



What factors affect airline customer satisfaction?

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Project Proposal



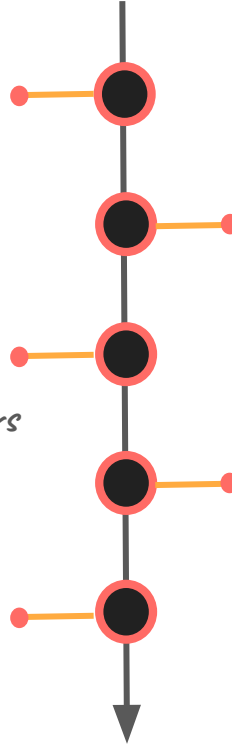
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Deep Dive in critical factors



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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

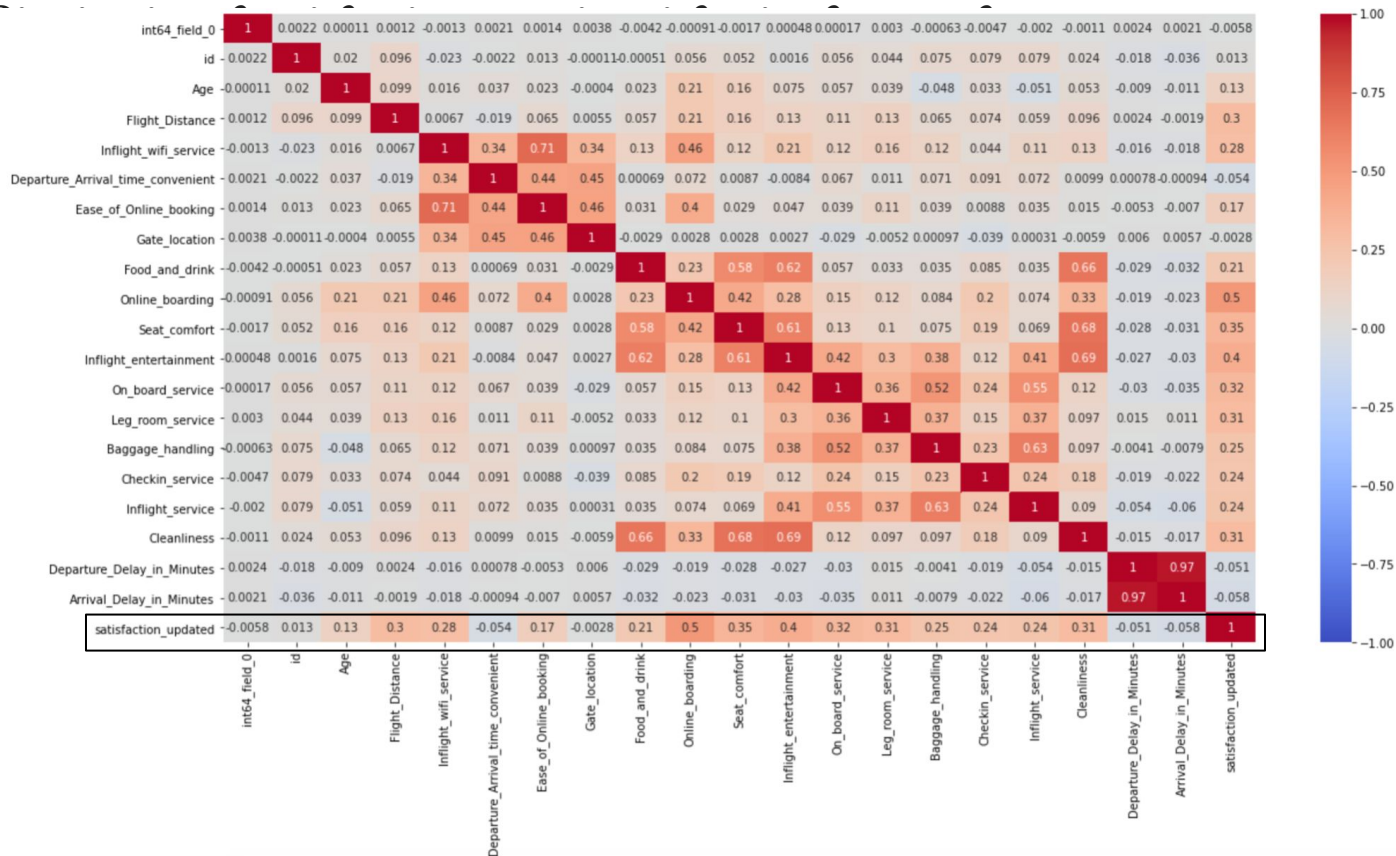


Inflight service

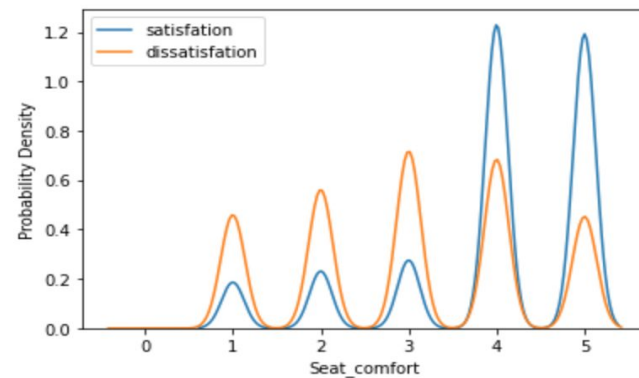
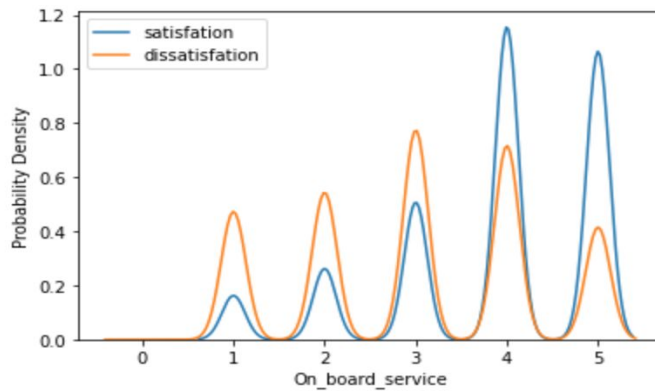
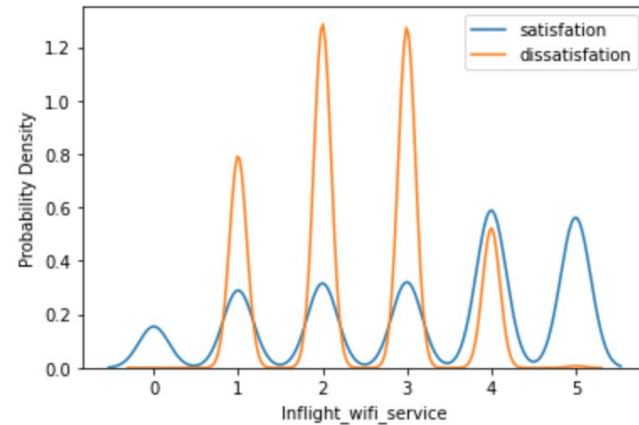
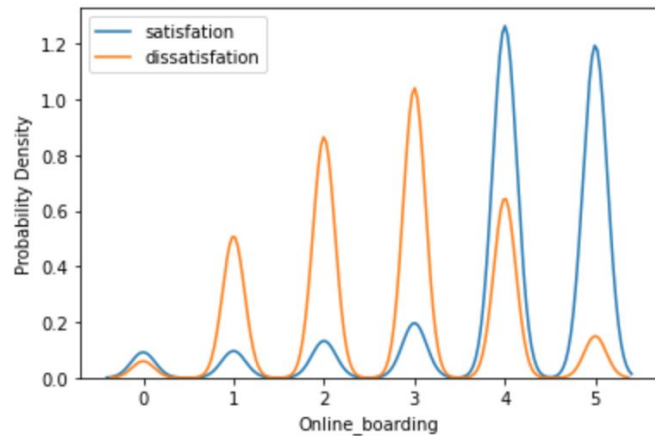


