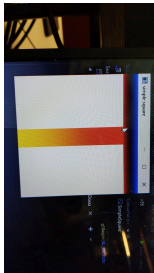
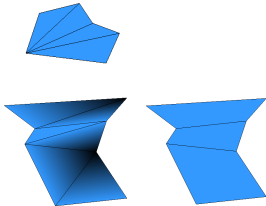
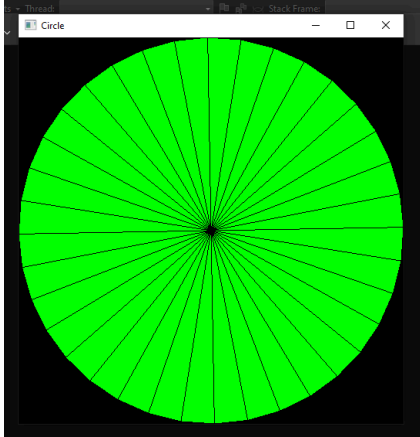
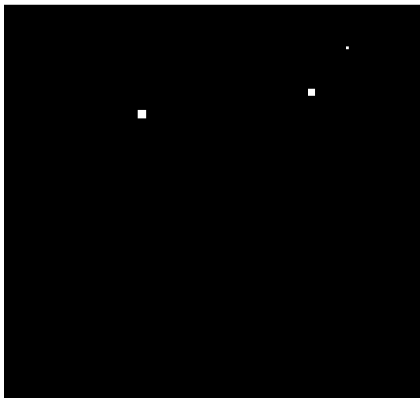
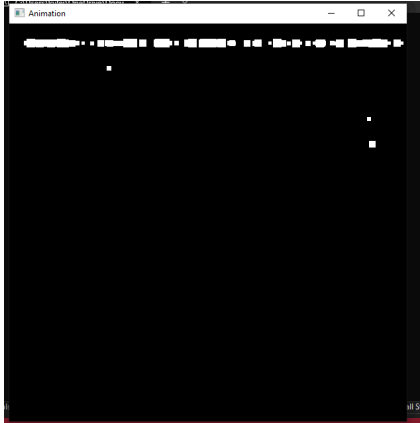

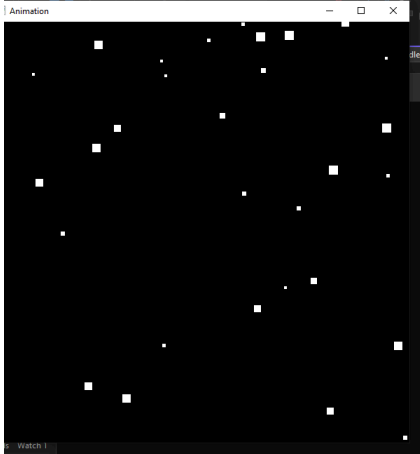
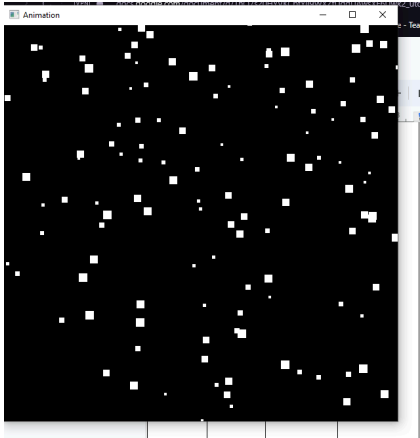

