



***What factors affect airline customer satisfaction?***

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*Project Proposal*



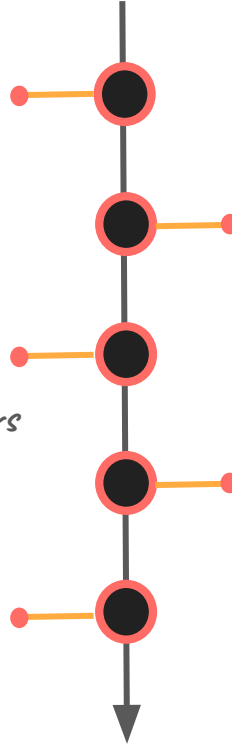
**03**

*Deep Dive in critical factors*



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*Conclusion & Takeaways*



**02**


*Explore Data*




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## Data Source




 Dataset

# Airline Passenger Satisfaction




What factors lead to customer satisfaction for an Airline?

 TJ Klein • updated 2 years ago (Version 1)

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 Usability 8.8  License Other (specified in description)  Tags tabular data, classification, binary classification, clustering

(Source: <https://www.kaggle.com/teejmahal20/airline-passenger-satisfaction?select=train.csv>)

## ***Business Situation***

### **BUSINESS PROBLEM:**

Travel demand increase due to Covid-19 rate drop

Customer satisfaction is important for Airlines to attract more customers.

### **OUR SOLUTION:**

Exam the relations between flight related factors and U.S. passengers' satisfaction

- Analyze and visualize relationships between the categorical variables (like bag handling, Wifi service) and the satisfaction.
- Explore leading causes .
- Predict (logistic regression) the factor that Airlines need to the pay most attention to.

