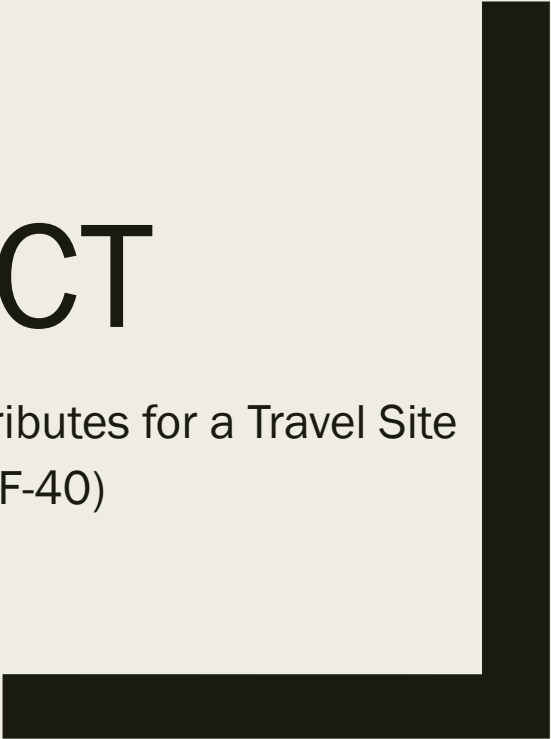




FINAL PROJECT

Predicting Conversion based on Search Attributes for a Travel Site
-- Shivendra Kishor (DAT-SF-40)



Hypothesis:

- Predicting a conversion of a search using search parameters available on the travel website

OR

- How likely a customer is going to book an hotel based on his search parameters from his/her search session attributes

The screenshot displays the Expedia website interface for a hotel search in Singapore. The search parameters at the top are: Destination: Singapore (all), Singapore; Dates: Sat, Jan 27 - Mon, Jan 29; Rooms: 1. A yellow banner offers a 10% discount to a user named Shivendra. The search results are for 'Singapore (all): 521 properties'. The left sidebar includes a map, a search bar, and filters for Property Class (3 to 5 stars), Price Per Night (\$75 to \$299), and Vacation Rental Bedrooms (1 to 4). The main content area shows three hotel listings: Four Seasons Hotel Singapore (4.7/5 rating, \$241-\$230/night), 30 Bencoolen (4.5/5 rating, \$163-\$107/night), and YOTEL Singapore Orchard Road (4.2/5 rating, \$122-\$100/night). Each listing includes a photo, star rating, location, and price details.

DESTINATION: Singapore (all), Singapore | DATES: Sat, Jan 27 - Mon, Jan 29 | ROOMS: 1 | Change search | Recent searches

Welcome, Shivendra. You'll now get an extra 10% or more off select hotels. Sort by hotels with member prices.

Singapore (all): 521 properties | Questions? 1-800-552-0114

Sort By: Distance from Downtown | Price | Guest Rating | Vacation Rentals | Recommended | More

Expedia+ points applied: You have 1,482 points

See how we pick our recommended properties

Search by property name: [Search bar] Go

Filter properties by

Property Class

- ☐ 5 Stars
- ☐ 4 Stars
- ☐ 3 Stars

Price Per Night

- ☐ Less than \$75
- ☐ \$75 to \$124
- ☐ \$125 to \$199
- ☐ \$200 to \$299

Vacation Rental Bedrooms

- ☐ Studio
- ☐ 1 Bedroom
- ☐ 2 Bedrooms
- ☐ 3 Bedrooms
- ☐ 4+ Bedrooms

Four Seasons Hotel Singapore

Orchard Road

20% Savings on Best Room Rate

Luxurious accommodation nestled in the tree-lined enclave of Orchard Boulevard. Book at least 3 days in advance to enjoy 20% off.