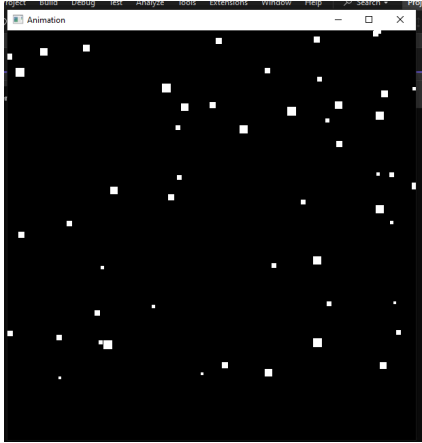
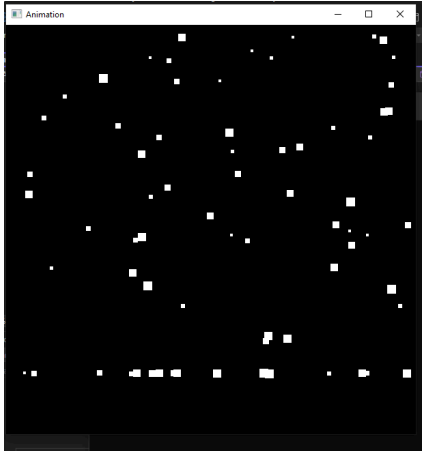


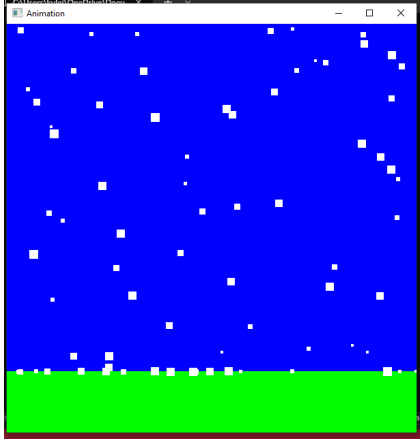
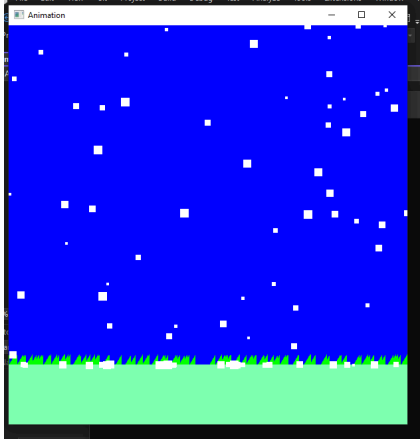
Time Spent	Date	To do	Work done	Detail	Bugs
2 hrs	16/07/2024 4pm-6pm	Learn how to use opengl. Create simple shapes.	Get freeGlut working on visual studio 2022. I created a colourful T and created GL primitives.	<p>The first steps seemed rather simple, however visual studio could not find freeglut until I redid the entire project twice.</p> <p>With it working I managed to get the basic shapes made, until the colourful T where I made 1 polygon and it made a rather strange shape. I realized how freeGlut does polygon creation and quickly fixed it by making 2 polygons, this allowed me to make the T quickly.</p>  <p>With these, I figured out how to get the simple strip of the polygons working, then somehow missed that the fan used "GL_TRIANGLE_FAN" and used strip for it, which worked, however my friend pointed out to me the actual intention resulting in me adjusting my code and getting the same result but more efficiently.</p> 	<p>When I returned to this the next week, all my folders had been deleted and I only redid the primitives for a photo.</p> <p>My main struggles were with getting freeGlut working on Visual Studio. These errors persisted until next week, I will have to see how long until I get the hang of setting that up or if I find an easy shortcut.</p>

2 hrs	23/07/2024 4pm-6pm	Learn how to make circles. Learn how to animate	Created a spinning circle.	<p>I first went about making the circle, then I went about making it spin.</p> <p>Once it was spinning I somewhat struggled to tell, however I decided to copy a friend who was next to me, and add lines so that I could easily tell what was happening.</p> 	<p>First bug, getting freeGlut back onto the project was difficult, however I found an easy solution, I copied my previous solution and just went off that.</p> <p>For this project, I struggled to get it to animate and took a lot longer to get it to work than expected. Thankfully could ask multiple friends around me for</p>
1 hr	29/07/2024 3pm-4pm	To make small snow drops from the sky	I created 3 dots, of random size drop and come back up on repeat	<p>I followed along with what the teacher was explaining and made 3 dots. That dropped down</p> 	