# *Data description: US Airline passenger satisfaction survey*

## FACTORS AFFECTING SATISFACTION



Inflight wifi service



Departure/Arrival time convenient



Ease of Online booking



Gate location



Food and drink



Online boarding



Seat comfort



Inflight entertainment



On-board service



Leg room service



Baggage handling



Checkin service

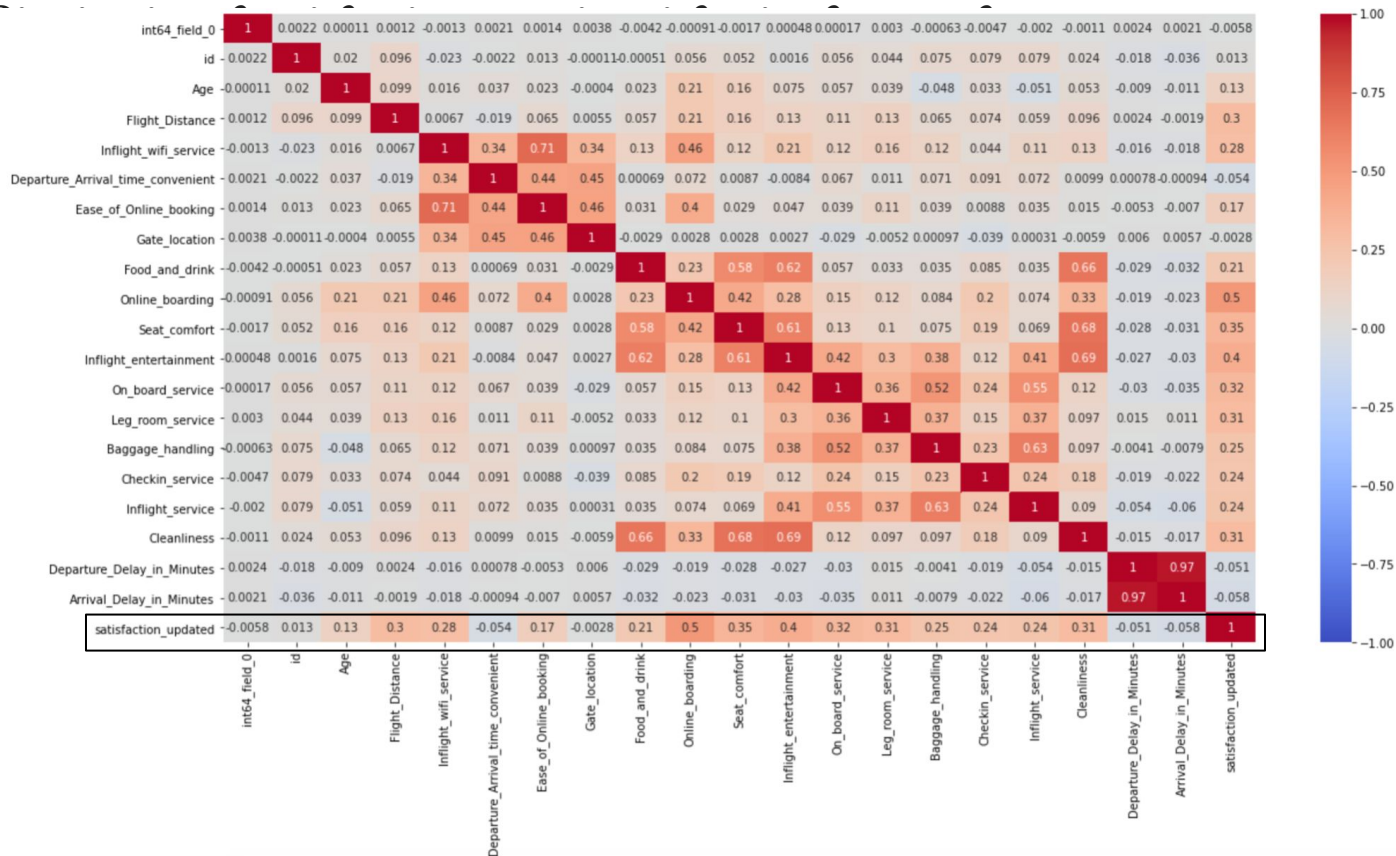


Inflight service

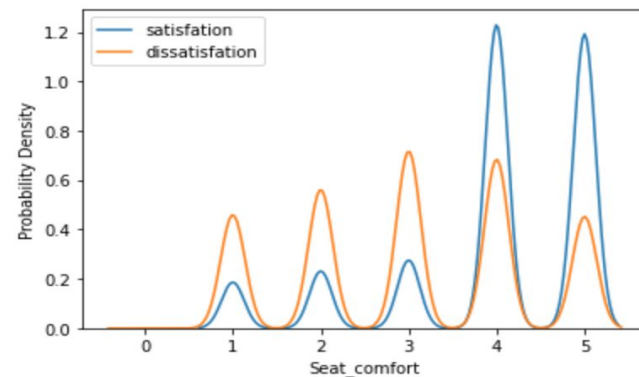
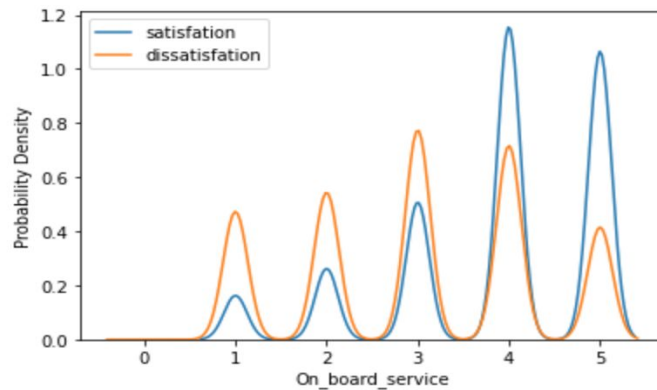
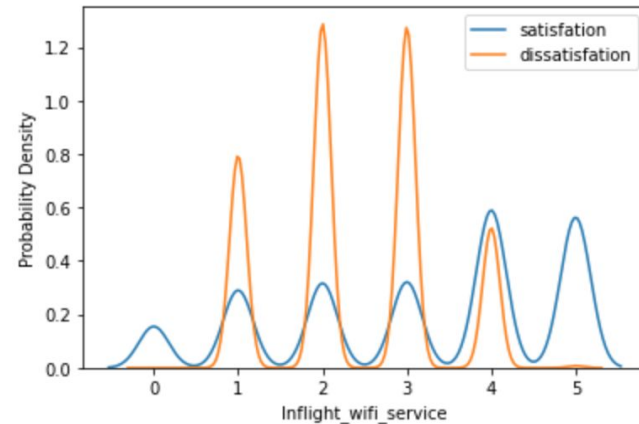
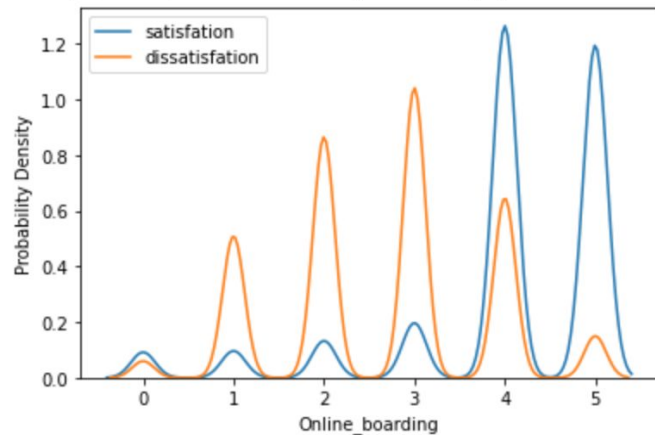


Cleanliness

# Correlation Heatmap



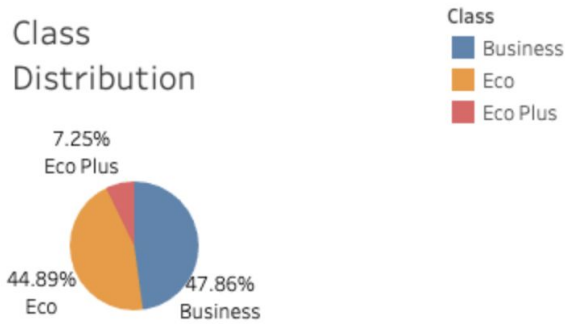
## Key Factors



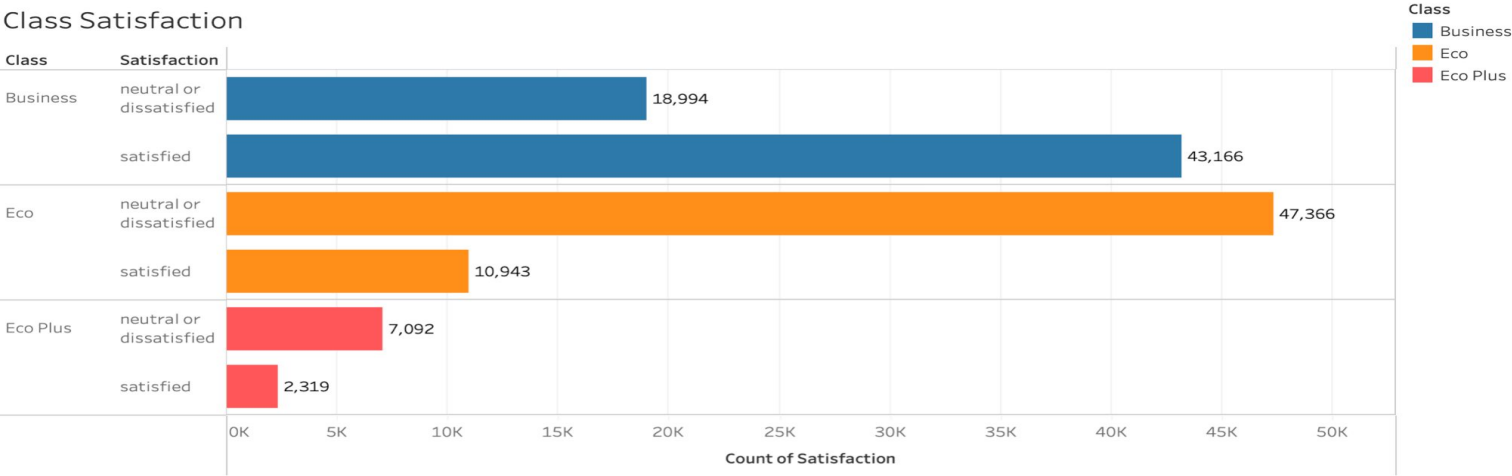
which service the airline does the best?

*What are the leading factors that make passengers of particular travel type dissatisfied or satisfied?*

