



# Processing the Processors



Gordon Moore made his famous observation in 1965, just four years after the first planar integrated circuit was discovered. The press called it *Moore's Law* and the name has stuck. In his original paper, Moore observed an exponential growth in the number of transistors per integrated circuit and predicted that this trend would continue. Through Intel's relentless technology advances, *Moore's Law*, the doubling of transistors every couple of years, has been maintained, and still holds true today. Intel expects that it will continue at least through the end of this decade. The mission of Intel's technology development team is to continue to break down barriers to *Moore's Law*.

Since Moore stated that the doubling of transistors every year has been maintained, let's look at the growth in the number of transistors per integrated circuit over time.

- ④ visit Intel's website: <http://www.intel.com>
- ④ scroll down to **About Intel** and click on the link to **Intel Research and Development**
- ④ click on the **Intel Research** link on the left
- ④ from there roll over **Silicon Showcase & Nanotechnology** and select **Moore's Law**

Clearly these data are NOT linear.

1. Transform the response variable by taking the *log* of each value.
2. Make a scatterplot of *log* response vs. explanatory.
3. What do you observe?
4. Do you think a linear model will be appropriate? Why or why not?
5. Perform a linear regression using the transformed data. Interpret the slope. (be careful here, your response variable is NOT number of transistors per integrated circuit, but *log* of the number of transistors per integrated circuit)
6. Give the correlation coefficient, coefficient of determination, and correct interpretation of the coefficient of determination (again, be careful)
7. Examine a residual plot. Is this model still appropriate? Why or why not?
8. Transform the equation by UNDOING the transformation from step #1.
9. Use this equation to predict the number of transistors per integrated circuit in the year 2010.
10. Does your prediction seem reasonable? Explain?

Write an article for a technology or business magazine discussing your findings and conclusions. Your results should be typed, double spaced, 12 point Times New Roman, 1" Margins. Center any graphs. You may add addition graphics or pictures.