Team otter_Space APCS2 pd 2
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Final Project Proposal

"Space Architect Program"

Space is such a wide, dark, and mysterious place. That's why many kids wanted to become an astronaut when they were younger. The thought of exploring new worlds and galaxies is very exciting. But why stop there? Creating these new worlds is an even more exciting temptation. Stars, moons, comets, meteors, entire solar systems and galaxies, you name it! The possibilities are endless as long as you have science!

This star formation simulator will be implemented in steps and will use the concept of states (as we've seen in lab 04) to progress from one screen to the next. The steps and accompanying 2nd semester-related topics are as follows:

Phase 1:

- Printed intro screen with star nursery logo
- User is prompted to click on the screen to begin

Phase 2:

- State shifts from Intro to Nebula
- Screen is populated with shapes that give the overall impression of a gas. Will require a gas class to specify the behavior of a gas.
- Screen will feature a place for the user to make selections about the star they want to form (ie. size, composition, other attributes). Selections will be stored in a queue to facilitate future "creation of the star".
- User is prompted to click on the screen. This makes certain areas of the screen more dense.

Phase 3:

- State shifts from Nebula to Animation (condensing of nebula into a star)
- User can no longer make selections about their star and, instead, watches gas collapse faster and faster around the point they made more dense.
- Animation concludes with a result of the type of star the user made (using previously stored data).

Phase 4:

- State: Solar System
- Given the size/ type of star created by the user, the user is given different choices as to how they want to populate their solar system.

- Screen zooms out as more celestial bodies are added (eg. planets, moons, comets) and their orbits are traced convincingly.
- The user is able to add more orbits, remove bodies, insert bodies on a collision course with other bodies (and seeing that play out)
- Some of the bodies have priority over others when being input into the solar system. A heap structure can be used to implement a priority queue that will, in turn, be used to maintain the visual solar system.
- Once the user is done playing around with their creation, they can choose to save their choices and quit the program, make a new system, or to proceed to the death of their current system.

Phase 5:

- State: End
- If the user chooses to save and quit, the program would print an end screen, somehow save the user's data (csv if possible), and close.
- else if the user chooses to make a new system, state reverts back to the Intro and everything is repeated.
- Else, the star executes its death sequence, which differs based on the size of the star (we can use realistic figures for this).