Class  
Distribution

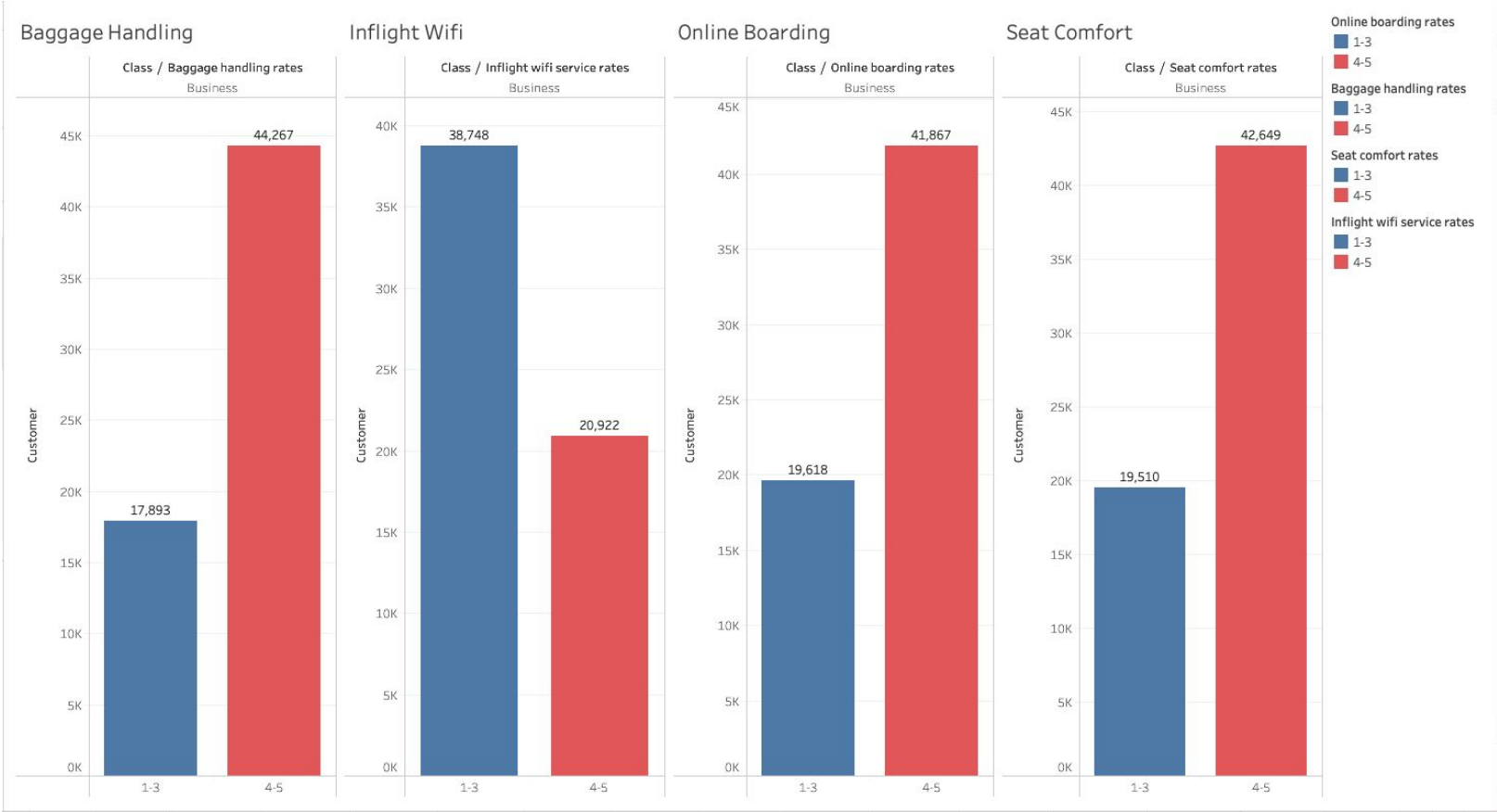


Class Satisfaction



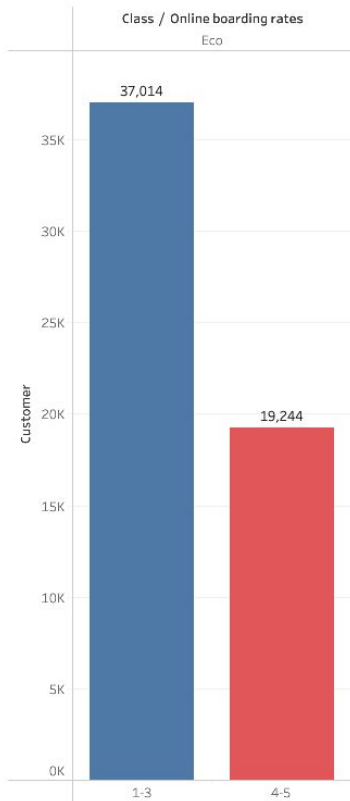


# Customer Ratings for Business Class

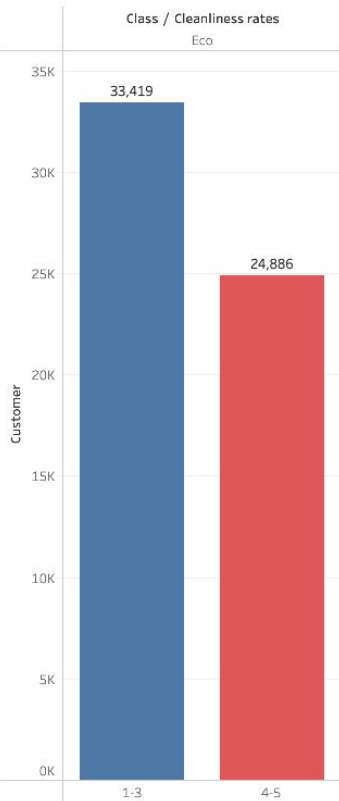


# Customer Ratings for Economy Class

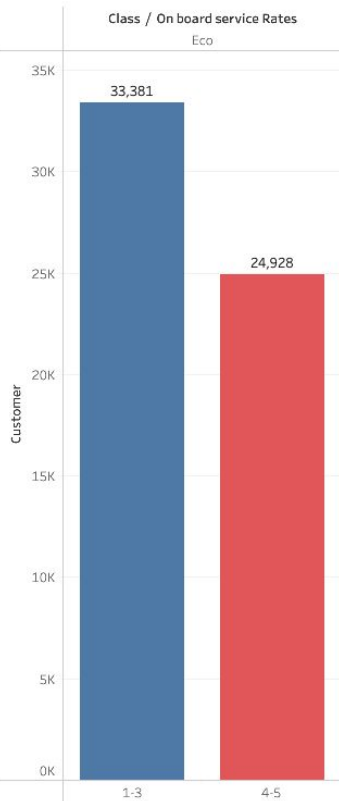
Online Boarding



