

Analysis:

1. Unconditional pay gap between men and women

We can see that the difference in unconditional weekly gender pay gap between men and women lawyers is **\$298 on average in 1027 observations**.

2. Viewing relationship between educational level and earnings for men and women



From the regression line in the plot from the markdown html, we can see that **men lawyers have higher earnings than women lawyers on all the education levels**, while the average earning of lawyers of both genders tend to **increase with higher education qualification**. We prove the upward sloping regression line by finding that the **correlation coefficient between educational level and average earnings of men lawyers is 0.78 and women lawyers is 0.80**. So, we can conclude that educational level and average earning for both men and women lawyers has a strong **positive correlation**, and the slope of regression line should be **upward sloping**, which aligns with the plot.

3. Finding the β_0 and β_1 to know how the expected earning change depending on educational level

We would like to find out the actual regression coefficients β_0 and β_1 when the average weekly earnings (y) being the dependent variable and educational level (x) being the independent variable.

From the markdown html, we can see the **β_0 , β_1 and Standard Error of $E(y|x)$ for men lawyers are \$-4406.09, \$138.91 and \$176.52 respectively**. This implies that the y-intercept when $x = 0$ is expected to be \$-4406.09, and with every 1 increase in x , y is expected to increase by \$138.91. While the SE is \$176.52, with a 95CI, we would expect any weekly earnings of random samples chosen will fall within ± 353.04 (taking ± 2 SE) away from the sample mean/regression line.

For women lawyers, we can see the **β_0 , β_1 and Standard Error of $E(y|x)$ for women lawyers are \$-4704.99, \$138.97 and \$172.22 respectively**. This implies that the y-intercept when $x = 0$ is expected to be \$-4704.99, and with every 1 increase in x , y is expected to increase by \$138.97. While the SE is \$172.22, with a 95CI, we would expect any weekly earnings of random samples chosen will fall within ± 344.44 (taking ± 2 SE) away from the sample mean/regression line.

Conclusion:

The difference of β_1 between men lawyers and women lawyers is similar (only 0.04% difference), so we can expect that the wage gap between men and women lawyers is **not likely to be closed by receiving more education**. And as the slope of regression line of men and women is similar, the sample difference of the **weekly earnings between men and women is expected to be close to the difference between the β_0 of men and women, which is \$298.9, throughout all educational levels**.