Pastry rating – multivariate linear regression

In a designed experiment pastries are prepared and rated by judges to assess how moisture content and sweetness of a pastry product affect a taster's rating of the product. The total sample size is $n = 16$. The response (outcome) variable is the rating of the pastry. The potential predictors are the moisture content and the sweetness. Compute a linear regression model.

Rating	*Moisture*	*Sweetness*
64	4	2
73	4	4
61	4	2
76	4	4
72	6	2
80	6	4
71	6	2
83	6	4
83	8	2
89	8	4
86	8	2
93	8	4
88	10	2
95	10	4
94	10	2
100	10	4

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- Linear regression tries to find a linear function of the predictors that estimates the response (outcome) as well as possible – in some distance measure.
- **What about assigning weight 10 to *Moisture* and 8 to *Sweetness*?**

Rating	*Moisture*	*Sweetness*	*Estimator* = **10** $*$ *Moisture* + **8** $*$ *Sweetness*
64	4	2	56
73	4	4	72
61	4	2	56
76	4	4	72
72	6	2	76
80	6	4	92
71	6	2	76
83	6	4	92
83	8	2	96
89	8	4	112
86	8	2	96
93	8	4	112
88	10	2	116
95	10	4	132
94	10	2	116
100	10	4	132

Home Work HW1130

- Assume in the pastry rating problem that pastry samples have different colors, and we also would like to asses the effect of color (Yellow, Red, or Purple) on the rating. Assume that the 16 samples have colors YYRPYRRPPPRRPPYY in the order they appear in the data set. Adjust the model and data to compute the best linear regression using three predictors: moisture, sweetness, color. (Listen to hint in class.)