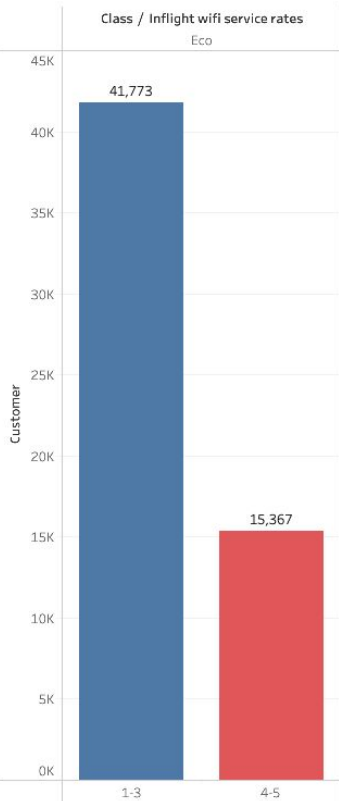
Cleanliness



On Board Service

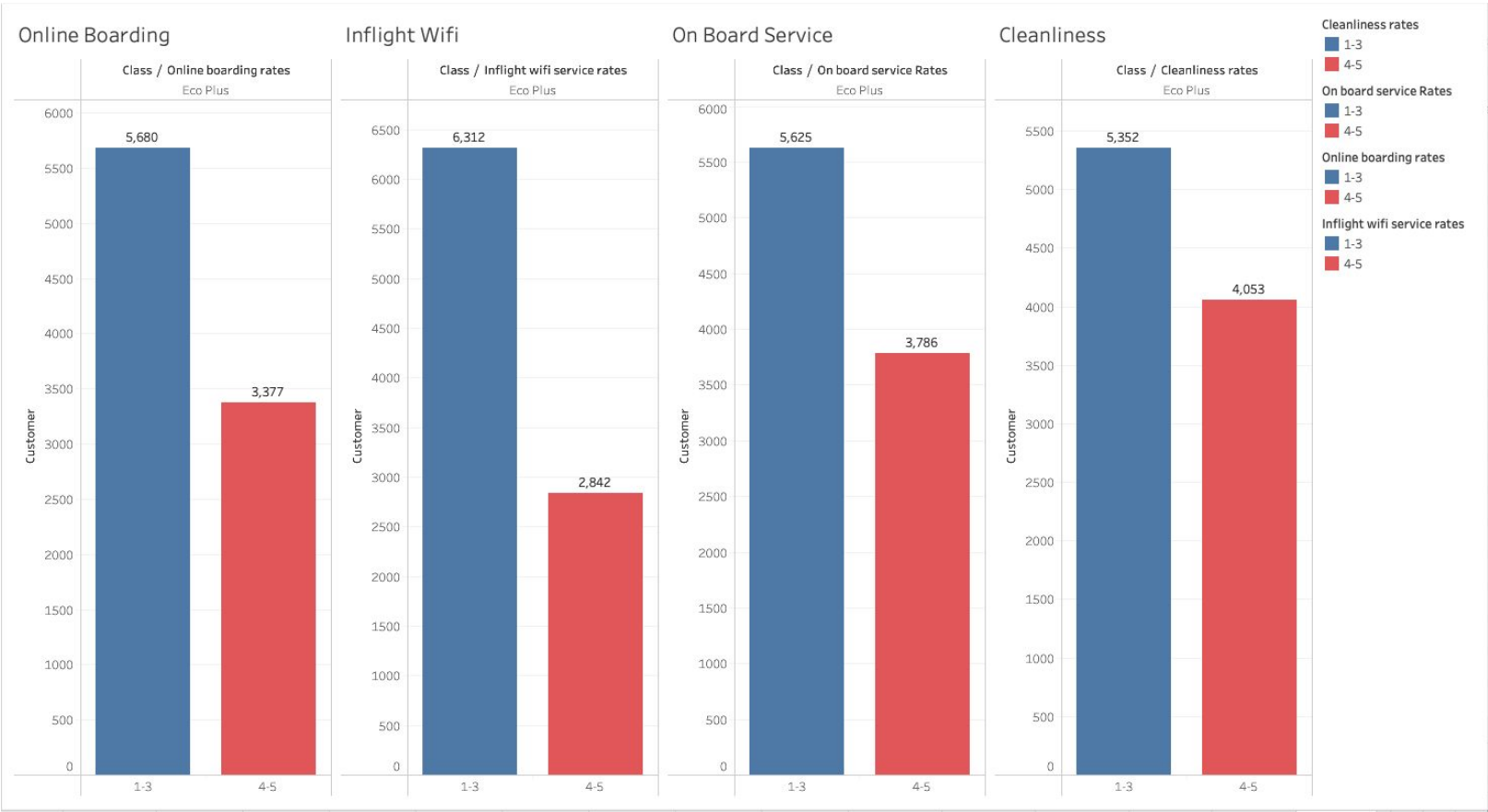


Inflight Wifi



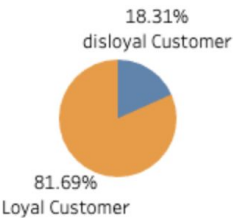
- Inflight wifi service rates
- 1-3
  - 4-5
- Online boarding rates
- 1-3
  - 4-5
- On board service Rates
- 1-3
  - 4-5
- Cleanliness rates
- 1-3
  - 4-5

