**Honda Civic Hybrid Hypothesis**

Honda has history of environmental leadership and the company has carried its tradition

along by getting recognized as country’s greenest automaker by the Union of

Concerned Scientists (UCS). The Honda’s most innovative offering has been with Civic

Hybrid. The company boasts of providing advantage of all the gas-saving technology in

the new Civic Hybrid and an estimated mileage one can get on the highway is 44 mpg.

The vehicle comes with a quick and easy way to boost efficiency in the form of the

ECON button. When the button is pushed, the engine and other power-using system go

into super-efficient mode to maximize the mileage.

However, not all customers would agree to the mileage provided by Honda for its Civic

Hybrid. Many of them believe that the mileage is quite disappointing which might be due

to some manufacturing quality issue with the Honda Civic Hybrid (HCH) and particularly

the CVT that is causing high rate of low mileage experiences when compared with other

make and model hybrids. A step further in this analysis can be that there might be

design issues in the HCH with respect to keeping batteries cool. A direct comparison of

this point can be had with diesel-electric-hybrid buses where the biggest issue for

performance of the hybrid drive on the vehicles which have been tested is temperature

control. If batteries get too hot, they do not recharge and the bus runs effectively on

diesel alone. In fact, some of the buses tested had worse mileage than conventional

models running on the same route.

Hence, from the above analysis, we can form a hypothesis for Honda Civic Hybrid

which is:

H0: The temperature of the city in which HCH is driven has direct impact on the mileage

of the vehicle.

**Data Collection**

To validate the hypothesis we would need to collect data related to average

temperature and humidity level of different sample cities along with humidity range for

the average mileage reported by HCH users in these cities. The data would have to be

collected for a particular month but cities would be chosen in such a way that there is

variation in the weather conditions among them. Hence, for a selected sample of 5

different cities we would have the data for a month for temperature and humidity and

mileage. For each sample we can calculate the mean mileage. Using ANOVA we would

be able to determine if there is a statistical difference among this data across different

cities. Through the ANOVA test we would also get to know whether or not the means of

several groups are equal.

**Data Analysis**

The total variation is comprised of the sum of the squares of difference of each mean

with the grand mean (total of all data values divided by the total sample size). There is a

between group variation and within group variation. The whole idea behind the analysis

of variance is to compare the ratio of between group variance to within group variance.

These variations are denoted by Sum of Squares Between Groups SS (B) and Mean

Square Between Groups MS (B). Similarly, SS (W) and MS (W) is the within group data.

Using this data we can calculate the Mean Square and find the F-value which is the

ratio of mean squares. If the between variance is smaller than the within variance, then

the means are really close to each other and we will fail to reject the claim that they are

all equal.

Hence if means are equal we would fail to reject the hypothesis that gas mileage is

affected by the external temperature and conclude that there is an effect of external

temperature on the mileage of the hybrid car.

If one of the means is different we would reject the null, and conclude that there is no

interdependence of external temperature and mileage of the vehicle.