1. Wages Data

1a. Wage vs Age-When I plotted Wage against Age, the pattern wasn't a straight line at all. Wages go up as people get older, peak somewhere around mid-career, and then start dropping off. So a simple linear model doesn't really make sense; the curve is way too obvious to ignore.

1b. Linear Model- Age is not significant. Education is strongly significant.

Adjusted R-squared = 0.6088.

Overall, the linear model just doesn't match what the plot shows.

1c. Quadratic Model-Once I added the Age² term, everything clicked: Age was positive, Age² was negative exactly what you'd expect for a rise-and-fall pattern. Education stayed significant.

Adjusted R² jumped to 0.8257, which is a huge improvement.

This model clearly fits the data way better.

1d. Predicted Wages for Education = 16

Age 30: 25.85

Age 50: 31.54

Age 70: 26.56

Wages peak around the middle of most people's career

1e. Age That Maximizes Wage-Maximizing age: 50.67 years

Maximum predicted wage: 31.54

2. Ann Arbor Rental Data

2a. Scatterplots

Beds vs Rent: barely a trend

Baths vs Rent: a little stronger

Sqft vs Rent: easily the strongest relationship

Once I tried log-transformations, the relationships looked way cleaner and more linear.

2b. Regression Model

logSqft and Beds are significant predictors of rent.

Baths is not significant.

Adjusted R-squared = 0.8497.

The model fits very well.

2b. Predicted Rent for 1600 sqft, 3 beds, 2 baths

Predicted log(Rent): 7.3040

Predicted Rent: 1486.24

Prediction interval: 1143 to 1932