Cleanliness

Correlation Heatmap

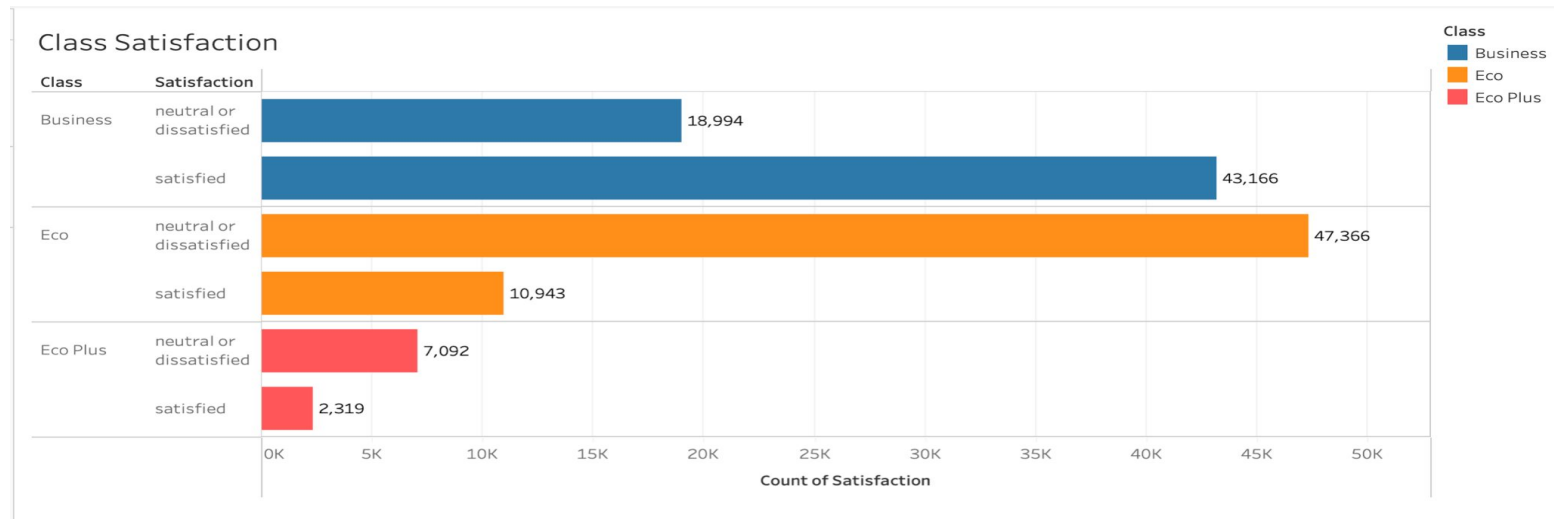
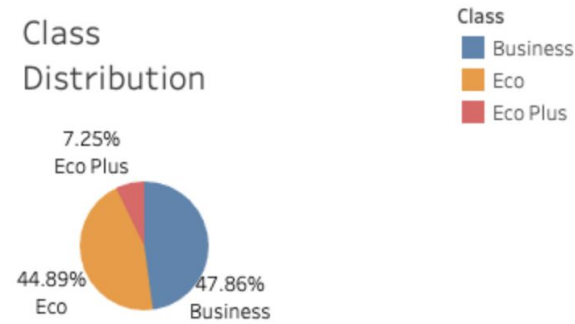


