Ay190 – Worksheet 1
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Linear Regression

(a)

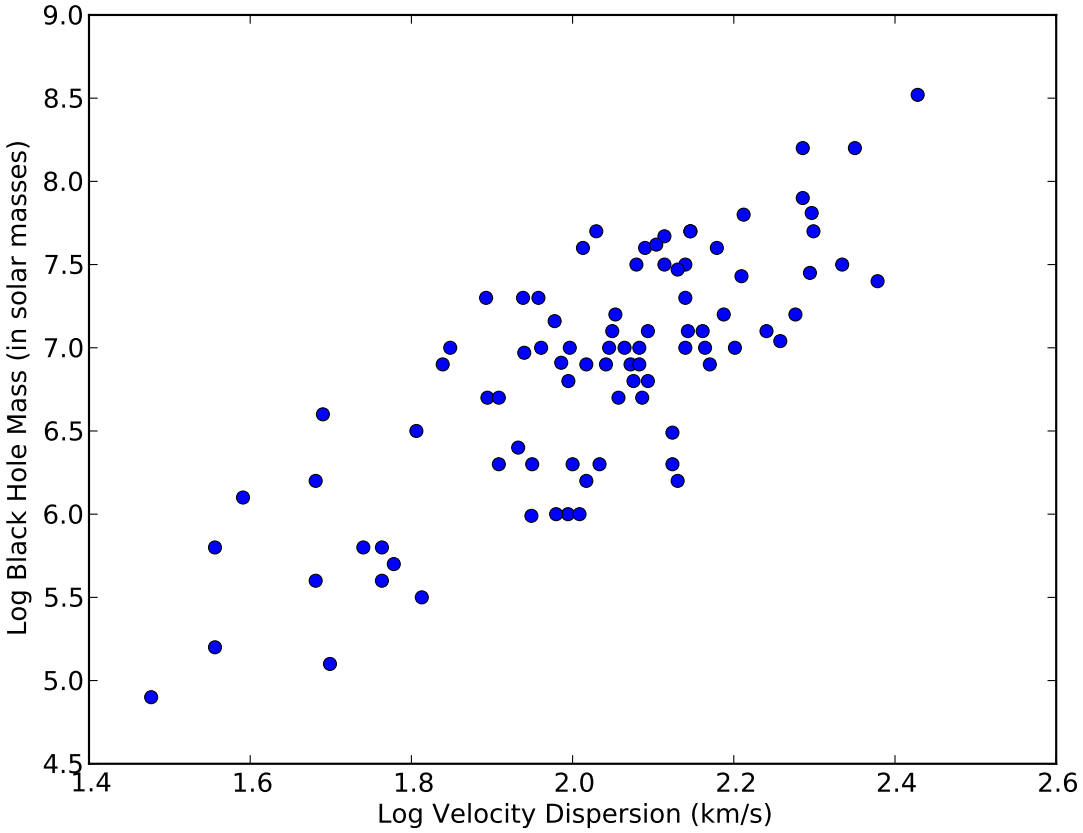

Figure 1: Plot of black hole mass vs velocity dispersion, without error.

(b)

a_1	σ_{a_1}	a_2	σ_{a_2}
0.93106967817676167	1.1158802783711324	2.925429008834183	0.54749789824558692

