Lam Comp Class HW5

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1 Problem 1

In this problem we are supposed to simulated 2 galaxy clusters using N-body simulation by Barnes-Hunt. We were supposed to use the data provided in order to use one of our integration methods to see how the 2 clusters where supposed to interact with each other and see there "Merger". I tried to use a recursive method and tried to build my tree and in doing so add restrictions here about what would happen if we have only have one data point, and we added a place to store if we do. In the nodes I tried to split up the the areas that have data to the ones that did not have data so we can stop the creation of more nodes. When we did the split and they have more than one data point we would do the process over again till we are left with one point. The ones that did have one data point I wanted to append them in leaves. I figured since we are using the tree method might as well keep that name. Now for making "Children" to single out more data points and finding the center of mass between them happens in the step where we are not left with one data point after the first set of nodes. We do these repeatably with a time step to be able to see where the galaxies will end up. Unfortunately I feel like I got about 80% done with this problem and stopped on this error RecursionError: maximum recursion depth exceeded. I know I should have emailed you on this point but I over came the other ones and this is as far as I have gotten time wise. I know how the problem should be and what it does and how to code it... sorta. Any ways I can't fall behind again.

2 Problem 2

For this problem we are supposed to find the gravitational potential between two galaxy clusters at the positions given on the HW graph.

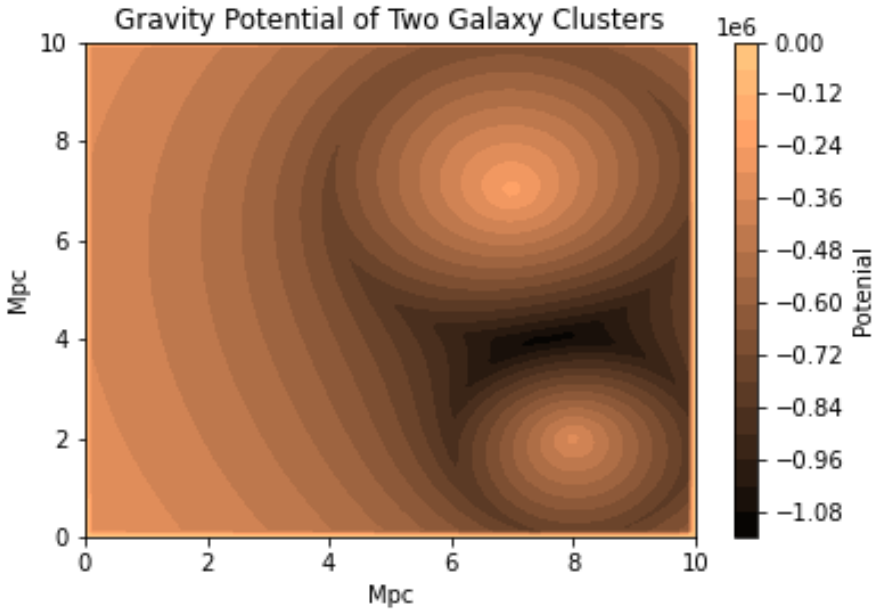

Figure 1: As we see here we are able to see the greatest potential is right in between the two galaxy clusters. This is what we expected since the equation has both masses and radius dependant as well. At the center we see the potential drop down since radius is too high between them but if we were analyzing one galaxy isolated it we would see different results. Since we are taking the potential across the box we see it to be extremely low. One thing I did not understand was the comment in the HW that it would be zero along boundaries along the cube. Another thing was tricky was trying to plot a contour plot that will show the intensity of the gravity potential. Thankfully working with others that found the book by Jake VanderPlas This is the link to that book