Key Factors

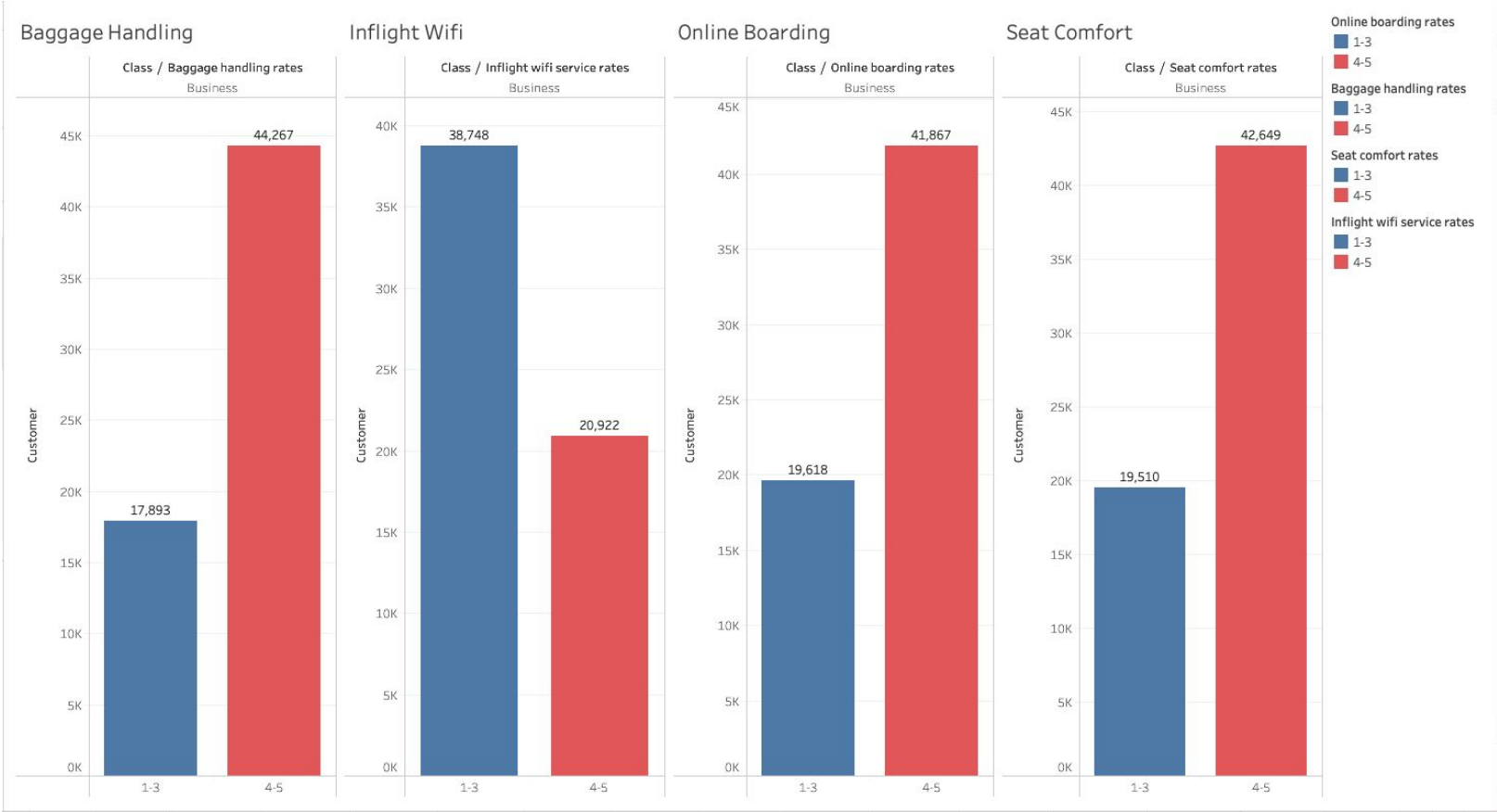


which service the airline does the best?

