

PROJECT REPORT

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Idea:

I HAVE MADE A SIMULATION DEPICTING HOW STARS ARE FORMED AND HOW A SYSTEM IS FORMED BETWEEN STAR AND PLANETS.

TECHNOLOGY USED:

I have used Pygame because I recently used it for my python project and was well aware of its functionality.

IMPLEMENTATION DETAILS:

So in my code there are mostly 5 noticable features Moving of Particles,Combining Particles,Universal Gravitation,the fade in effect and the simulation controls.

Moving of particles: For this,I just updated the x cordinate every time by adding velocity vector's x component and y-component respectively.

Universal gravitation:

I just defined an accelerate vector which does nothing but add acceleration vector to velocity vector and updates it.

here this acceleration vector has been defined with the help of newton's law of gravitation.

Combining Particle:

Here i first checked if 2 particles are touching each other, if so then I conserved their momentum in an inelastic collision and made the p1 particle double in size and gave it new velocity vector according to the conserved momentum.Later i defined a collide_with attribute of the class particle which can be accesed by using __dict__(gives all attributes of anything as an object in python) in main function which can then be used to remove p2.

Fade-In effect:

For this I used the set_alpha function and redered the screen black for some time and then reupdated it with every iteration making alpha more and more lesser until it reaches max value.

Simulation Controls:

For this I designed another class named UniverseScreen which alters the particles according to the function called.

(kind of like shifting the orgin in a 3d plane but only in 3 direction).

Future Scope:

Because of a little tight schedule I was not able to complete it completely.I wanted to add a background voice explaining all the scematics based on the number of particles left.I wanted to add fade in on the intro boxes as well.And i wanted to make it on vpython but was not able to download it so had to work with pygame.

Experience:

Greatly influenced by what all a programming software can do.

My dream is to start learning C# so as to work with unity and unreal engine.

Learned a lot from my errors again and again.

Mostly while learning __dict__ and importing modules.