***Background:***

Data stored in a csv file was analyzed to answer the following question:

*Will the customer accept the coupon?*

There were five different types of coupons for the following places:

1. less expensive restaurants

2. coffee houses

3. carryout and takeaway

4. bars

5. more expensive restaurants

The data was collected via a survey that described different driving scenarios, like for example, the destination, current time, weather, and passenger, etc. and then asked people whether they will accept the coupon if they were the driver.

There were three possible answers people could choose from:

1. “Right away”

2. “Later, before the coupon expires”

3. “No, I do not want the coupon”

***Histograms Observations***

*Destination and Passenger*

Coupons were more likely to be accepted when the destination was ‘No Urgent Place’(63%). The chances were about even for those going to work (51%) or home (50%).

When Friend(s) (67%) or a Partner (59%) was the passenger of the car, coupons were more accepted compared to when Alone (52%) or Kid(s) (50%) were the passenger.

*Weather and Temperature*

Coupons were more accepted during sunny (59%) weather and temperatures of 80 (60%), 55 (54%) and 30 (53%) compared to rainy (46%) and snowy (47%) weather.

The temperature histogram showed that the acceptance of coupons increased exponentially as the weather warmed up. This could be investigated further with a regression analysis.

*Time and Coupon*

There was more acceptance of coupons at 10AM (61%), 2PM (66%), 6PM (58%) as opposed to 10PM (51%) and in the morning at 7AM (50%). 10AM to 2PM would seem to be the prime time for the acceptance of coupons.

‘Carry out & Take away’ (73%) and ‘Restaurant(<20)’ (71%) were the popular coupons against ‘Coffee House’ (50%), ‘Restaurant (20-50)’ (44%) and ‘Bar’ (41%).

*Expiration and Gender*

Coupons with 1d expiration (62%) were favored against 2h (50%).

While both female (55%) and male (59%) were likely to accept coupons, males were more likely to accept coupons.

*Age and Marital Status*

Those whose ages were below 21 (63%), 21 (60%), 26 (60%) were more likely to accept coupons compared to 31 (55%), 36 (54%), 41 (57%), 46 (57%) and above 50 (51%).

Single (60%), unmarried (56%) and married partners (54%) were likely to accept coupons compared to divorced (52%) and widowed (48%).

*‘Has\_children’ and Education*

Those with no kids (59%) were more likely to accept coupons than those with kids (54%).

‘Some high school’ (72%), ‘Some college – no degree’ (60%) and ‘High School Graduate’ (59%) were more likely to accept coupons compared to ‘Bachelors degree’ (55%), ‘Associate Degree’ (55%) and ‘Graduate degree (Masters or Doctorate) (52%).

*Occupation*

The occupations more likely to accept coupons were led by Healthcare Support (70%), Construction & Extraction (69%), Healthcare Practitioners & Technical (68%), Protective Service (64%), Architecture & Engineering (63%), Production Occupations (62%), Student (61%), Office & Administrative Support (60%), Transportation & Material Moving (60%), Building & Grounds Cleaning & Maintenance (59%), Management (59%), Food Preparation & Serving Related (58%), Life Physical Social Science (58%), Business & Financial (57%), Computer & Mathematical (57%) and Sales & Related (56%). Those who were unlikely to accept coupons: Community & Social Services (49%), Legal (47%), Retired (46%)

*Income*

Coupons were likely to be accepted at the following income levels: ) 0 to less than 12500 (59%), 12500 to less than 25000 (57%), 25000 to less than 37500 (59%), 37500 to less than 50000 (56%), 50000 to less than 62500 (59%), then became less likely at 62500 to less than 75000 (52%), went down at 75000 to less than 87500 (48%) and then went up a little bit at 87500 to less than 100000 (53%) and higher at more than 100000 (58%).

*‘Bar’ and ‘Coffeehouse’*

‘Bar’ coupons were more likely to be accepted for ‘4-8’ (64%), ‘1-3’ (62%), ‘gt8’ (58%), ‘less1’ (56%), ‘never’ (53%) and ‘0’ (51%).

‘Coffeehouse’ coupons were popular for ‘1-3’(65%), ‘4-8’ (63%), ‘gt8’ (58%), ‘less1’ (54%), and ‘0’ (51%) but unlikely for ‘never’ (46%).

*‘Carryaway’ and ‘Restaurantlessthan20’*

‘Carryaway’ coupons were accepted more at ‘0’ (67%), ‘4-8’ (58%), ‘1-3’ (58%), ‘gt8’ (57%), ‘never’ (53%) and less at ‘less1’ (50%).

‘Restaurantlessthan20’ coupons were accepted more at ‘0’ (69%), ‘gt8’ (61%), ‘4-8’ (58%), ‘1-3’ (56%), ‘never’ (53%) and ‘less1’ (53%).

*‘Restaurant20to50’ and ‘Tocoupon\_geq5min’*

‘Restaurant20to50’ coupons were more likely to be accepted for ‘gt8’ (66%), ‘4-8’ (66%), ‘1-3’ (59%), ‘less1’ (56%), ‘0’ (56%) and ‘never’ (52%).

‘Tocoupon\_geq5min’ was likely to accept coupons (57%) at ‘1’. There was no data on ‘0’.

*‘Tocoupon\_geq15min’ and ‘Tocoupon\_geq25min’*

‘Tocoupon\_geq15min’ was likely to accept coupons at ‘0’ (61%) and ‘1’ (53%).

‘Tocoupon\_geq25min’ was likely to accept coupons at ‘0’ (59%) but unlikely to accept coupons at ‘1’ (42%).

*‘Direction\_same’ and ‘Direction\_opp’*

‘Direction\_same’ was accepting coupons at ‘1’ (58%) and ‘0’ (56%). ‘Direction\_opp’ was the opposite as expected.

**Scatter Plot of Income vs. Age**

The plot showed the following:

1. Most 16-year olds would accept coupons spread over the income levels.

2. Forty-year olds and above would accept coupons at low income level.

3. Most 26-year olds would not accept coupons at almost all income levels save for the highest income level.

4. Most 50-year olds would accept coupons spread over all income levels especially at high income levels.

5. At low income level, 26-year olds to 36-year olds would not accept coupons while 16-year olds and 21-year olds would.

**Next steps**

It is recommended to identify a suitable classification or regression model based on the features earlier analyzed to confidently predict who are most likely to accept coupons.

*References:* Jupyter Notebook “2Accept\_Coupons.ipynb”