Snowfall (Group 11)

*Cooper Proctor, Levi Neuwirth, and Steven Kim*

### Introduction

Our project is simulating snowflakes falling and snow building up on the ground. We were inspired by the first snowfall this semester in Denmark, which happened around the time of the project. Also, we personally are of the opinion that snow is pretty awesome.

### Challenges

The main challenge of this project was figuring out how to teleport the snowflakes from the bottom of the screen to the top of the screen without any visual bugs, as the provided rain example mentioned. To solve this, we followed the instructions in the rain example closely, creating buffer zones at the top and bottom that turn the snowflake invisible and an inner range where the snowflakes become visible. The most complicated part was implemented the theory into code, which took a while.

We had two primary challenges that we couldn’t solve. The first was rendering the snow accumulating on the ground. We have a rough implementation of an animated ground mesh rising as time passes, but since the ground mesh is 2D, it has no height and does not look like snow piling up. Ideally, we would use a terrain mesh and a dynamically updating height map to do the job, but this issue was too complex for us to solve by the deadline.

The second challenge was importing a snowflake mesh to replace our white place-holding polygon meshes. We found a free 3D model of a snowflake that we planned to export as a GLB file to use in our project. However, we couldn’t figure out how to correctly import it and replace our existing meshes with them with the amount of time we had left.

### Discussion

If we had more time, we would first focus on implementing the challenging features mentioned above that we couldn’t get to. Aside from those, our focus would have been on having snowflakes fall at independent rates. The movement as of now is fairly uniform for each snowflake, since all of our snowflakes are a part of the same mesh. So, isolating the groups of vertices using their IDs and programming randomized falling patterns per individual snowflake would have been a nice touch. We also would’ve liked to implement bill-boarding so that different viewing angles could be accommodated for. Another thing would be to dynamically change the level snowflakes disappear to match the rising snow levels, adding more realism to our project.

That being said, we came a long way from our initial attempt in which teleporting wasn’t working, and our mesh didn’t look anything like a hygge Copenhagen snowfall. We are proud of the progress that we made!

### Sources

We used the rain example as a guide for cycling and repositioning the mesh with the vertex shader.

We also referred to the wave/flag example to help with a slightly varying and slowly building level of snow on the ground.

### Finally, thank you, Benno, for all of your help with our project and for a great semester!