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HW3 400B Questions

1. This simulation shows that the total mass of MW and M31 are approximately the same! Both galaxies' masses are strongly dominated by their dark matter halo.
2. M31 has a higher stellar mass, thus we'd expect M31 to be more luminous (because there are more stars).
3. MW has a larger ratio of dark matter. Because M31 has a higher stellar mass ratio and therefore more massive stellar components than MW, we might expect it to proportionally also have more dark matter. However, we see that larger stellar masses do NOT necessarily correspond to a higher amount of dark matter.
4. For MW ratio = .041, for M31 ratio = .067, for M33 ratio = .004. That is a much higher baryon fraction than what we found in this simulation. It seems like we could perhaps be overestimating the presence of baryons in galaxies, instead of considering baryons outside of galaxies (in the ISM).

Galaxy Name	Halo Mass (10^{12} Msun)	Disk Mass (10^{12} Msun)	Bulge Mass (10^{12} Msun)	Total (10^{12} Msun)	f_{bar} (stellar mass/total mass)
MW	1.975	0.075	0.01	2.06	.041
M31	1.921	0.12	0.019	2.06	.067
M33	0.187	0.009	0.0	1.96	.004
Local Group				6.08	.038