# Forecasting chicken wing Demand

1. Week 7 forecasted demand (five period moving average):
   1. (596+514+735+563+521)/5 = **585.8**
2. Week 7 forecasted demand (three period weighted moving average):
   1. (596\*0.5)+(514+0.3)+(735\*0.2) = **599.2**
3. Week 7 forecasted demand (exponential smoothing a=0.1):
   1. 600+0.1(596-600) = **599.6**
4. In all three of these forecasting techniques we are assuming that there is no seasonality to the demand for chicken wings. In part A we are assuming that only the past five weeks are of importance in forecasting the next week and we also assume that each week should have equal weight in deciding the next week’s demand. In part B we assume only the last 3 weeks will determine the demand for the next week, we also believe that the more recent the week the more weight that week has on the demand. In part C we include the previous weeks forecast in our calculation and also compare it to the actual to identify the demand for the next week.

# Forecasting tire demand

1. See Excel file
2. See Excel file
3. We can see from this problem that no prediction algorithm is perfect and a good formula can become a not so good formula in just a few time stamps. For the first seven days the smoothing model with an alpha value of .3 was the best model. But the second seven days it was surpassed by the model with an alpha value of .2 by just a small amount when using MAD as a selection criterion.

# Predicting household income with logistic regression

* 1. Coefficients
     1. The model that I produced in the attached R script, all of the fields within the acs\_ny dataset minus FamilyIncome. To be expected many of the included fields within the model were not statistically significant. The fields that were included NumBedrooms, NumPeople, NumRooms, NumUnits, NumVehicles, NumWorkers, HouseCosts, ElectricBill, FoodStamp, and Insurance to the 0 significance level. Beyond these fields there were more that were significant to this level and even to the .05 significance level, but most of there were dependent on the value returned within the field and not all values were significant. One example of this would be the field Acres, if the value for a record was Sub 1 then there was significance to its value otherwise there was not. Most of the coefficients with high significance level have a positive effect on the model.
  2. AIC
     1. The AIC for this model is quite high at 17066. To improve this, I would likely limit the amount of variable within the model starting with the one with no or little significance.
  3. Deviance residuals
     1. The null deviance of 22489 on 22744 degrees of freedom is higher than our residual deviance of 16978 on 22701 degrees of freedom. This mean that our model is more effective than if we did not include the coefficients at all.

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