1-866-264-5744 • Expedia Rate

15 people booked this property in the last 48 hours

30 Bencoolen

City Hall

1-866-267-9053 • Expedia Rate

31 people booked this property in the last 48 hours

YOTEL Singapore Orchard Road

Orchard Road

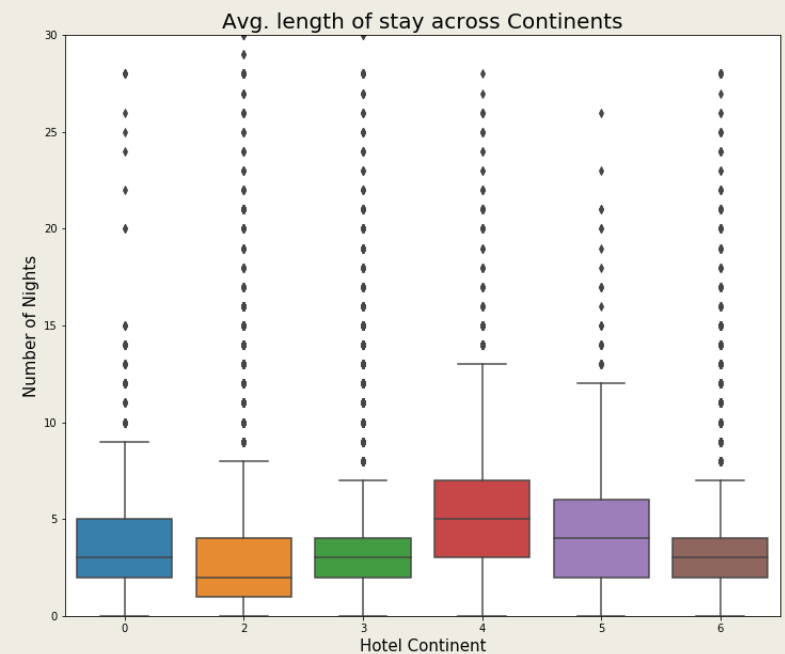
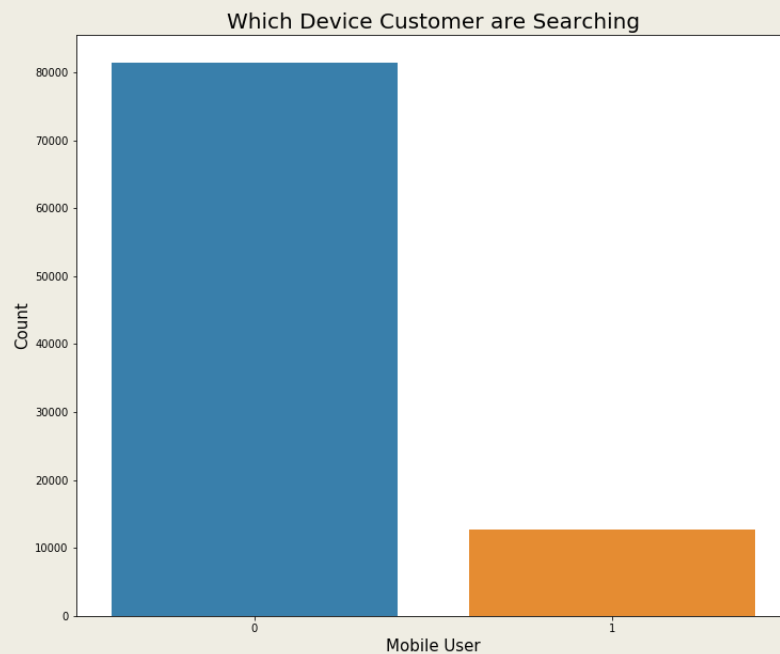
35% booked! Singapore is a popular location on your dates.

Data exploration: What Type of data we have

Column name	Description	Data type
date_time	Timestamp	string
site_name	ID of the Expedia point of sale (i.e. Expedia.com, Expedia.co.uk, Expedia.co.jp, ...)	int
posa_continent	ID of continent associated with site_name	int
user_location_country	The ID of the country the customer is located	int
user_location_region	The ID of the region the customer is located	int
user_location_city	The ID of the city the customer is located	int
orig_destination_distance	Physical distance between a hotel and a customer at the time of search. A null means the distance could not be calculated	double
user_id	ID of user	int
is_mobile	1 when a user connected from a mobile device, 0 otherwise	tinyint
is_package	1 if the click/booking was generated as a part of a package (i.e. combined with a flight), 0 otherwise	int
channel	ID of a marketing channel	int
srch_ci	Checkin date	string
srch_co	Checkout date	string
srch_adults_cnt	The number of adults specified in the hotel room	int
srch_children_cnt	The number of (extra occupancy) children specified in the hotel room	int
srch_rm_cnt	The number of hotel rooms specified in the search	int
srch_destination_id	ID of the destination where the hotel search was performed	int
srch_destination_type_id	Type of destination	int
hotel_continent	Hotel continent	int
hotel_country	Hotel country	int
hotel_market	Hotel market	int
is_booking	1 if a booking, 0 if a click	tinyint
cnt	Numer of similar events in the context of the same user session	bigint
hotel_cluster	ID of a hotel cluster	int