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

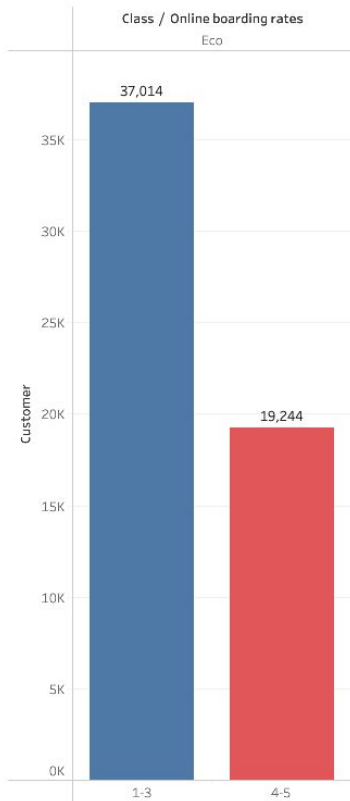


Customer Ratings for Business Class

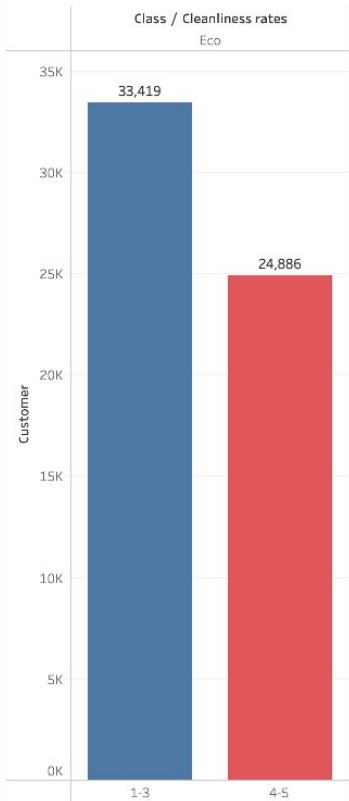


Customer Ratings for Economy Class

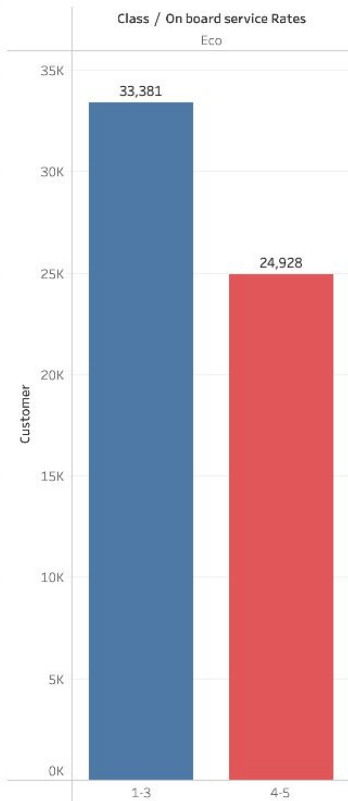
Online Boarding



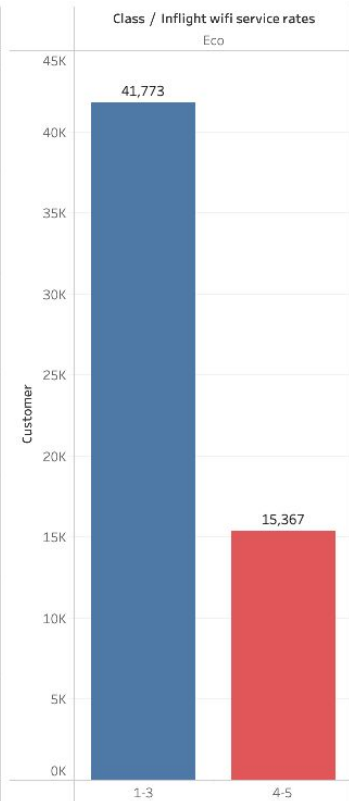
Cleanliness



On Board Service

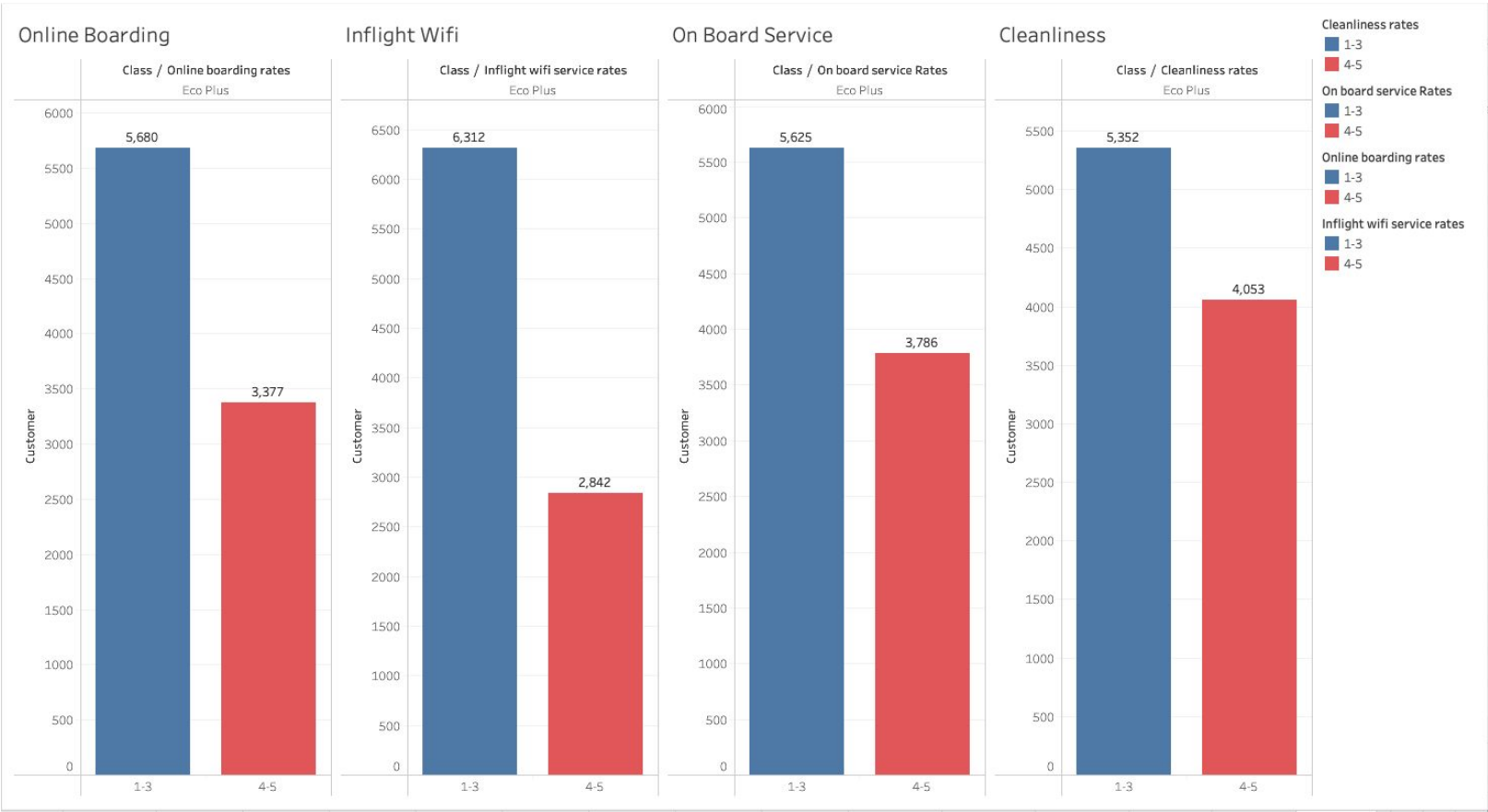


Inflight Wifi



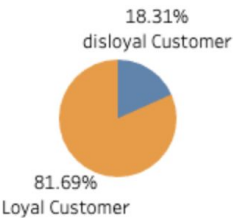
- Inflight wifi service rates
- 1-3
 - 4-5
- Online boarding rates
- 1-3
 - 4-5
- On board service Rates
- 1-3
 - 4-5
- Cleanliness rates
- 1-3
 - 4-5

Customer Ratings for Economy Plus



What are the customer types of passengers?