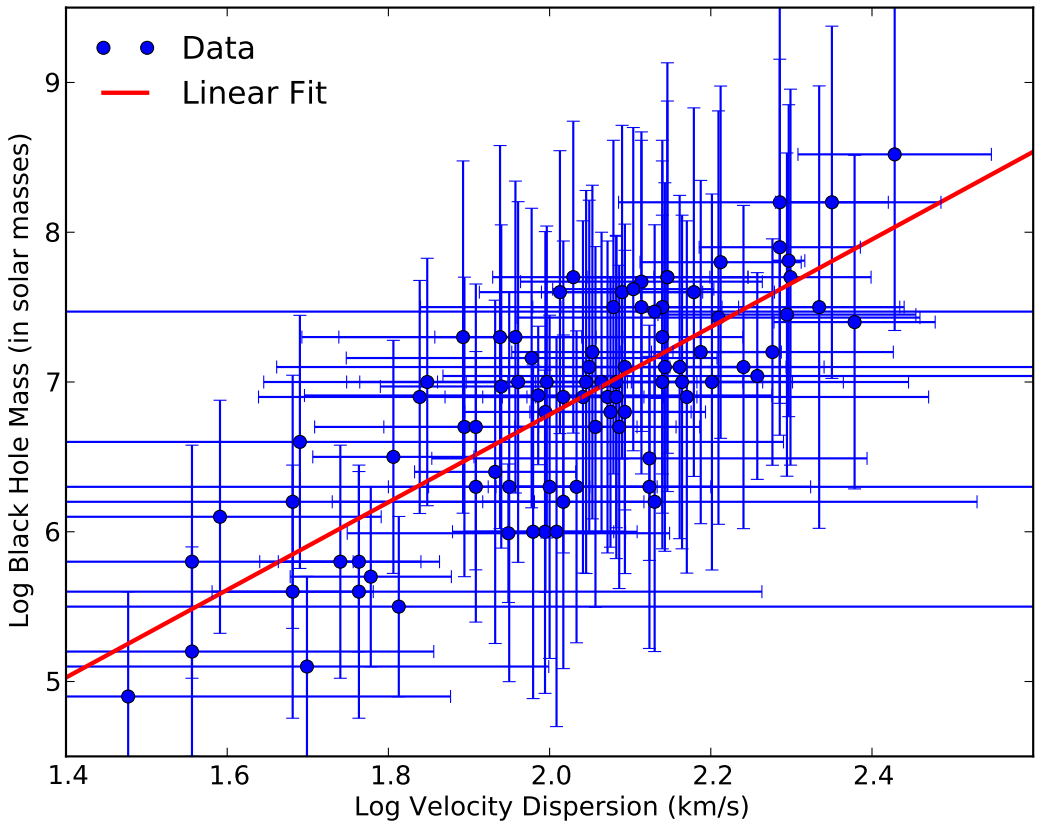

Figure 2: Plot of black hole mass vs velocity dispersion, with error, and of a linear regression of the data, ignoring any error. The bounds are set to roughly match those of Figure 1 on the worksheet,, that we might compare to Greene and Ho. Thw two are fairly close, but my fit is shallower. However, the difference is likely within my errors for a_1 and a_2.

(c)

a_1	σ_{a_1}	a_2	σ_{a_2}	χ^2
0.45531570777031338	8.0153868647554827	3.0911839820456084	4.1349645712187764	0.30261736586887894

Note that the errors in a_1 and a_2 are huge, larger than the values themselves, so the χ^2 of the fit is less than one, meaning we haven't actually really fit the data.

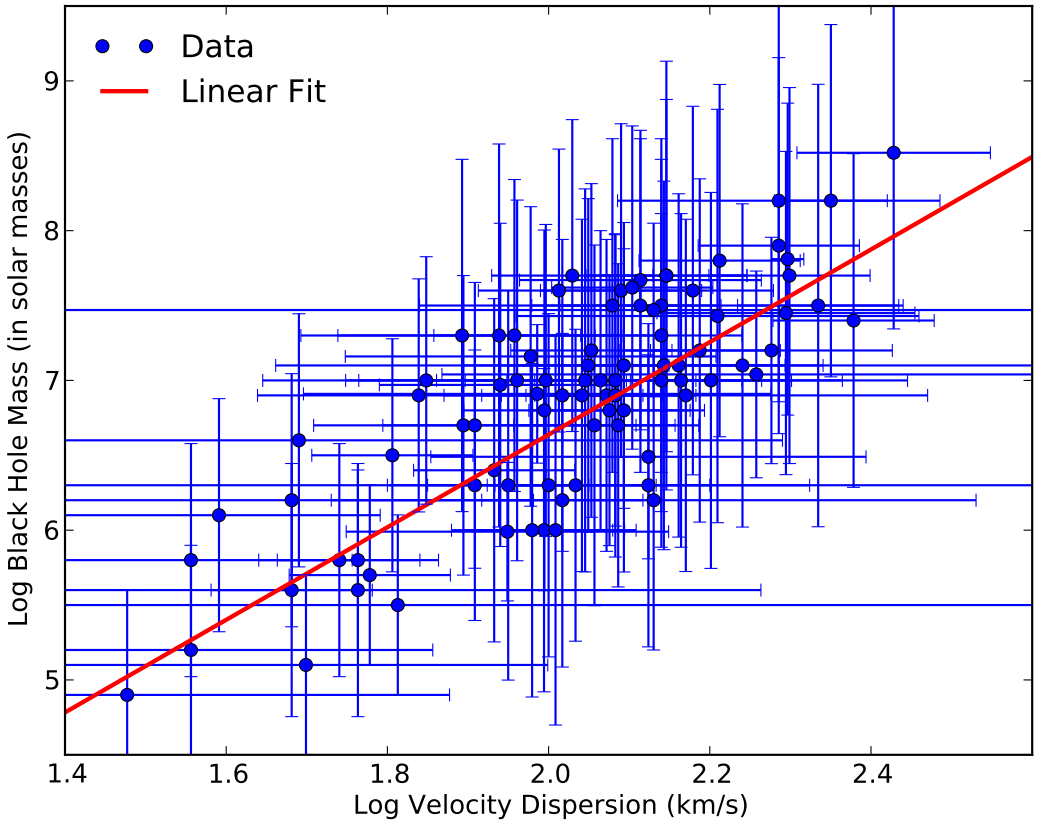

Figure 3: Plot of black hole mass vs velocity dispersion, with error, and a linear regression of the data using both of those errors. This seems to have brought the fit down in the y-direction from part b.