# Customer Ratings for Economy Plus



*What are the customer types of passengers?*

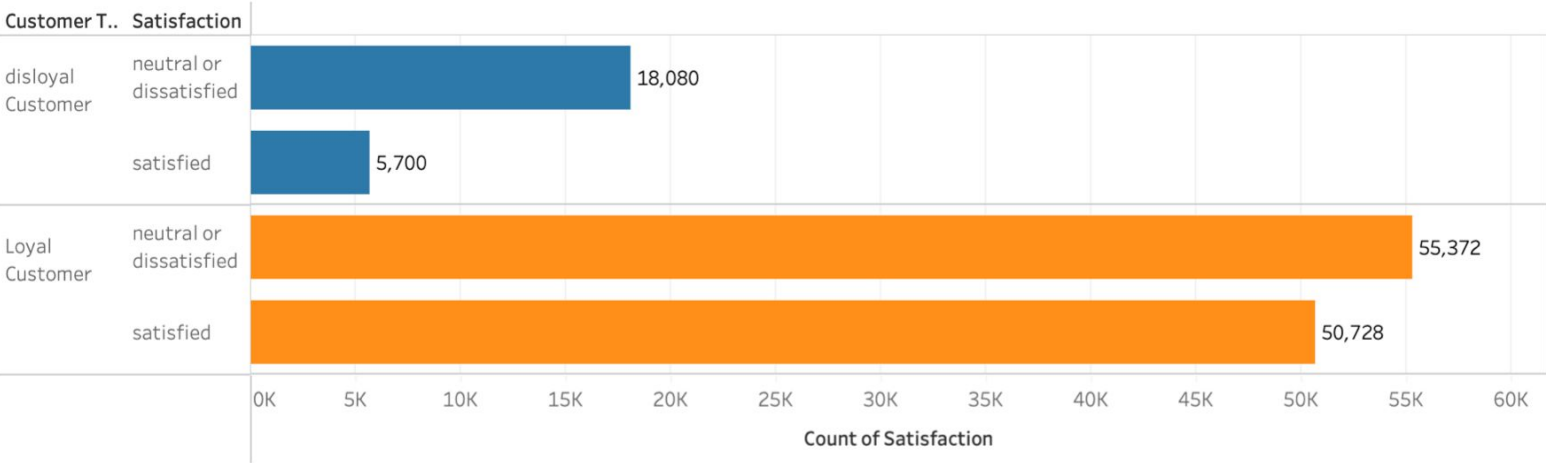
Customer Type  
Distribution



Customer Type

- disloyal Customer
- Loyal Customer

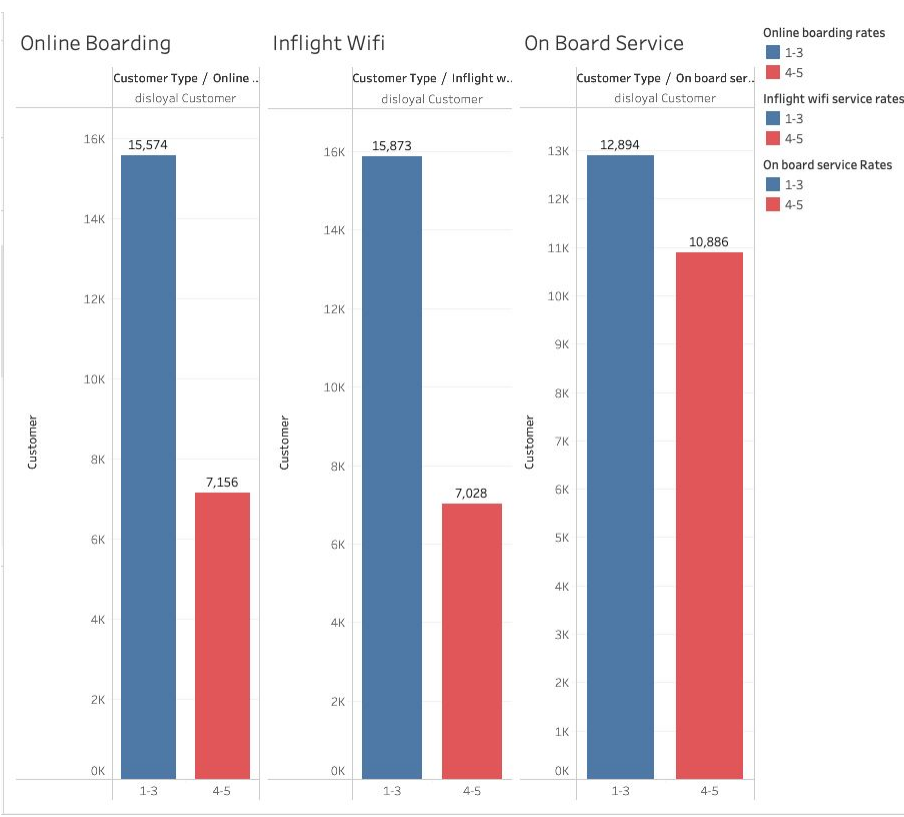
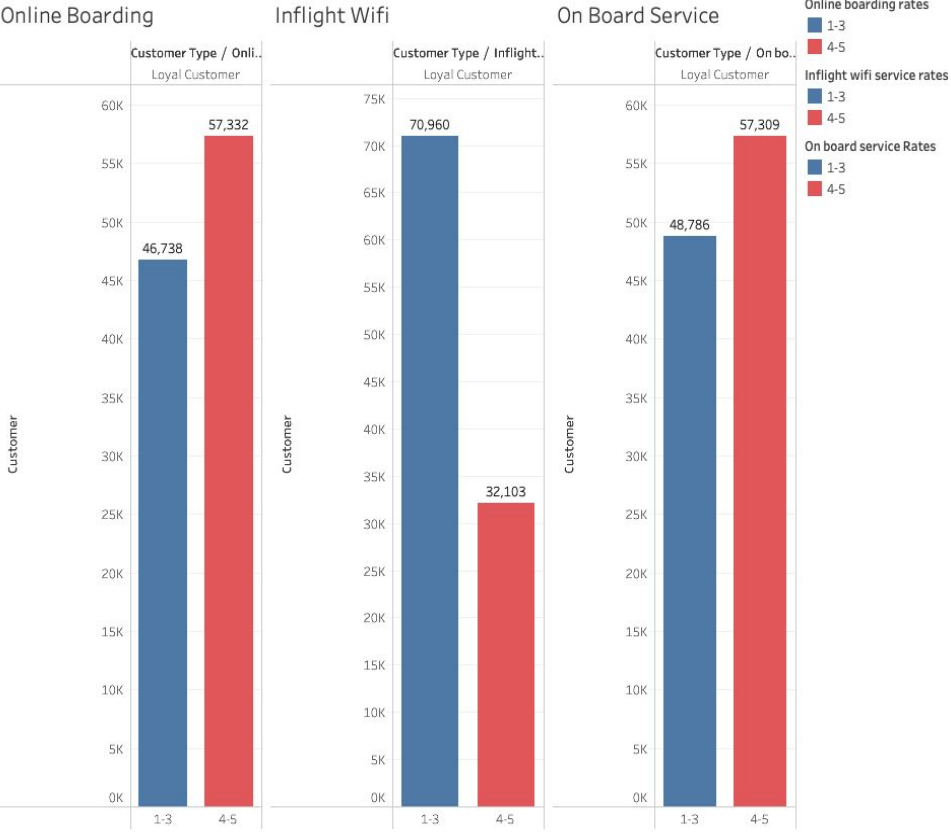
Customer Type Satisfaction