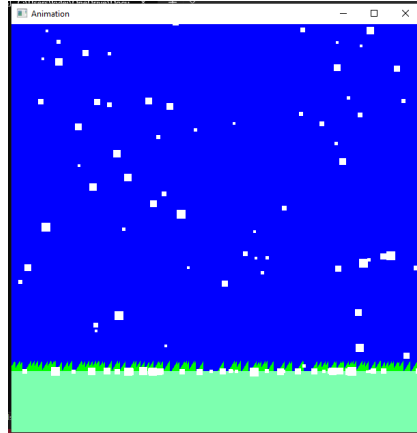
6 hrs	30/07/2024 12pm-6pm	<p>Make snow fall from the top of the screen down.</p> <p>Make them random sizes and reset whenever they go to the top.</p> <p>When they hit the bottom, they “vanish”.</p> <p>Control how many are on the field.</p>	<p>Created the dots, got them falling.</p> <p>Made the snow random sizes.</p> <p>Have them dropping at different speeds.</p>	<p>The first draft landed up making all the snow particles get stuck going left and right.</p>  <p>Once that was sorted I had decreased the total number of particles so that it wouldn't overload the PC but they were all on the screen at the same time, so my next step was to limit how many are on at once.</p>  <p>Start Now at the start of the program only a couple fall and by the end of it.</p>	<p>The left and right movement of them was the only real bug I faced, however was quickly fixed when I noticed I didn't assign the dy variable.</p>
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				 <p>End: There's a lot more.</p> 	
4hrs	31/07/2024 12pm-4pm	<p>Adjusting snow to feel more “lively”</p> <p>Creating ground, and grass.</p>	<p>Made the snow stop at -0.7f rather than at the bottom of the screen.</p> <p>Made the snow fully reset rather than just returning to the top.</p> <p>Made the snow start all over the place rather than just at the top.</p>	<p>First step rather than having the snow start at the top it now starts all over:</p>  <p>Turned the creating snow into a</p>	<p>The biggest bug I faced was trying to get it so that the grass was spawned in a random spot and not overlapping. Getting stuck in an infinite loop. I figured out that it's because I had it in a function, then the loop inside that function it would land up reaching where the grass[i] was the same one to the one we're currently working with and it couldn't fix that since they were</p>

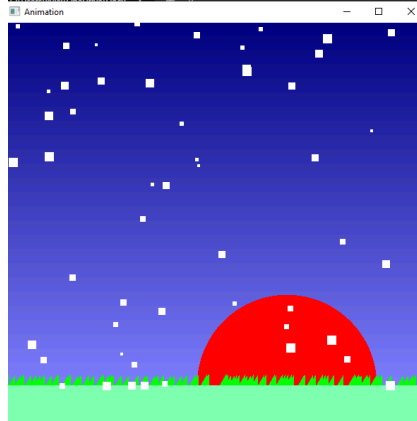
			<p>Created ground, made it white and placed grass on it.</p>	<p>function and it's called in the init and also when the snow reaches the bottom it resets back to the top but the create snow function is called and this allows for a change in size to occur again.</p> <p>I also changed where the end point for the snow is to decrease so that when I implement the ground it will stop at the ground now lower down.</p>  <p>I've now got the snow falling and staying on the ground for a specific amount of time.</p>  <p>I then made a blue background and a green ground as to begin setting up the full background.</p>	<p>always equal.</p>
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				 <p>Now with some struggle I got 100 triangle grasses made:</p>  <p>I also turned the ground more white as to match the snowy theme, but the grass remains green.</p>	
4hrs	03/08/2024 10am-2pm	<p>Adjusting snow to be further advanced.</p> <p>Changing ground to be less level for half the field</p> <p>Making grass only grow on the hill.</p>	<p>Made the snow mode along the x slightly.</p> <p>Created a mountain, using a random generator to make a random sized circle..</p> <p>Created the grass to go on top of the mountain.</p>	<p>I started by making the snow move slightly side to side while dropping. This gave a better effect of snow.</p>	<p>The biggest bug I faced was getting the grass to grow on the mountain, I had it grow all over the place and it was looking like this:</p>

