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Sample analysis: Logistic regression

Background

The owner of a car dealership wants to find out what factors predict whether a customer buys a car or not. Over a weekend they ask 50 customers how old their current car is, whether it is the same make a sold at the dealership, the age of the customer and their annual income.

Analyses conducted

The primary analysis conducted was a logistic regression. This type of regression model allows us to predict a binary outcome (buy car vs. not buy car) from a number of variables. The predictor variables were: current car same make (yes or no), age of current car (years), age of customer (years) and the annual income of the customer.

Results

The logistic regression model was able to accurately predict whether a customer brought a car for 84% (42 out of 50) of the participants. The overall model was significant (X^2 (4) = 31.1, p < .001) meaning that it provides a good predictive model of whether someone goes ahead with a purchase.

Looking at each of the predictors separately, we can see the following:

- *Previous car of same make*: If the customer already owns a car of the same make as the one that they are considering buying, they are significantly more likely to go ahead with the purchase (B = -2.1, W (1) = 5.5, p = .019)
- *Age of previous car*: The older the car that the customer currently drives, the more likely they are to go ahead with the purchase (B = 0.4, W (1) = 4.5, p = .035)
- *Age of customer*: Age of the customer does not predict purchase (B = 0.1, W (1) = 1.4, p = .229)
- *Income*: A person with a higher income is significantly more likely to purchase a car (B = 0.1, W (1) = 4.2, p = .041)

The significant predictors of buying a car, placed in order of importance from most to least, are:

1. Already owning a car of the same make as the one they are considering purchasing
2. Having an older car
3. Having a high income