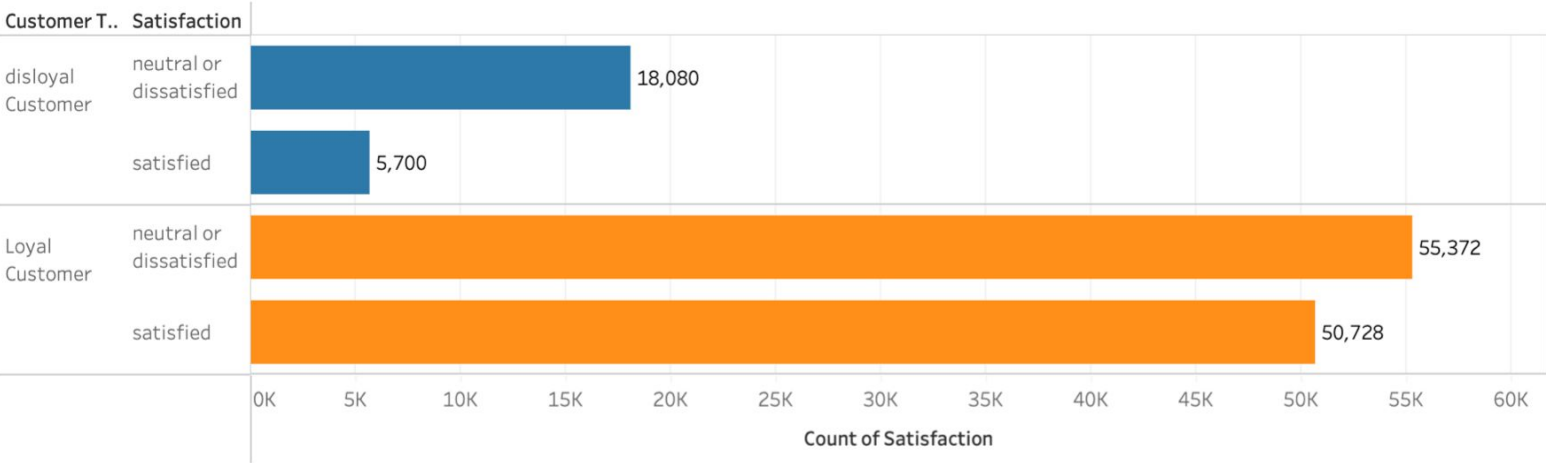
Customer Type
Distribution



Customer Type

- disloyal Customer
- Loyal Customer

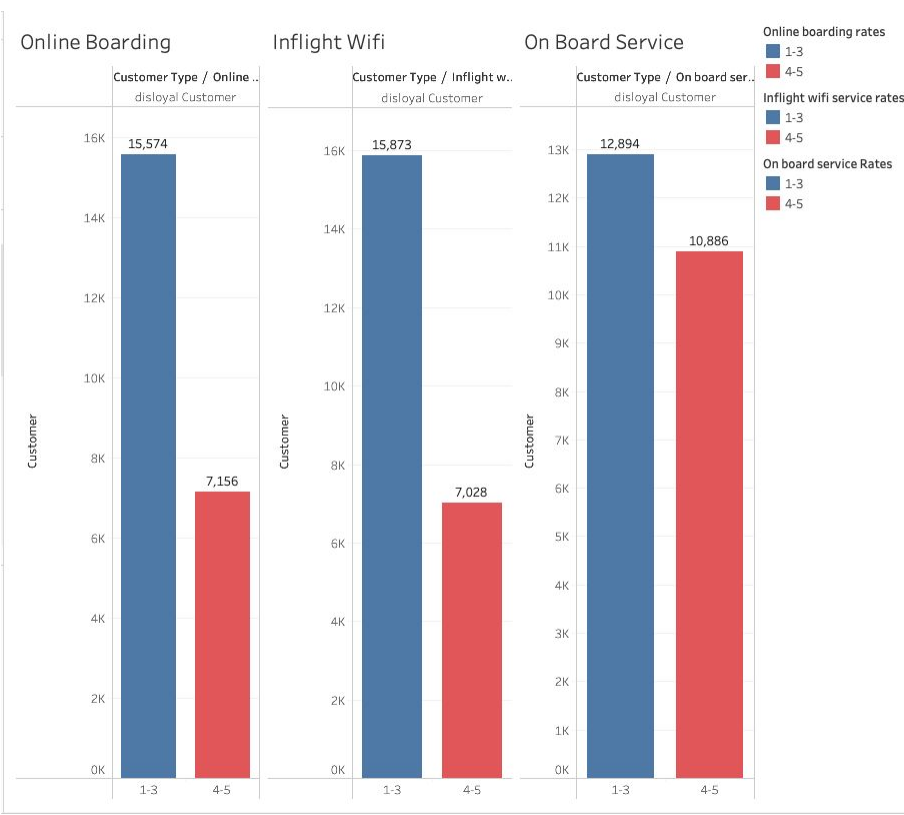
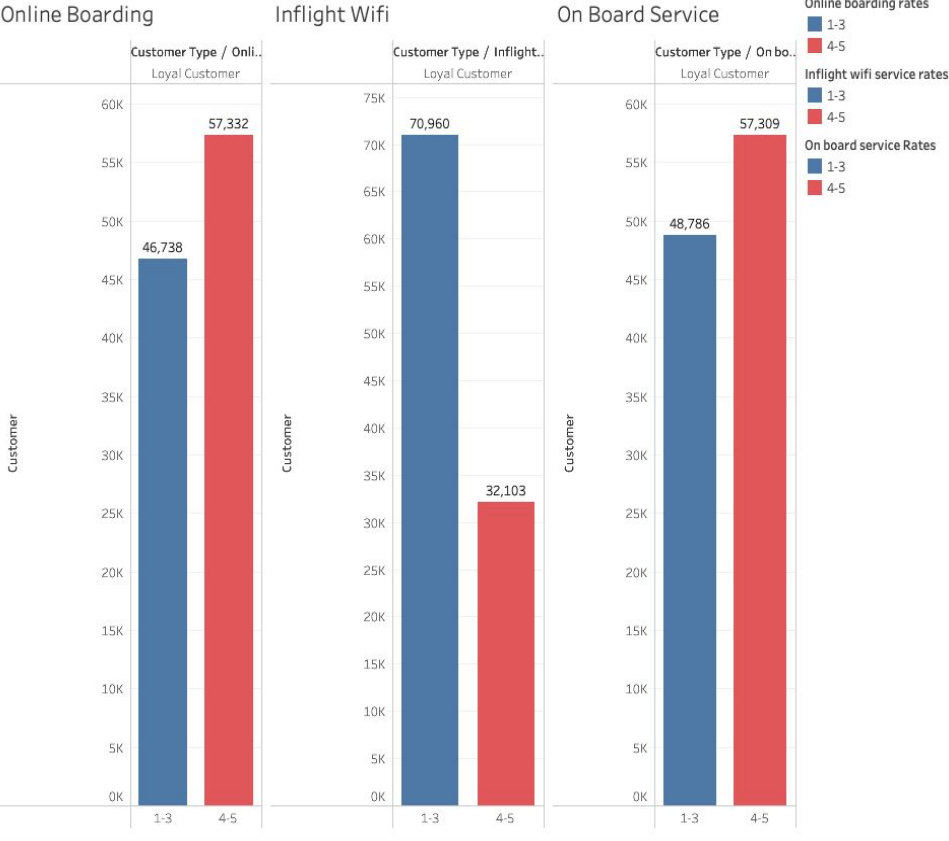
Customer Type Satisfaction