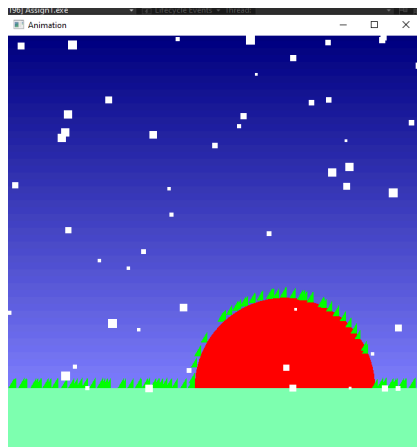
Stopped snow
falling onto the
ground.



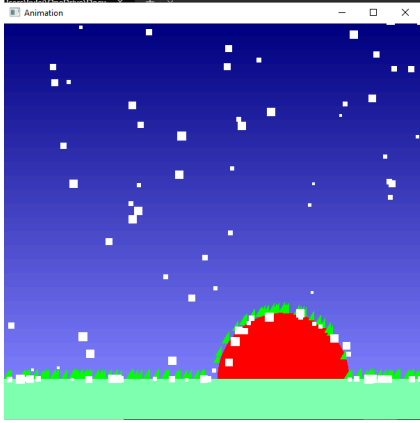

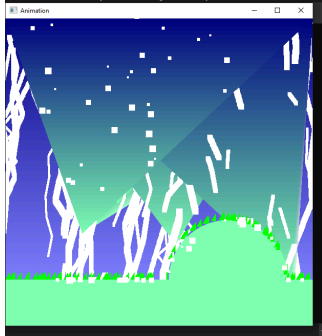
I followed this up by making the
mountain easy to spot with a
red colour.

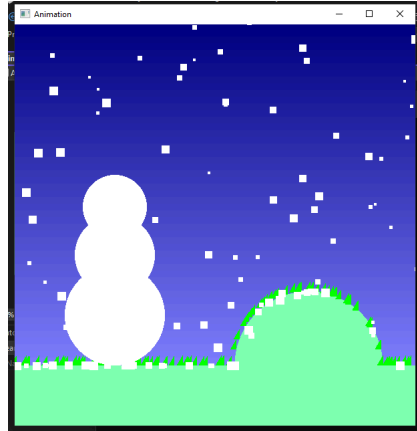


Next I went to work making the
grass grow on top of it and not
the floor below it.

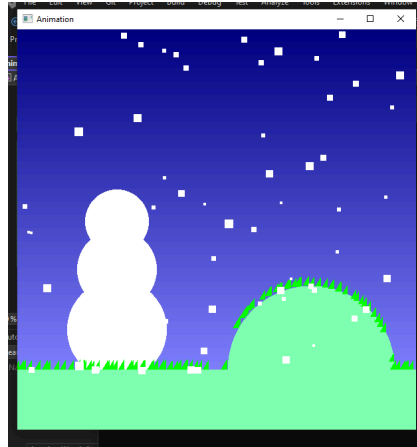


Or some other variation
of it. I realised I was
dealing with an area
formula and needed to
square root the answer I
had for the circle at any
point.