Customer Ratings for loyal customers

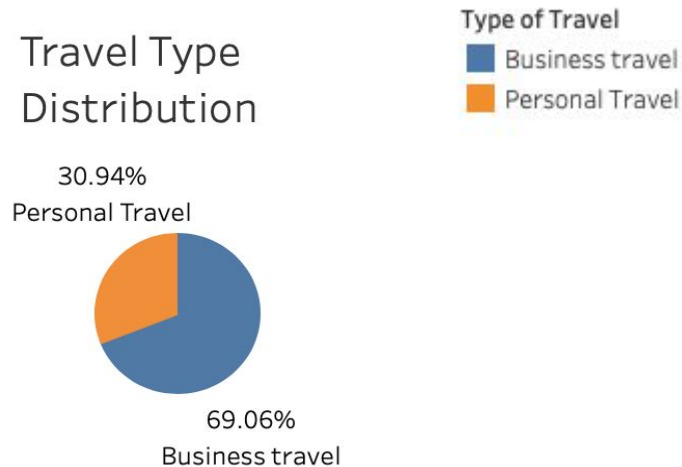
vs

Customer Ratings for disloyal customers

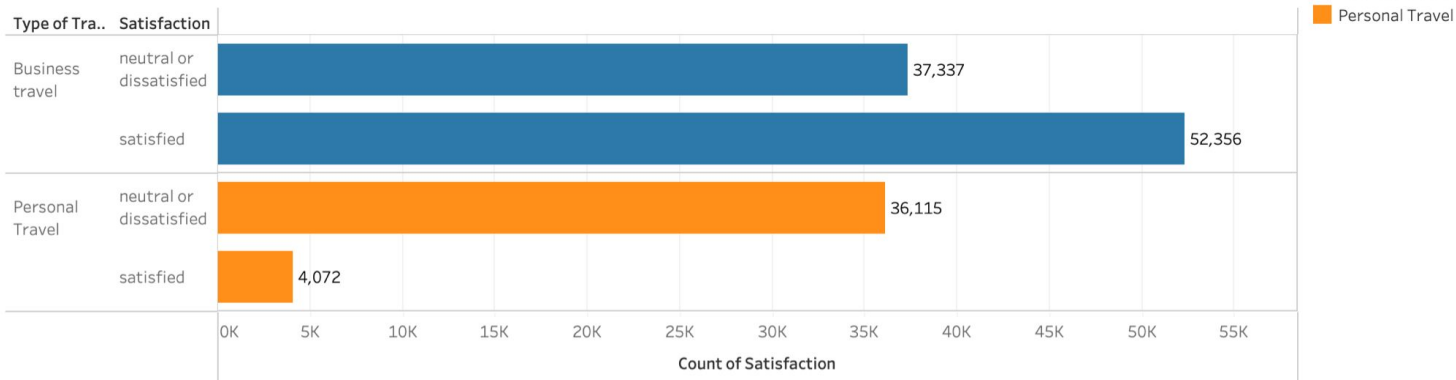


*How many people in each travel type?*

## Travel Type Distribution



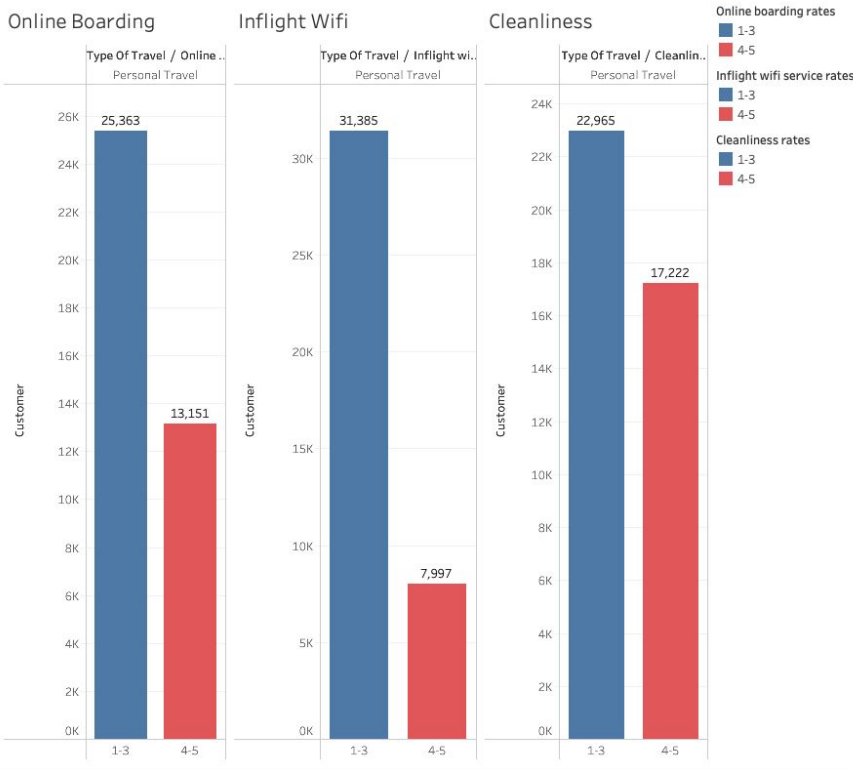
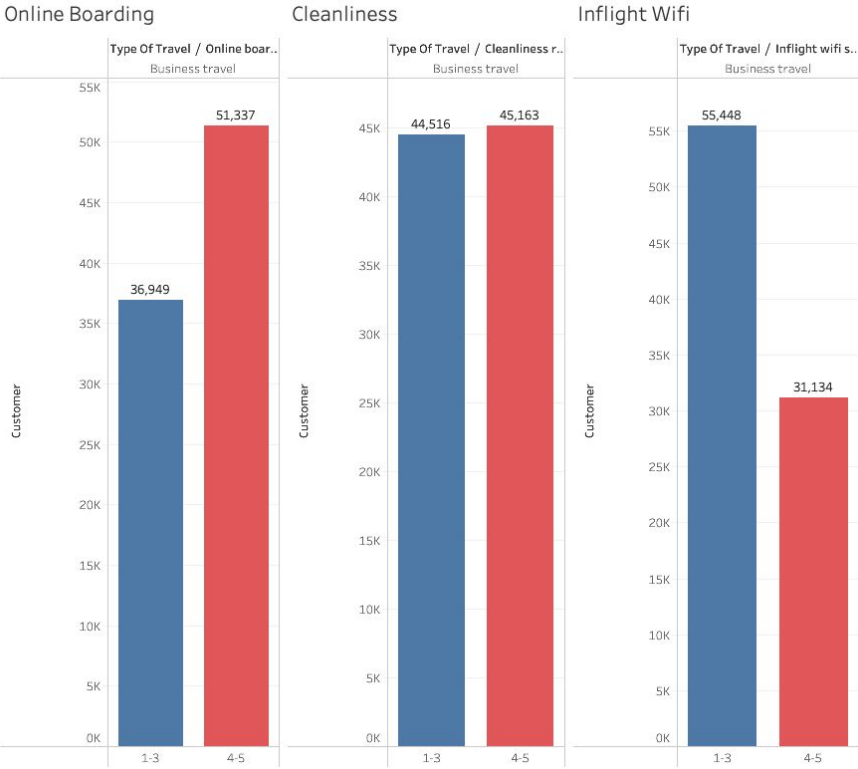
## Travel Type Satisfaction