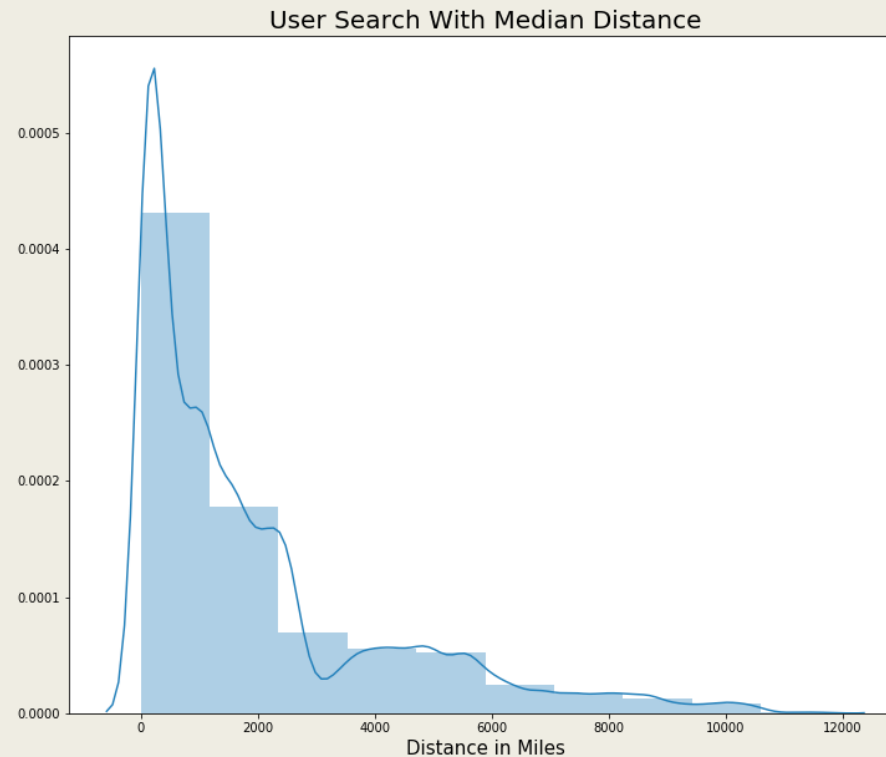
Data exploration: Characteristics of a dataset

- Users are searching more on Desktop on Expedia site compare to Mobile
- Average length of stay is higher for Continent 4



