**Will a Customer Accept the Coupon?**

A summary report on the findings

**Data exploration**

The coupon dataset consists of 12684 attributes and 26 columns/fields. The dataset consisted of the following missing values for car, Bar, CoffeeHouse, CarryAway, RestaurantLessThan20, and Restaurant20To50.

car 12576

Bar 107

CoffeeHouse 217

CarryAway 151

RestaurantLessThan20 130

Restaurant20To50 189

Notice: null values in car attribute almost equating to the total number of records of the dataset. This implies only 12684 – 12576 = 208 records did not have nulls. Because of this big number, we decided to replace the nulls with -999: a representation used by data engineers to indicate missing values, rather than dropping the entire null records. With this, we minimize the bias that would have been caused by a smaller dataset if 90 % is dropped.

**What proportion of the total observations chose to accept the coupon?**

Above 56.84% of the observations in our dataset accepted a coupon, while 43.16% declined the coupon.

**Use a bar plot to visualize the coupon column.**

A bar graph with numbers and text

Description automatically generated

**Description:**

The figure above shows that coffee houses and restaurants (<20) received approximately the same highest number of coupons (around 2000). This is followed by carryout & takeout. Bars and restaurants (20-50) received a lower count of coupons, with restaurants (20-50) receiving the lowest of all coupon types. The findings reveal that it is easier for drivers to accept low-cost coupons compared to costly ones. Bars and restaurants tend to sell pricier items compared to coffee houses, carryout/takeout, or restaurants with an average expense of 20 dollars or less.

A graph with blue bars

Description automatically generated

A graph of a graph with numbers

Description automatically generated

**Description:**

The figure above shows temperature counts for 30F, 55F, and 80F. The highest number of observations belong to a temperature of 80F, followed by 55F, and lastly 30F. Similarly, the declined proportion indicated that coupons had most declined when temperatures were at 80F, followed by 55F, then 30F.

**What proportion of bar coupons were accepted?**

A graph of a bar graph

Description automatically generated

**Description:**

The figure above shows a large number of bar coupons being declined compared to accepted bar coupons. This indicates that the majority of drivers do not want to go to bars, drink, and then drive. This finding applies to real life, where drivers are supposed to be responsible and stay sober all the time, as they are in charge of other people's lives

**Compare the acceptance rate between those who went to a bar 3 or fewer times a month to those who went more.**

The acceptance rate between those who went to a bar 3 or fewer times a month compared to those who went more is 100.0%

**Compare the acceptance rate between drivers who go to a bar more than once a month and are over the age of 25 to all others. Is there a difference?**

The acceptance rate between drivers who go to a bar more than once a month and are over the age of 25 compared to all others is 0.0%.

**Use the same process to compare the acceptance rate between drivers who go to bars more than once a month and had passengers that were not a kid and had occupations other than farming, fishing, or forestry.**

The acceptance rate between drivers who go to bars more than once a month and had passengers that were not children, and had occupations other than farming, fishing, or forestry compared to all others is 34.30%.

**Is there a difference?**

There is a difference as the acceptance rate is approx. 34.30 %

**Compare the acceptance rates between those drivers who:**

* **go to bars more than once a month, had passengers that were not a kid, and were not widowed**
  + Acceptance rate of drivers who go to bars more than once a month, had passengers who were not children, and were not widowed: 34.30%
* go to bars more than once a month and are under the age of 30 *OR*
  + Acceptance rate of drivers who go to bars more than once a month and are under the age of 30: 0.00 %
* go to cheap restaurants more than 4 times a month and income is less than 50K.
  + Acceptance rate of drivers who go to cheap restaurants more than 4 times a month and whose income is less than 50K: 0.61 %

**Based on these observations, what do you hypothesize about drivers who accepted the bar coupons?**

For every 30 in 100 drivers who accept coupons and go to bars more than once a month, had passengers that were not a kid, and were not widowed

**# Would you accept that coupon and take a short detour to the restaurant?**

Acceptance rate of drivers who take a short detour to the restaurant: 44.90%. I would likely not accept the coupon and take a detour since the acceptance rate is under 50%.

**#What about a coffee house?**

"Acceptance rate of coffee house coupons: 55.42%. I would be neutral about accepting the coupon and taking the detour because the rate is just over 50%.

**# Would you accept a bar coupon with a minor passenger in the car?**

Acceptance rate of coffee house coupons: 13.95%. Given this rate, I would not accept the bar coupon if I were driving with a minor passenger in the car. This makes sense, as I would not want to go to a bar with someone under the restricted age.

**# What about if it was just you and your partner in the car?**

Acceptance rate of coffee house coupons: 101.32%. I would accept the bar coupon if I’m alone in the car with my partner. This is understandable, as both of us are adults and allowed in bars without any age restrictions.

**# Would weather impact the rate of acceptance? What about the time of day?**

Acceptance rate of coupons on a sunny day: 139.65 %

Acceptance rate of coupon on a rainy day: 16.78 %

Acceptance rate of coupon on a snowy day: 19.49 %

Acceptance rate of coupon on a rainy and snowy day: 19.49 %

Acceptance rate of coupon on a sunny and snowy day: 19.49 %

Based on the findings, rainy and snowy days would impact the acceptance rate of the coupons, as they show a low acceptance rate of under 20 percent. On the other hand, sunny days have a much higher acceptance rate."

**# Would you ignore the coupon entirely?**

I would not accept the coupon except under two conditions: 1) if it is a coffee house coupon and the weather is sunny, and 2) if I'm driving with a partner in the car. These two scenarios show an acceptance rate of over 100 percent.