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Correlation and Regression Lab

USMSA Data Set-

1. There is not a linear relation between x(rank) and y(population), looking at the residuals we can see that there is a strong patterns indication a “lack of fit.”
2. The linear relation between ln(y) and x is also similar to that of x and y, looking at the value of r and the residuals we can see that that is a strong pattern.
3. With ln(y) and ln(x) there is not a strong pattern and therefore a linear relation.
4. The 9th through the 75th are more likely to show strong linear relationships unlike before because the data is now more equal. The value of r and the residual plots would be far more scattered.
5. The functional relation between x and y is represented by the formula y=mx+b and will always have some sort of linear relation, as you increase the rank the population will get smaller creating a negative curve.

Semi- Conductor Data Set-

1. In order to find uniformity for the polysilicon thickness for all sites you would use the average and standard deviation for all each site L1 to L13. The standard deviation tells you how close each site’s thickness is to each other.
2. Site 13 in each wafer is nearly 200 angstroms less than all the others. This site tends to throw off the data and therefore this site could be excluded from the data. There could be multiple reasons for the deficit that this site had compared to the other sites, but either way it is not necessary to have it with the rest of the data.
3. After getting the data analysis, M1=-.072 M2=1.21 and B=115.86 and therefore would fit into the equation y=m1x1+m2x2+b. y=-.072x1+1.21x2+115.86.
4. The output were getting from excel is two football shaped graphs which shows a good fit. The residuals show scattered points throughout and therefore show a strong linear relationship.
5. The coefficient M1= -.072, which represents oxide thickness, is close too close to zero and therefore not large enough to play a major role in determining the measure of polysilicon. M2, which represents deposition, is equal to 1.21 therefore showing a much more significant impact in measuring of thickness. Deposition time plays a much larger role in the measurement of oxide thickness.