				<p>Then needed to have the snow stopped when it lands on the hill and now the ground below it either.</p>  <p>And finally I set the colour to be the same as the ground so it would blend better..</p> 	
3hrs	5/08/2024 1pm-4pm	Make a snowman.	Made a snowman, gave it details.	<p>I started by making a simple snowman using 3 circles, I had them placed in front of everything so I could see exactly what was happening</p>	<p>While trying to make a snowman, I managed to make this bug:</p> 



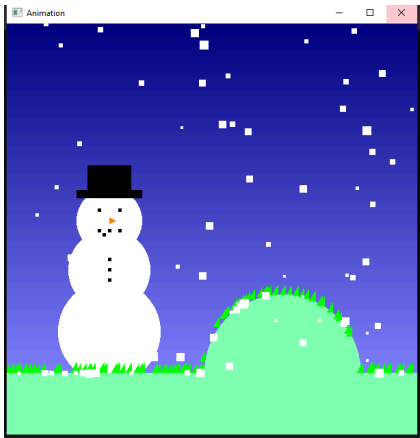
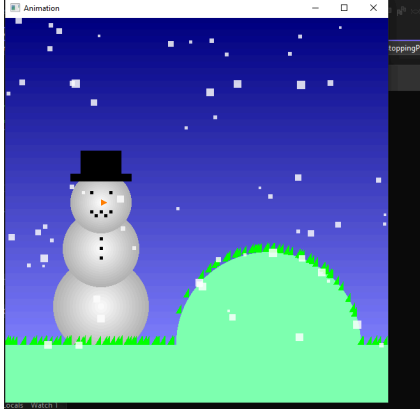
Once the snowman was built I adjusted the snow to be behind everything except the skybox.

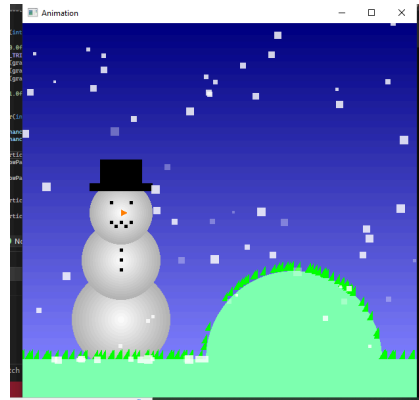


I then realised my calling it a hill and having a snowman be larger than it doesn't really work. However I do not wish to change the grass on top of it, so a giant snowman it is.

I then added dots, top hat and a nose to the snowman.

I don't know how to replicate it. I deleted the snowman code and repeated it, it was then working.

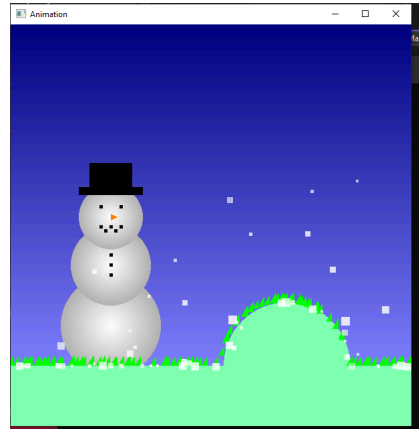
				 <p>With this my snowman looks</p>	
2hrs	08/08/2024 12pm-2pm	<p>Giving snow some transparency on spawn.</p> <p>Make the snow sometimes go more transparent as they drop.</p> <p>Implement S key to start and stop..</p>	<p>Made snow become more transparent.</p> <p>Made snow become less transparent as it lowers.</p> <p>Made the S key start and stop the snow.</p> <p>Started preparing for animation of the grass by sorting it by its position on the x.</p>	<p>First step I changed how it worked when they were spawned in. This would allow me to immediately tell that I had my transparency working.</p> <p>I also adjusted the snowman a small amount to better fit the requirements.</p>  <p>Now the snow looks more transparent and smaller ones are more transparent than larger ones.</p> <p>Next I made a invisMaker function to make snow more transparent as it falls. For the screenshot I made the variable more extreme.</p>	<p>The biggest bug I faced today was with trying to get the quicksort working, it kept resetting the y of the grass to equal 0.0f, after many fixes I realised I had placed it in the loop so the sort was being called many times without all 100 grass particles being filled.</p>



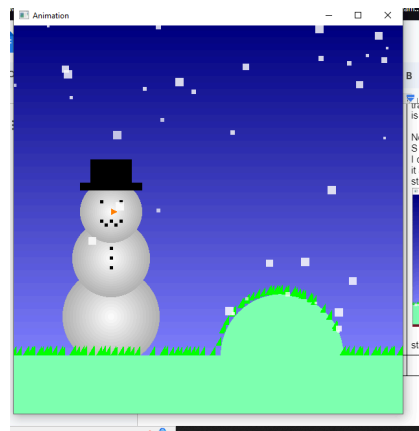
I also made it so when a snowflake reaches 0 transparency it's activity status is set to 0.

