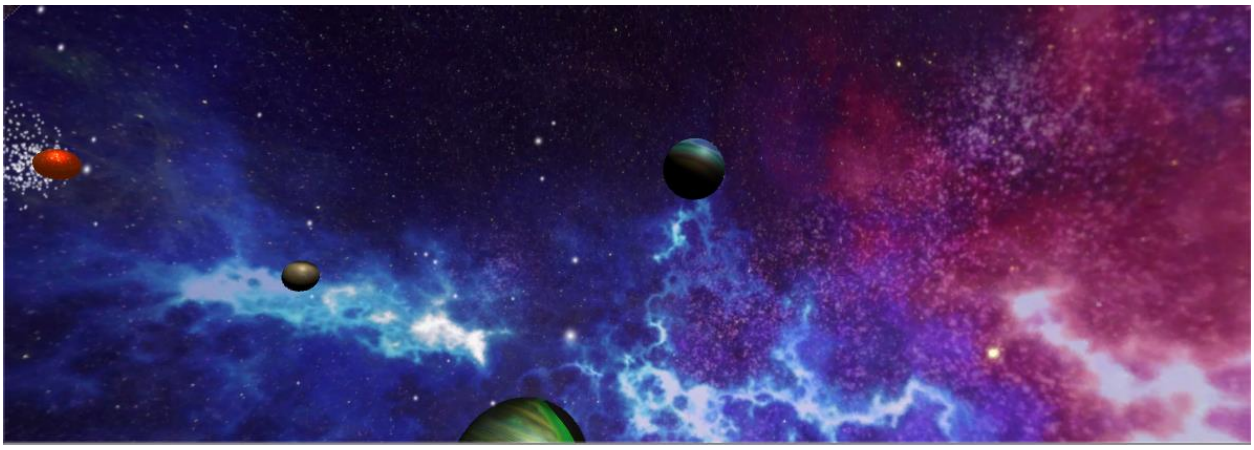
1. Image of skybox with particle system 1 – which is made to give the effect of stars:



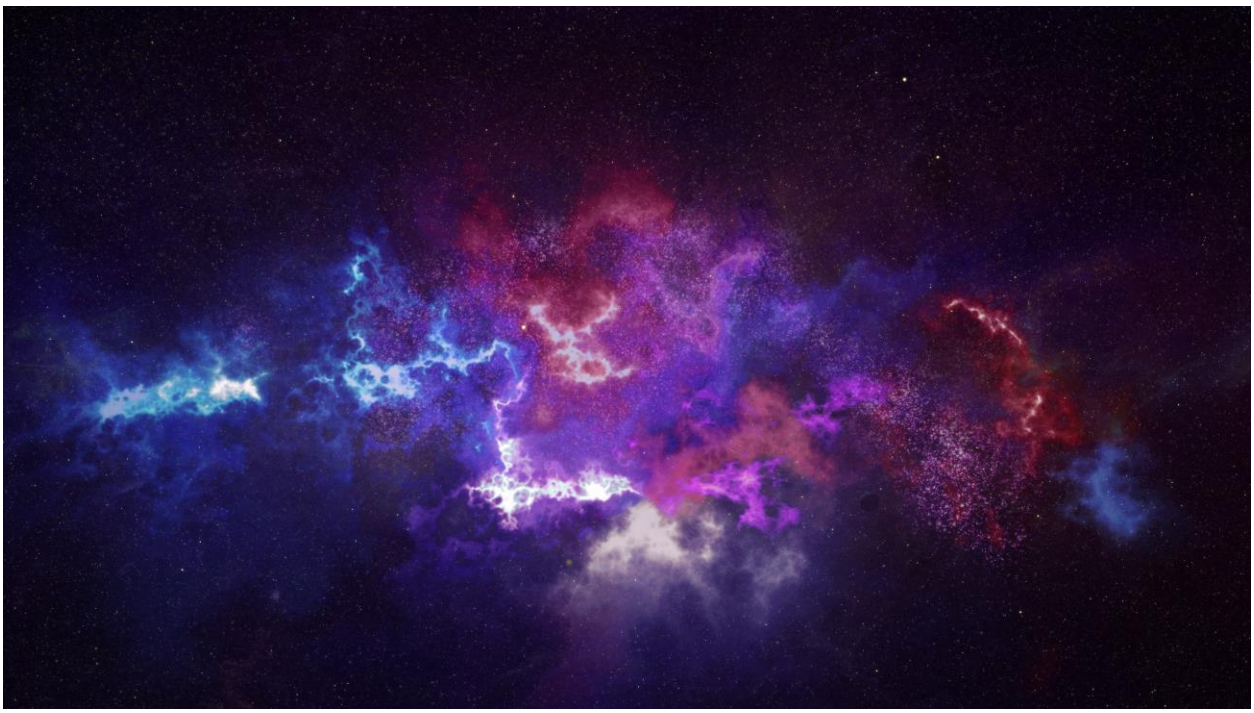
2. The comet with a particle system as its tail:



3. Comet in the actual space scene:



4. My plain space BG:



5. Overall space sphere skybox: