3. UP – The Remake

Part A:

1. Create a 3D house and a good amount of balloons (at least 8) that will be attached (e.g. on its roof) using strings. Moreover, develop a rocky/desert-like environment using any method you prefer (e.g. heightmap) and place the house on the top of the highest hill.
2. Implement basic physics for the 3D objects in the scene (e.g., gravity, collision detection). For example, the balloons should not be penetrating one another.
3. Create a different characteristic for each balloon:
    a. A balloon with glitter (preferable on its surface),
    b. A balloon with a metallic finish,
    c. A neon balloon,
    d. A transparent balloon that will contain a small scene or a 3D object inside it,
    e. A balloon with 3D texture, etc.
4. Implement basic lighting and shadows based on any of the common techniques learned in the lab.

Part B:

5. Implement a flight simulation algorithm for the house. Specify a target space in the environment and make the house fly until the target. Make the house drift in the air while it flies, and also simulate the resistance due to air.
6. Create “enemies” (e.g. birds), which will make the balloons pop upon collision. Create a popping effect using particles or any other method. The house should lose height proportionally to the balloons that have been destroyed.
7. Develop a user control mechanism to control the trajectory of the house while flying.
8. Make all balloons pop simultaneously. The house should fall with an increasing speed towards the ground. Upon contact with the ground, make the house fall apart into wooden pieces.

Bonus:

1. Make the string of a popped balloon fall realistically, while being attached to the house.
2. Add 3D characters in the scene (e.g. people, animals), and enable the user to attach balloons in their back. Make the characters fly in a height that is proportional to the balloons that they have (e.g. 2 balloons make the character fly higher, than 1, etc.).