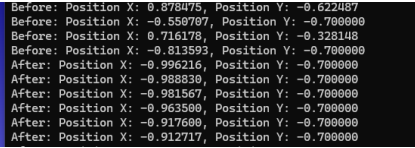
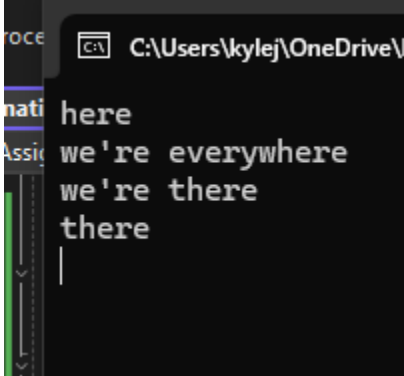
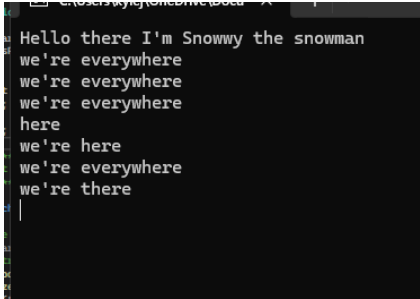
Next I went about setting up the S key to stop and start, with this I can clear the screen and start it again.

stop:

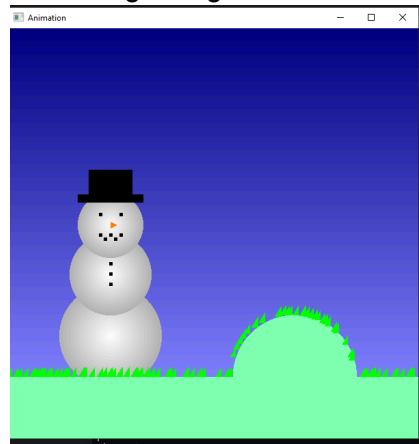


start:

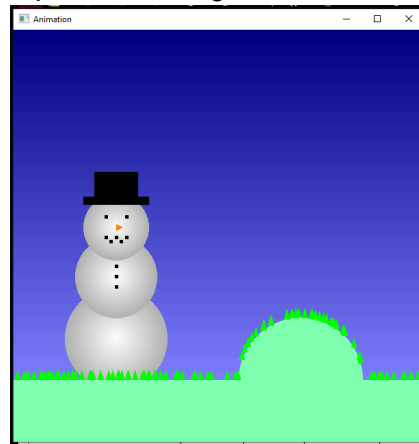


				<p>With the remaining time I had, I set up a quicksort algorithm for my grass to stop it by the x. This would allow me to control their final placements.</p>  <p>I used printf to make sure the sort had done it correctly.</p>	
3 hrs	09/08/2024 9am-12pm	<p>Get the snowman to talk, have about 5 statements for him to say.</p> <p>Get the grass and snow animations complete.</p>	<p>Made the grass turn.</p> <p>Made the snow melt.</p>	<p>My first step with getting speech working was just using printf as it would require less work first.</p>  <p>I then set it up so that the first speech spoken will be a greeting.</p>  <p>I then needed to now get it working with the speech statement.</p> <p>After much struggle I moved on.</p> <p>I began making the grass “blow” in the wind with 3 different animations. I first started by making the 3 different shapes.</p>	I couldn't get text working at this point, will look into it another time.