Customer Ratings for loyal customers

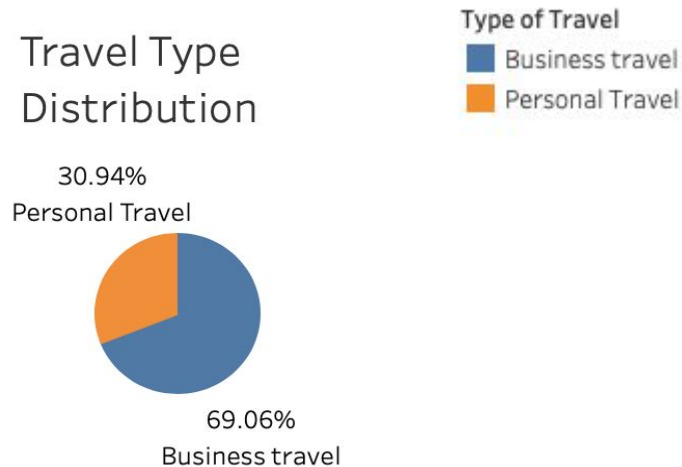
vs

Customer Ratings for disloyal customers

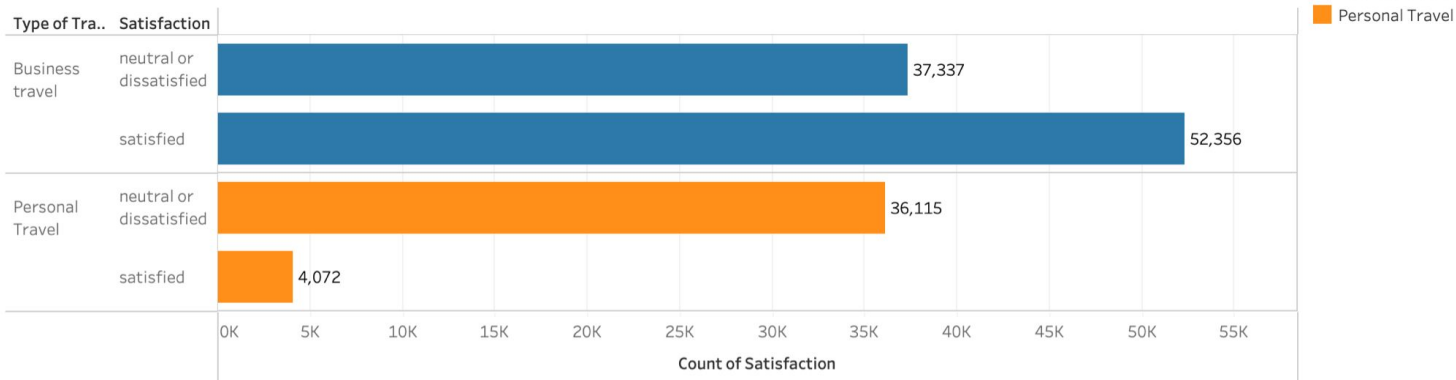


How many people in each travel type?

Travel Type Distribution



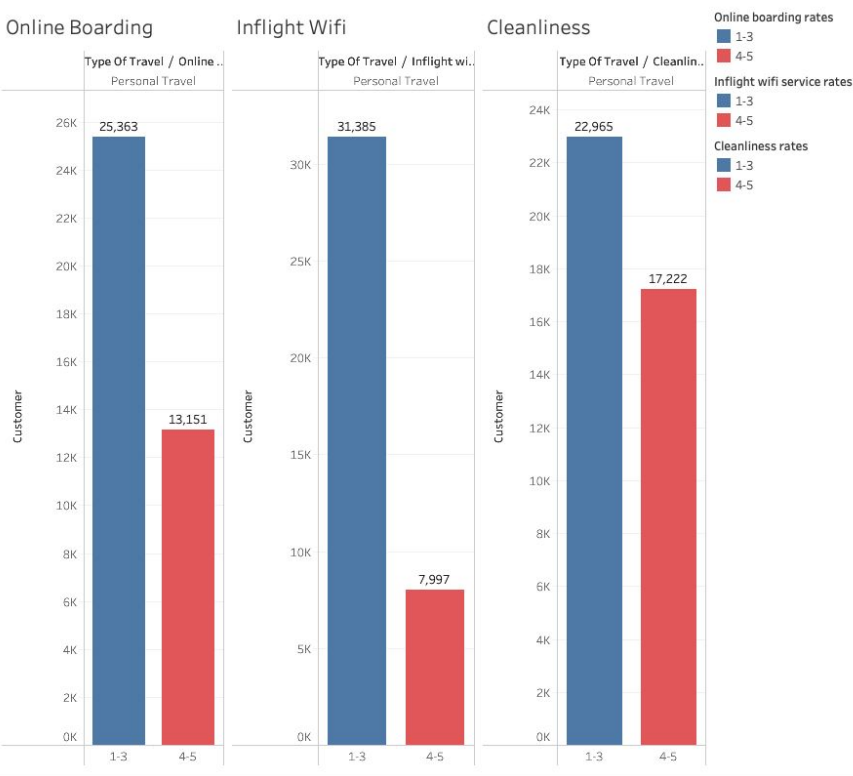
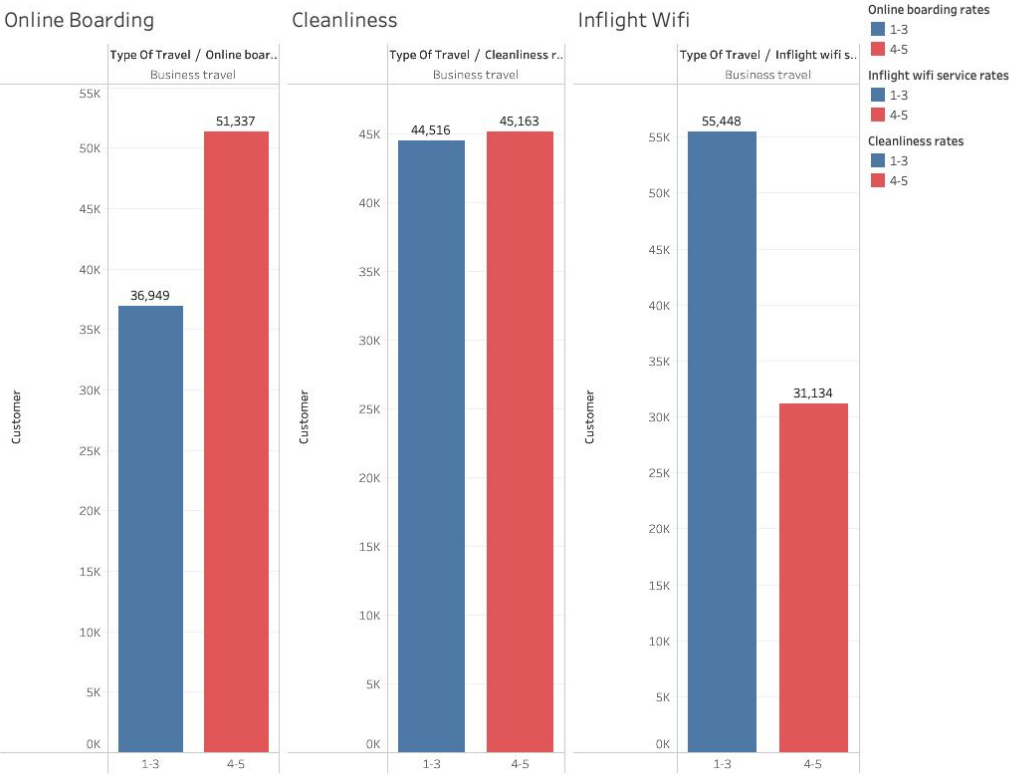
Travel Type Satisfaction