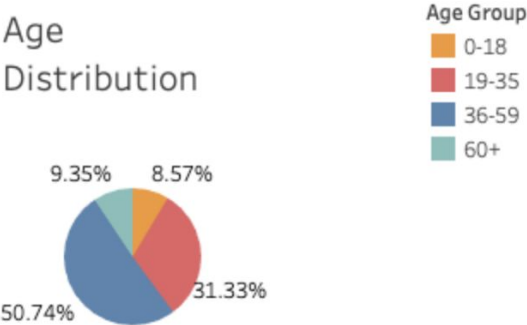
# Customer Ratings for Business Travel

vs

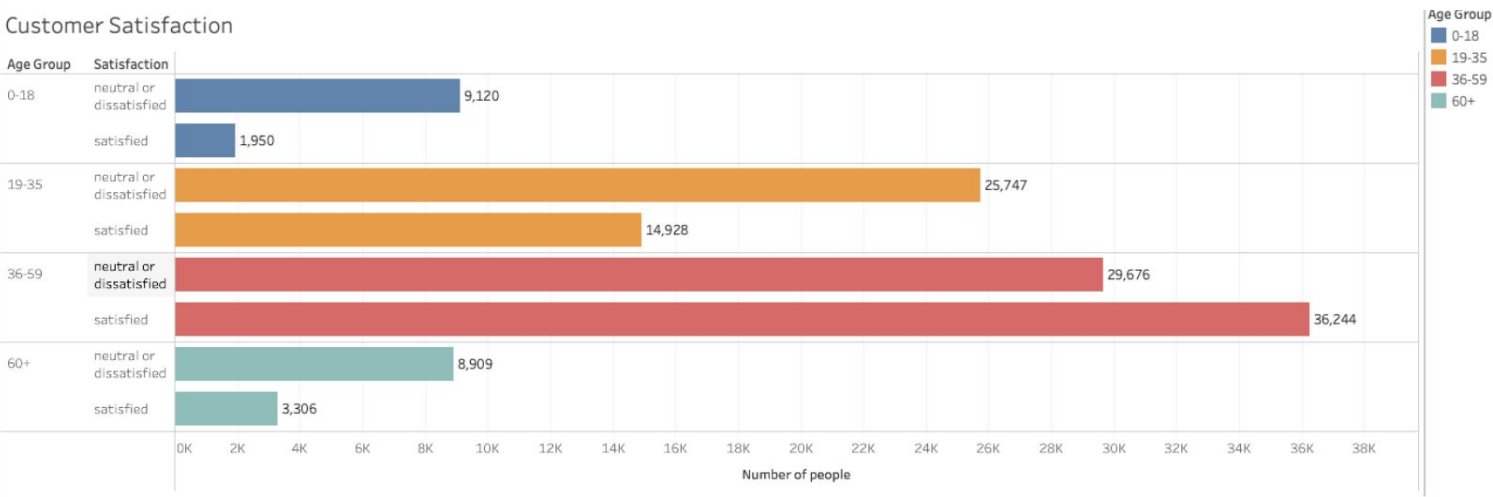
# Customer Ratings for Personal Travel



*What percentage of people are in each age group?*

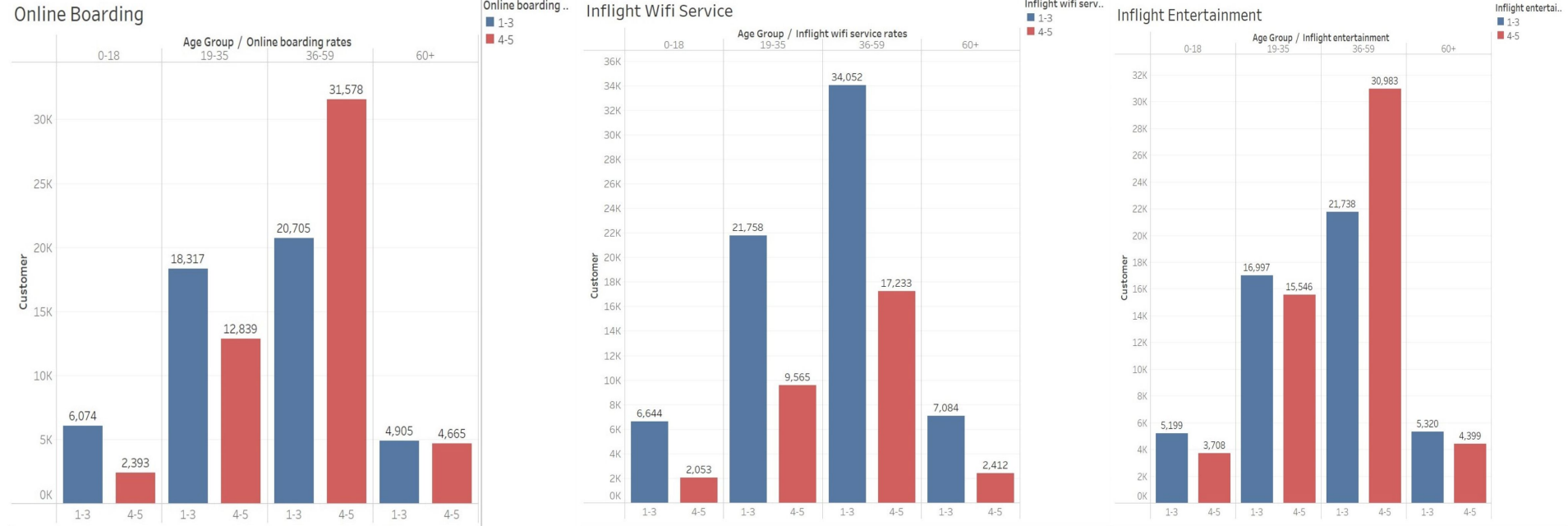


*How do different age groups rate each service?*



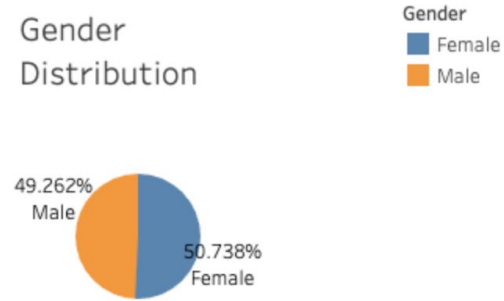


# Customer Ratings by age group



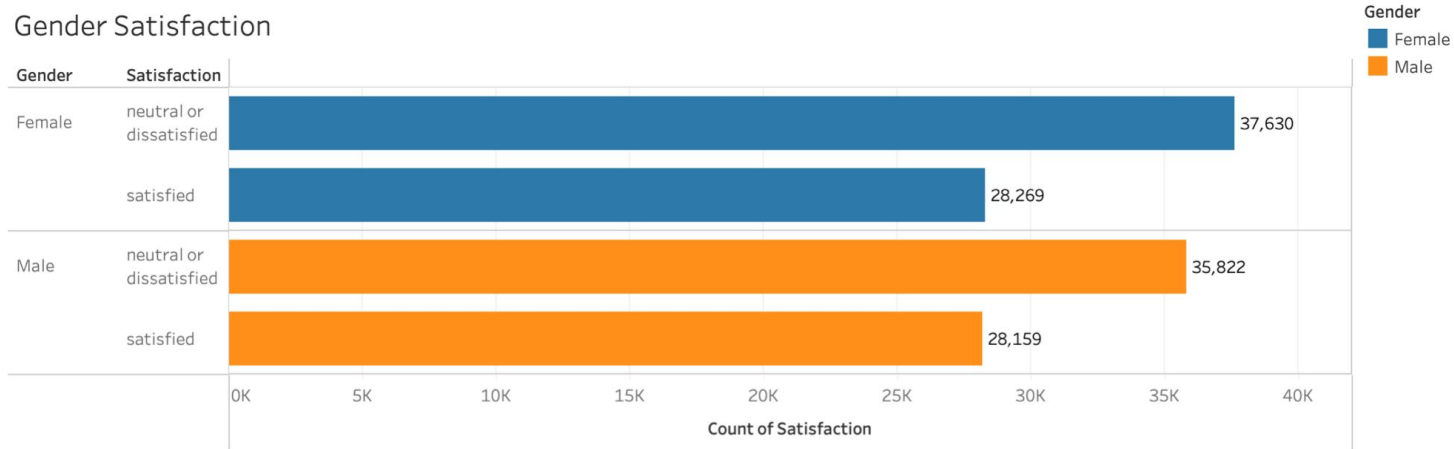
*What percentage of people are in each gender group?*