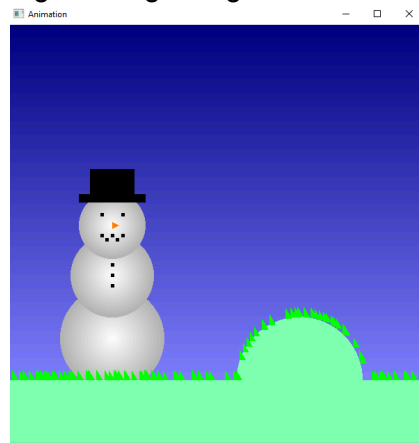
Left facing triangle:



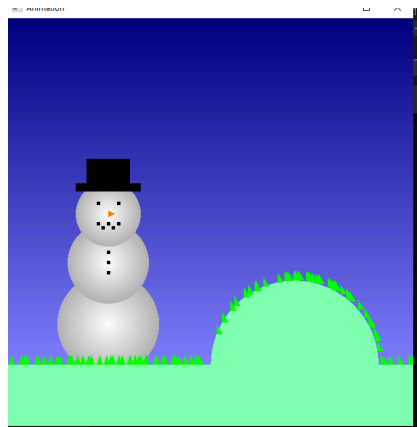
Equilateral triangle:



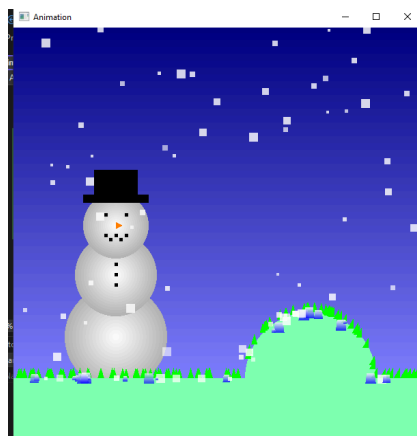
Right facing triangle:



Next I made it start at one point and flow through to the rest.

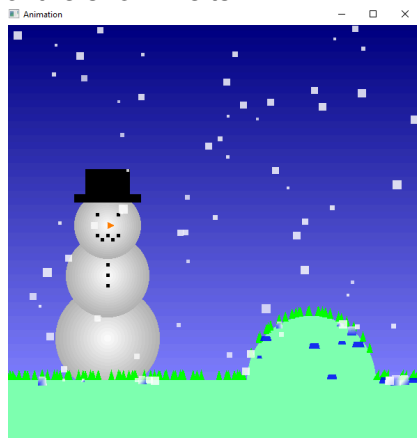



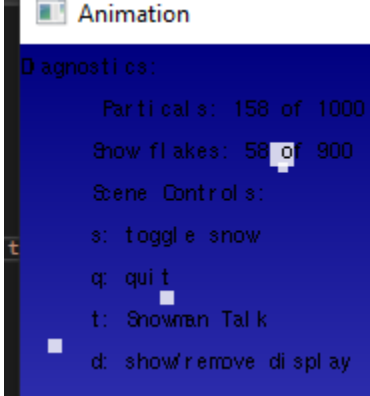
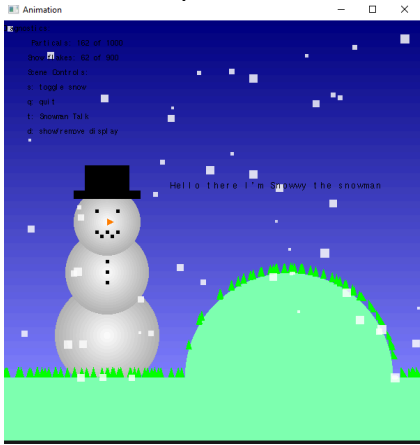
With that done, I could move on to the snow which I disabled for this segment.

