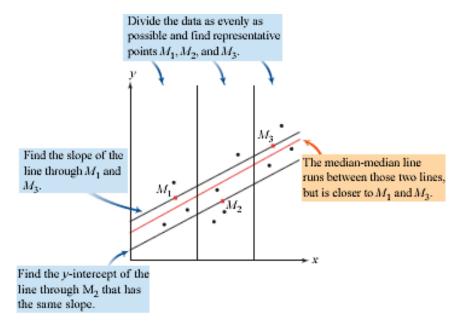Median-Median Line

Median-Median Line. A line of fit that is calculated by finding three points to represent the entire data set.

Divide the data as evenly as possible and find representative points $M_1, M_2,$ and M_3.

Find the slope of the line through M_1 and M_3.

M_3

M_1

M_2

The median-median line runs between those two lines, but is closer to M_1 and M_3.

Find the y-intercept of the line through M_2 that has the same slope.

Step 1. Order the data by domain values (x values). Divide the data into three groups making the first and third groups equal size.

Year	Deaths per hundred thousand
1924	15.5
1925	17.1
1926	18.0
1927	19.6
1928	20.8
1929	23.3
1930	24.5
1931	25.2
1932	21.9
1933	23.3

Step 2. Find the median x-values and the median y-values for the first and third groups of data and name these points M_1 and M_3 respectively.

$M_1 = (x_1, y_1) = ($, $)$

$M_3 = (x_3, y_3) = ($, $)$

Step 3. Find the slope of the line going through points M_1 and M_3. <u>This slope will be the slope of the median-median line</u>.

$$b = \frac{y_3 - y_1}{x_3 - x_1} =$$

Step 4. Using the slope found in Step 3, find the slope-intercept equation of the lines going through points M_1 and M_3 respectively (the y-intercepts through for lines through M_1 and M_3 are the same).

$y = y_1 + b(x - x_1)$ $y = y_3 + b(x - x_3)$

$a_1 =$ $a_3 =$

Step 5. Find the median x-value and the median y-value for the second group of data and name this point M_2.

$M_2 = (x_2, y_2) = ($, $)$

Step 6. Using the slope found in step 3, find the slope-intercept equation of the line going through M_2.

$y = y_2 + b(x - x_2)$ $a_2 =$

Step 7. Find the y-intercept of the median-median line by taking the <u>mean</u> of the y-intercepts of the lines going through M_1, M_2 and M_3 (the y-intercepts through M_1 and M_3 are the same).

$$a = \frac{a_1 + a_2 + a_3}{3} =$$

Step 8. Write the slope-intercept equation of the median-median line using the slope found in Step 3 and the y-intercept found in Step 7.