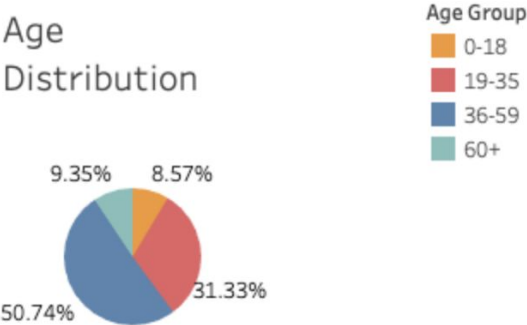
Customer Ratings for Business Travel

vs

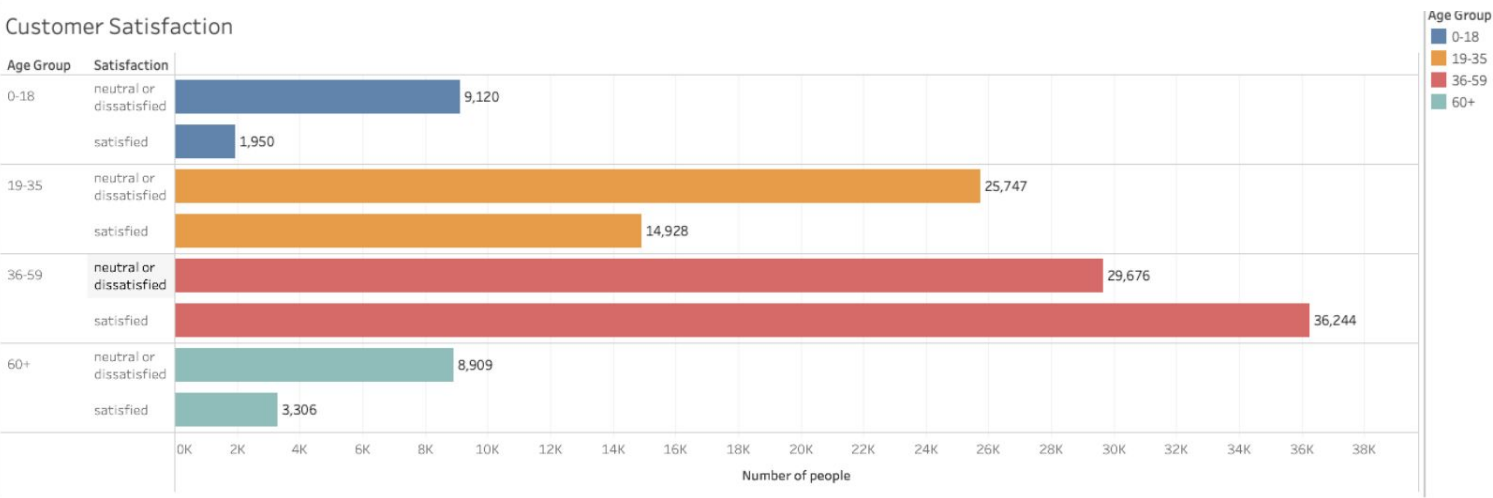
Customer Ratings for Personal Travel



What percentage of people are in each age group?

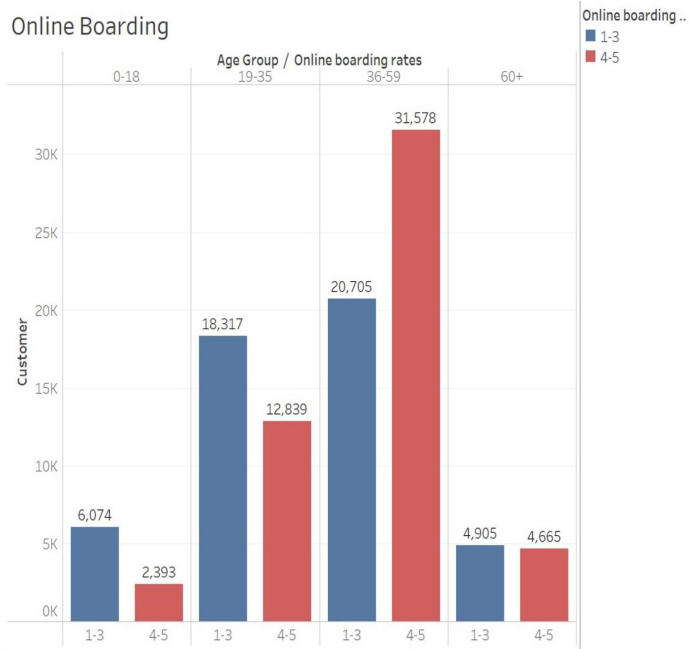


How do different age groups rate each service?

