Newton Lab Physics Experiment

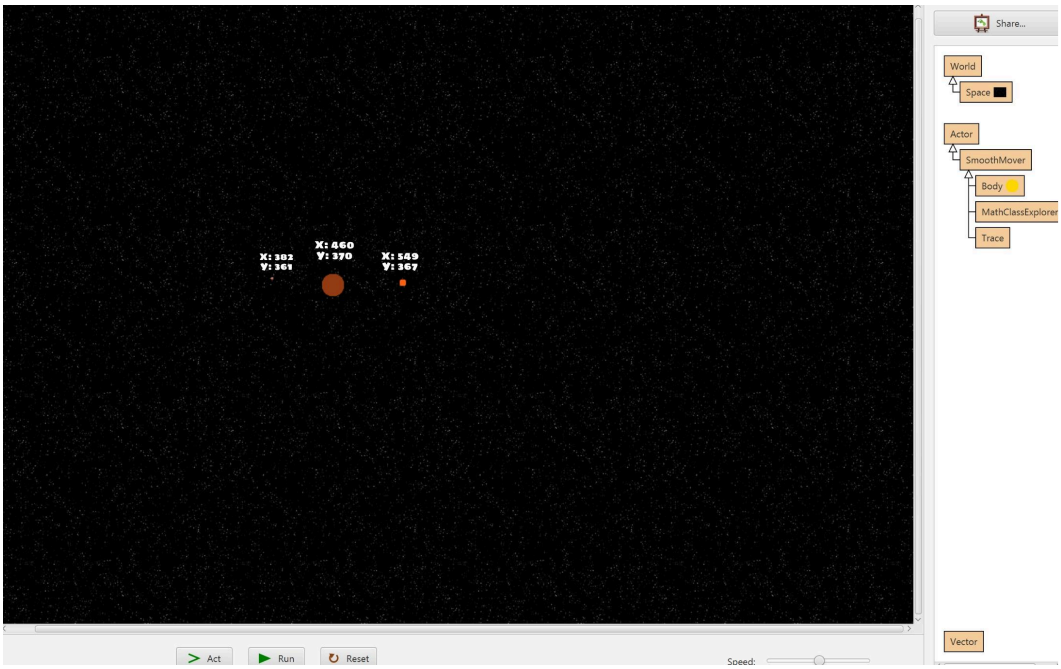
Introduction: Tatooine, the planet where Anakin and Luke Skywalker grew up, has two suns, Tatoo 1 and Tatoo 2. So far, I have only tested the simulation with one sun and several planets. I will be trying to balance out the gravitational pull of celestial bodies so that they don't immediately crash into each other. The variables that I will be studying are the addition of another sun, the removal of one of the planets, and an addition of 3 small moons orbiting around the remaining planet.

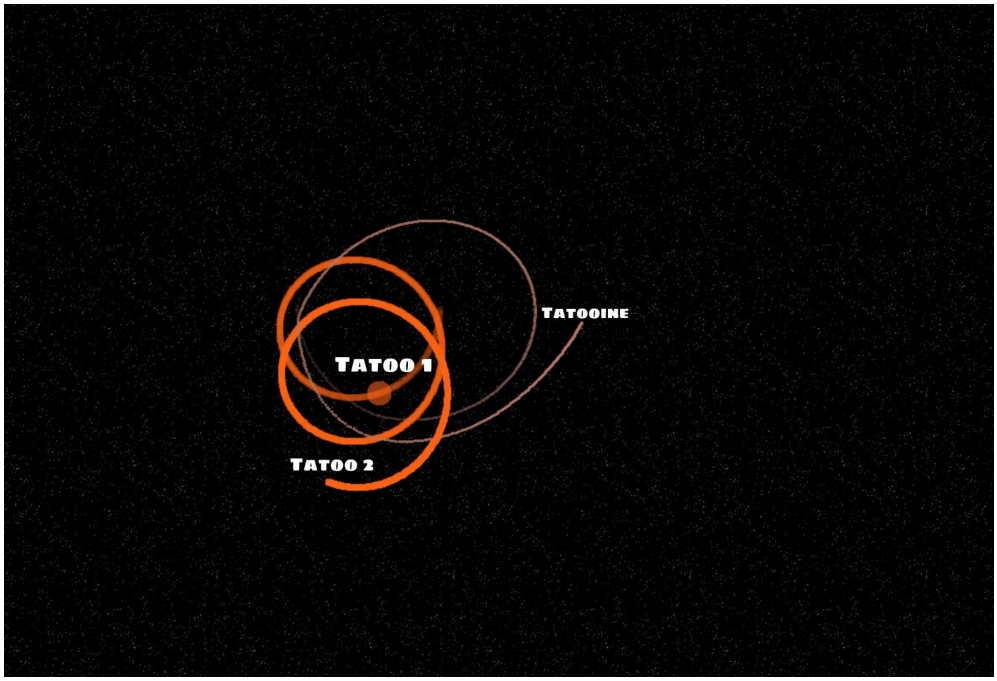
Hypothesis: If I don't balance out the mass and distance of the planet, suns, and moons correctly, then they will crash into each other because they are too close, and their individual masses are exerting too much pull on each other.

If I am able to balance out the pull of Tatoo 1 and Tatoo 2 on each other especially, then I should easily be able to get Tatooine (the planet), to orbit around the two stars because the pull of the planet will be easier to balance out once I have the pull of the stars down.

Data:

Body	Size	Mass	Vector	Color	Trace
Tatoo 1	30	6.4 * Math.pow(10, 12)	(270, 0)	(150, 60, 20)	False
Tatoo 2	10	4.2 * Math.pow(10, 11)	(90, 2.4)	(255, 100, 20)	True
Tatooine	5	4.2 * Math.pow(10, 9)	(90, 3.0)	(180, 120, 100)	True





Analysis: It took me a super long time just to be able to figure out binary stars, or two star systems. Finally I figured out that one of the stars can just be treated as a planet for mass purposes. After that it was a matter of adding in a planet. I tried to add in a planet for a good hour. The gravitational pull of the two stars in the system on the planet, Tatooine, kept making it crash into the stars, or else it would fly off into space.

I reached a compromise by changing the angle of Tatooine's vector. It still doesn't have a perfect orbit around the two stars, and it seems like it's getting farther away from them, but at least the Skywalkers won't burn up in a star now.

I ran out of time to add in Tatooine's three moons, Glomrassen, Guermessa, and Chenini. They would have added another level of difficulty to the project, as I would have had to make sure that they weren't pulled out of orbit by the smaller star, Tatoo 2. Perhaps they could have balanced out the orbit of Tatooine somewhat, but I truly didn't have the time to test them out.

Conclusion: My first hypothesis was correct in that the imbalance of the gravitational pull exerted on the individual bodies in the system would cause them to crash into each other- many, many times. My second hypothesis was actually incorrect because it took me much more trial and error to get Tatooine to orbit around Tatoo 1 and Tatoo 2 than I originally thought. Some error was caused in the experiment by the scale of the system. No planet can be that close to two stars and still be cool enough to support life. But since Tatooine is a fictional desert planet, that didn't matter too much to me. In the end, my three main takeaways from this experiment were that space is huge, stars are big, and black holes are very, very scary.