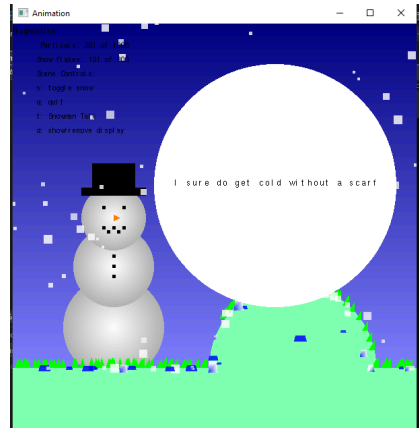


I got the first step of the snow melting. Where it turns blue with the white on top.

Then with more time even more of the snow melts:



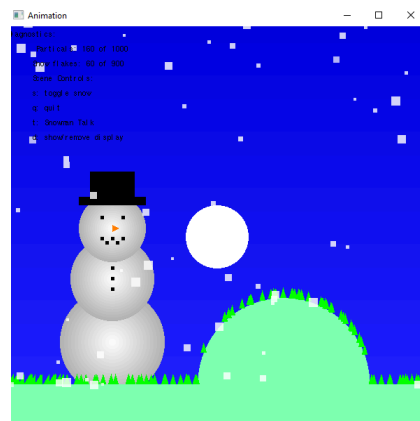
3 hrs	10/08/2024 1pm-4pm	<p>Get Display working.</p> <p>Get the speech statements writing on the screen.</p>	<p>Got the display working.</p> <p>Got the snowman talking.</p>	<p>My first step was getting a display showing.</p>  <pre> Diagnostics: Particles: snow: 263 of 1000 snow flakes: 163 of 900 Scene Controls: s: toggle snow q: quit t: Snowman Talk </pre> <p>I then set up a way to turn it on and off using the d key and added the control to the screen:</p>  <pre> Animation Diagnostics: Particles: 158 of 1000 Snow flakes: 58 of 900 Scene Controls: s: toggle snow q: quit t: Snowman Talk d: show/remove display </pre> <p>I then went to work getting the snowman to speak.</p>  <pre> Animation Diagnostics: 150 of 1000 Snow flakes: 60 of 900 Scene Controls: s: toggle snow q: quit t: Snowman Talk d: show/remove display </pre> <p>Hello there I'm Snowy the snowman</p> <p>Once he could speak I began working on getting a speech bubble.</p>	<p>It took me a while to get display working, and to get it's sizing working as I wanted it to, noticed how i/l make weird spacing between it and the next letter however didn't wanna figure out why, suspect it's because they take the same amount of space as other words but only cover half as much area.</p>
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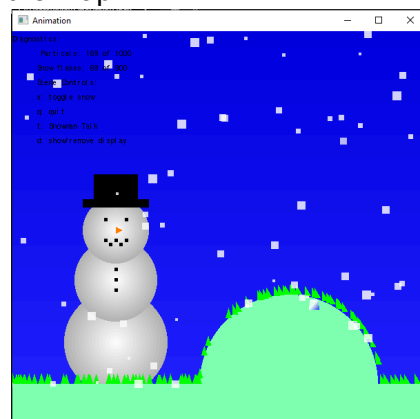
A large speech bubble however stops any text being missed.

No real bugs for this.

Then the moon:



Then my next step was to have them move in a circle around the map.



Normally both will not be on screen, however because the moon moves faster than the sun we can sometimes see the moon without the sun:

				<div data-bbox="841 205 1258 651"> </div> <p>As the sun rises the sky turns more blue until:</p> <div data-bbox="841 760 1258 1197"> </div> <p>Made an eclipse as well:</p> <div data-bbox="841 1243 1258 1680"> </div>	
2hrs	13/08/2024 4pm-6pm	<p>Change the ground to be not flat.</p> <p>Get the grass</p>		<p>I started by making the ground no longer flat:</p>	

		to stick to the ground		<div data-bbox="842 207 1260 648"> </div> <p>I then set the grass and snow to a lower position as to make it all level and melt simply.</p> <div data-bbox="842 795 1260 1236"> </div>	
Total:	32 hours				