**Statistical Hypothesis Testing on Autolib Bluecars**

1. **Problem Statement**

Autolib is a company that offers car sharing services with focus on the blue cars offered by it. The dataset used is<http://bit.ly/DSCoreAutolibDataset> and focus is on the number of blue cars taken on weekends. The null hypothesis is that the average number of blue cars taken is the same on Saturdays and Sundays, while the alternate states the average number of blue cars taken on Saturdays is less than that of Sundays. This is to determine which day of the weekend has more blue car renting traffic than the other.

1. **Data Description**

The data necessary to run this test will be the day of the week and the number of blue cars taken each day with our main focus on Blue Cars taken. The data is collected by Autolib and to choose a sample from this data we use stratified sampling to enable us to focus on weekends only and not weekdays.

1. **Hypothesis Testing Procedure**

**Z-Test for a Mean**

**Step 1: State the hypothesis and identify the claim**

The claim is that the average number of Blue Cars taken on Saturdays is less than that of Blue Cars taken on Sundays. At alpha = 0.05(significance level : 0.05) it can it be concluded that the average is less on Saturdays than Sundays based on a sample of 1300 records(sample size : 1300)?

H0: mu = population mean

H1: mu < population mean(claim)

Kindly note: the population mean is derived from the notebook

population mean : 81.88667640501268

**Step 2: Find the critical value**

critical\_value 1.6448536269514729

**Step 3: Compute the z-statistic**

Sample mean : 85.18846153846154

population standard deviation : 88.92803650098463

z\_statistic : 0.0512485788574449

1. **Hypothesis Testing Results**

**Step 1: Conclusion(decision to reject or not reject the null hypothesis)**

We do not reject the null hypothesis as the z-statistic doesn’t fall beyond the critical value, that is, the rejection region.

**Step 2: Results Summary**

We will not reject the null hypothesis since there is not enough statistical evidence to support the claim that the average number of Blue Cars taken on Saturdays is less than that of Sundays.

1. **Discussion of Test Sensitivity**

The sample size selection is determined by the avoidance of a big type 1 error. The bigger the sample size, the smaller the probability of acquiring a type 1 error and this way increasing the power of our test. Therefore, changing our sample size would directly affect the power of our test.

1. **Summary and Conclusions**

There are some days where the data on weekends was not input and this may lead to some errors in our test.