Gender  
Distribution



*Customer Ratings for **Male** vs **Female***

Gender Satisfaction



# *Model to help estimate and set goal*

## Business Questions:

1. How satisfied will customers be if Online Boarding increases to 5?

## Creating the model

```
%%bigquery --project=ba775-team5-b2
CREATE OR REPLACE MODEL Airline_satisfaction.satisfaction_model
OPTIONS
( model_type='LOGISTIC_REG',
  auto class weights=TRUE.
```

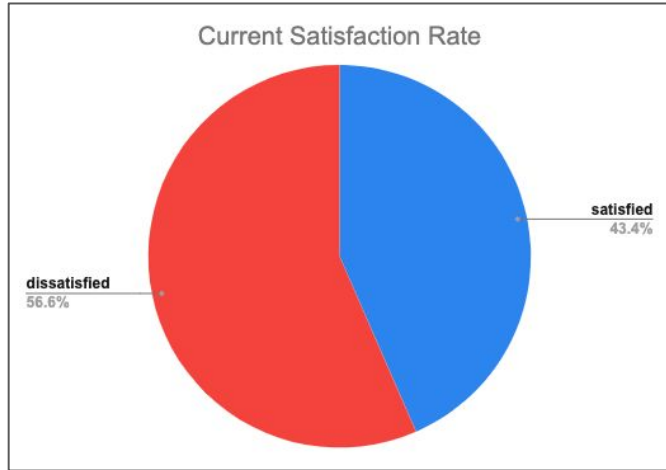
### Confusion matrix

This table shows how often the model classified each label correctly (in blue),

True label	Predicted label	
	1	0
1	89%	11%
0	22%	78%

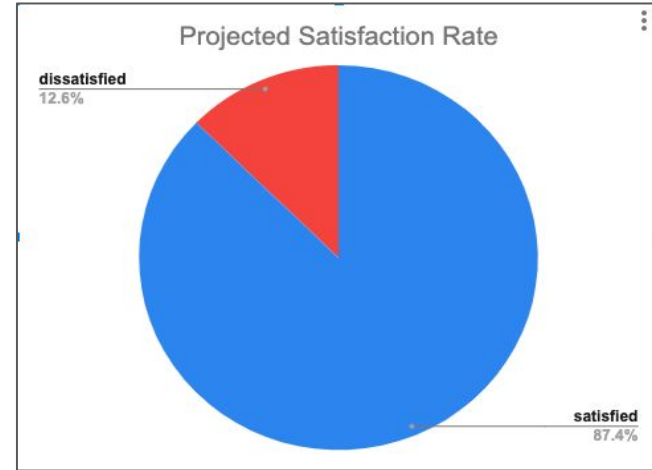
## *Model to help estimate and set goal*

Online boarding as 3.25  
Inflight wifi service as 2.73



satisfaction		customer
0	neutral or dissatisfied	73452
1	satisfied	56428

Online boarding and Inflight wifi service  
are to increase to 5



predicted_satisfaction		Customers
0	1	113464
1	0	16416

### *What do people travel for?*

- **Business**
- **Personal**

### *Who are they?*

- **Age ( 36-54)** are dissatisfied
- **#1 Business** and personal travelers

## ***Persona***

### *What do loyal and disloyal customers care about?*

- Online boarding (both)
- **Wifi is key across all ages and travel type**
- On Board Service (both)

### *Why are they dissatisfied ?*

- **wifi (both, but disloyal customer**
- **Entertainment (loyal)**
- **Online boarding**
- cleanliness (Loyal)
- leg\_room (Loyal)
- On Board Service (both)

## *Key Takeaways*

### TOP FACTORS AFFECTING SATISFACTION

#### **Online boarding**

Both loyal and disloyal customers prefer better and quicker boarding times at the gate

#### **Inflight Wifi Service**

Customers on #1 business and personal travel are deeply affected by excellent in flight wifi services

#### **Seat Comfort**

Legroom and comfort are vital for customers in both business and personal travel

#### **On board Service**

On board services including check-ins and delays and times affect customer satisfaction



***Thanks!***

Q&A Session Start



# RESOURCES

## Dataset

- Airline Passenger Satisfaction  
(<https://www.kaggle.com/teejmahal20/airline-passenger-satisfaction?select=train.csv>). -Data

## References link

- Correlation Heatmap:  
<https://medium.com/@szabo.bibor/how-to-create-a-seaborn-correlation-heatmap-in-python-834c0686b88e>

Kernel Density Estimation:

<https://medium.com/intel-student-ambassadors/kernel-density-estimation-with-python-using-sklearn-c50b3c337871>



## *What do travel for?*

- **Business**
- **Personal**

## *Who are they?*

- **Age ( 36-54)** are dissatisfied
- **#1 Business** and personal travelers

# **Persona**

## *What do loyal and disloyal customers care about?*

- Online boarding \*\*\* (both)
- wifi \*\*(both, but disloyal customer)
- On Board Service (both)

## *Why are they dissatisfied ?*

- Online boarding \*\*\* (both)
- wifi \*\*(both, but disloyal customer sees greater disparity )
- Inflight entertainment (Loyal)
- cleanliness (Loyal)
- leg\_room (Loyal)
- On Board Service (both)

## TAKEAWAYS

### Travel Type and Factors

1. Our passengers love to travel **Business class** and of those who are satisfied, a majority of them are **Business class travelers**
2. **Business Class { online boarding, legroom, seat comfort, inflight service, onboard service, baggage handling, cleanliness, Food + Drink }**
3. A majority of customers who are **dissatisfied** are **Economy travelers**
4. **Economy { inflight wifi services, onboarding rates, cleanliness }**

### Satisfied versus unsatisfied

- **Loyal customers are either satisfied or dissatisfied**
- **Satisfied { }**
- **Dissatisfied {online boarding/service ,comfort (leg room, entertainment, cleanliness)}**