

Hypothesis Testing on the Electric car usage

Electric cars are vehicles that use a battery-powered electric motor or a fuel cell. Many electric vehicles cover 10 kWh between 80 and 100 kilometers. A low energy loss means they are not very energy-intensive. The concern about greenhouse gas emissions and their contribution to global warming is one of the main reasons for the introduction of electric cars into the market. Creating electric cars that reduced or eliminated exhaust emissions was intended to help combat this issue.

1.Problem Statement

Our research problem is investigating the use of electric cars (blue cars) from the Autolib dataset given.

Hypothesis testing is performed to help determine whether the variation between or between data groups is due to true variation or the result of variation in the sample.

Hypothesis testing is used to infer from a larger population, the result of a hypothesis carried out on sample data.

Null Hypothesis: Probability that the number of blue cars taken in one weekend is greater than or equal to the probability of blue cars being returned the weekend

Alternative Hypothesis: Probability that the number of blue cars taken in one weekend is less than the probability of blue cars being returned in the weekend

2.Data description

It's a dataset which is composed of a daily aggregation of the number of events on the Autolib network (car-sharing and reloading) by date and postal code.

The car sharing business began in Paris for the first time and was the start of what is still the world's largest urban electric car sharing scheme, allowing drivers to rent a car at one location and return it to another location. Other car-sharing schemes have generally not used electric cars, and usually the driver has to return the car to the place where he rented it.

The dataset has a total of 13 columns

RangeIndex: 16085 entries, 0 to 16084

dtypes: int64(11), object(2)

3.Hypothesis testing procedure

I used Simple random sampling to collect a sample for my study, which will be used to measure the test statistics to help determine which conclusion to infer.

A null hypothesis claims that there is no statistical significance between variables while a statistically significant relationship exists between two variables as the Alternative hypothesis states.

For my test hypothesis I used poisson distribution. Testing hypotheses with the Poisson distribution is very similar to testing them with the binomial distribution. If the probability

is greater than α , the level of significance, then the null hypothesis is accepted. If it is less than α , we accepted the alternative hypothesis

4.Hypothesis Testing Results

From the poisson distribution, we can see that the probability of blue cars returned ($4.02284742e-08$) is less than the probability of blue cars taken ($1.73061863e-07$) in one weekend.

Therefore, we reject the null hypothesis and accept the alternative that probability of blue cars taken in one weekend is less than the probability of blue cars being returned in the weekend

5.Conclusion and Recommendations

A Lot more can be done to further better understanding of the electric car usage. A predictive model could be used to gauge the possible future of the blue cars.

Comparing the usage of the various vehicles could help further gauge the customer preferences and work on meeting all requirements to increase the numbers of customers.