

name: Solution.

1 (10 points). Here is data from experiment counting the radioactive decay of barium-137m:

Time	1	3	5	7
Count	578	317	203	118

(a) Using the least-squares regression equation

$$\text{Count} = 602.8 - (74.7 \times \text{Time})$$

find the predicted values for the counts.

(b) Compute the differences, observed count minus predicted count. How many of these are positive; how many are negative?

(c) Square and sum these differences that you found in part (b).

(d) Repeat the computations made in parts (a), (b), and (c) using the equation

$$\text{Count} = 500 - (100 \times \text{Time})$$

(e) Which of the two equations are a better predictor of the radioactive decay of barium-137m?

Time	(a) Count	(b) diff
1	528.1	49.9
3	378.7	-61.7
5	229.3	-26.3
7	79.7	38.1

$$(c) (49.9)^2 + (-61.7)^2 + (-26.3)^2 + (38.1)^2 = 8440.2$$

Time	Count	Diff
1	400	178
3	200	117
5	0	203
7	-200	318

$$(178)^2 + (117)^2 + (203)^2 + (318)^2 = 187,706$$

(e) The first line contains a smaller accumulation of error so it's a better predictor.