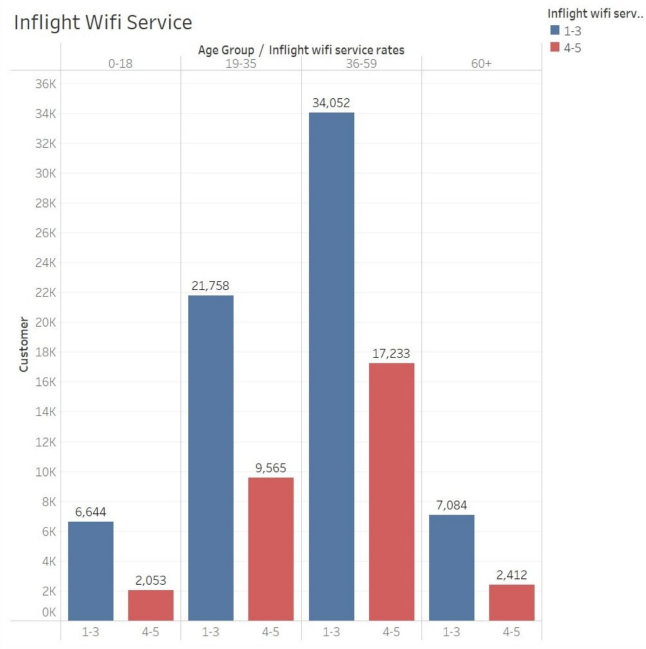


Customer Ratings by age group

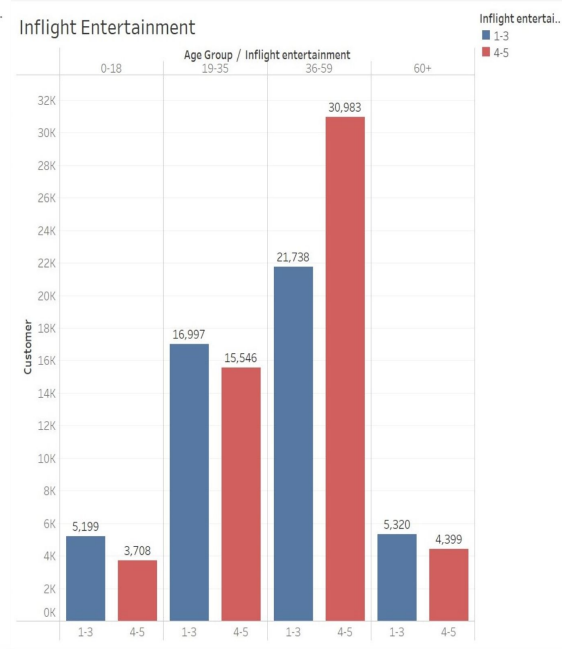
Online Boarding



Inflight Wifi Service

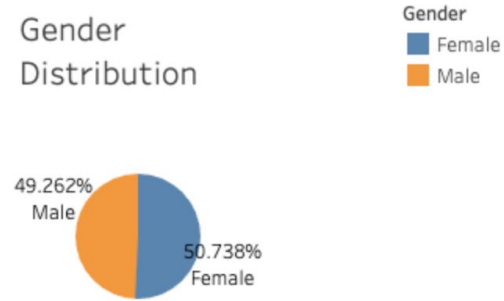


Inflight Entertainment



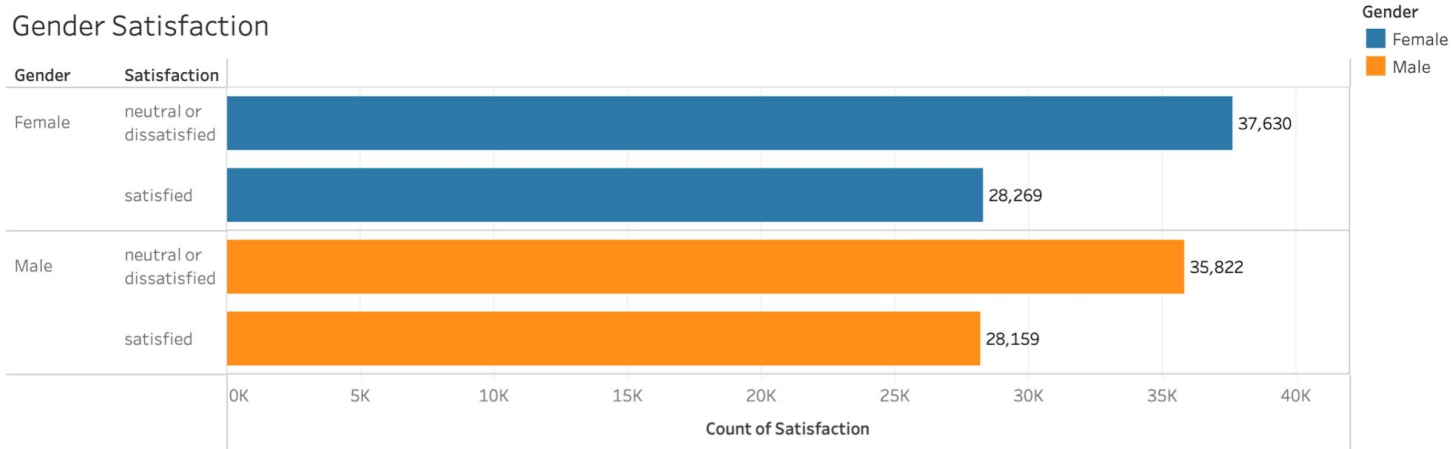
What percentage of people are in each gender group?

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.
```

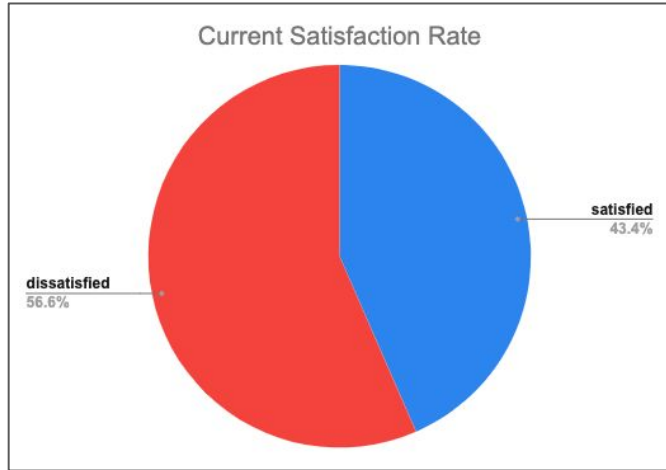
Confusion matrix

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%

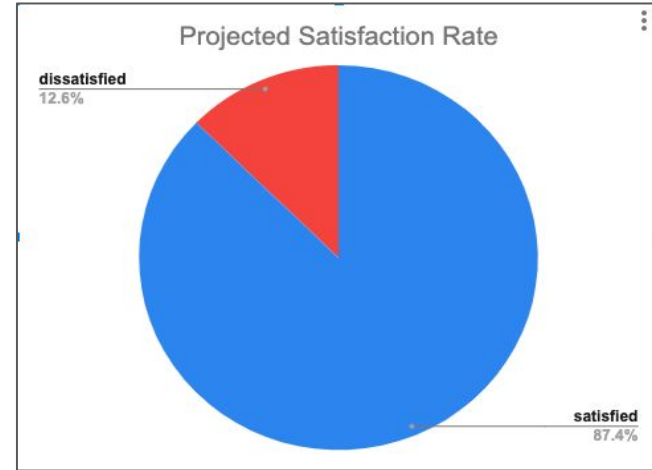
Model to help estimate and set goal

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)}**