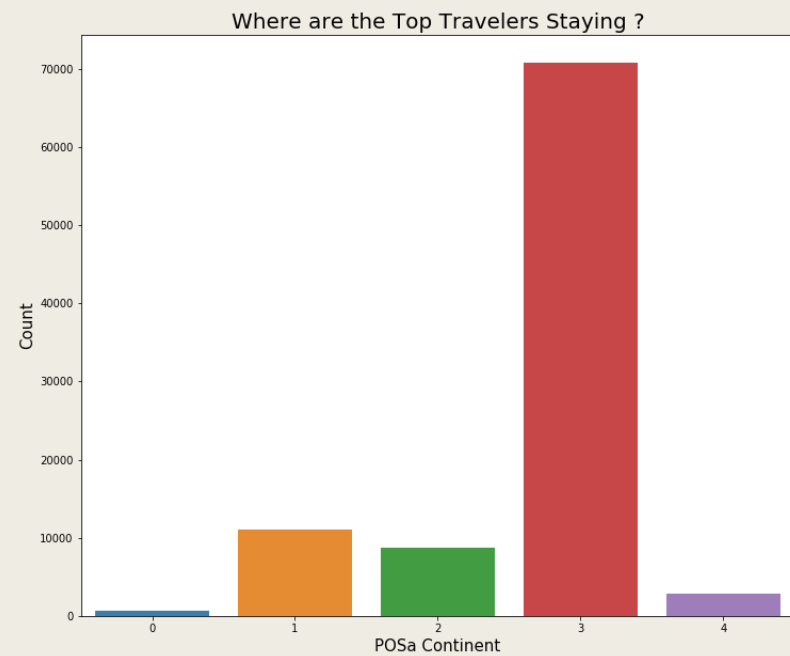
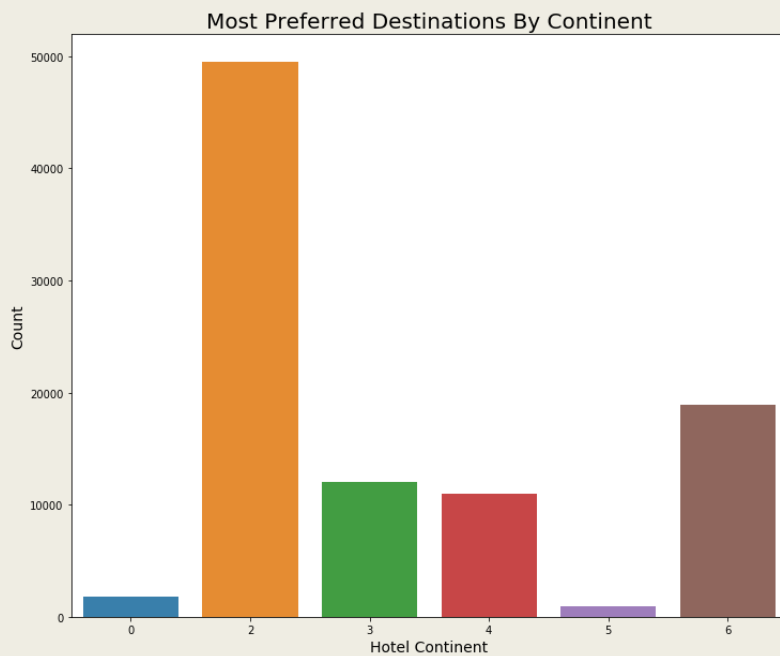
Data exploration: Characteristics of a dataset

- Most of the users made a search with 2000 miles of their search location



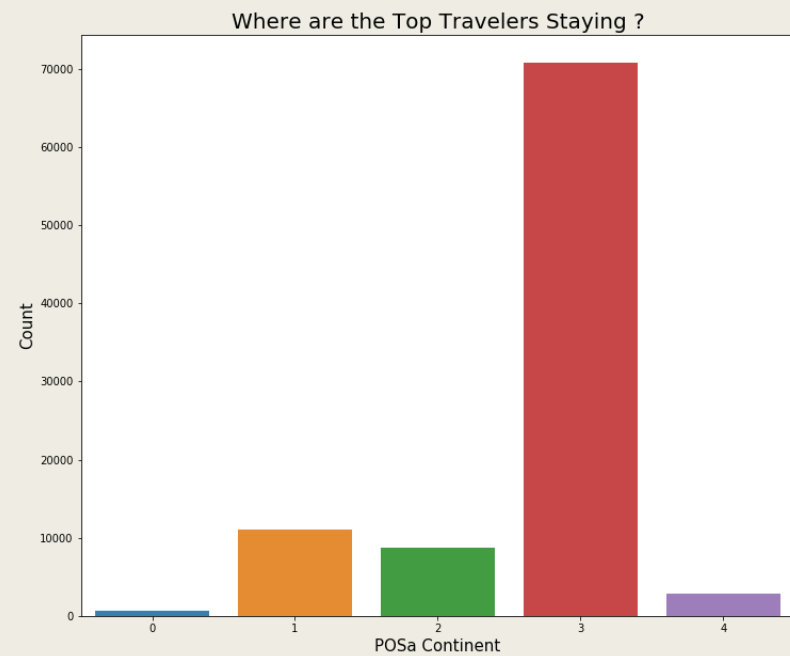
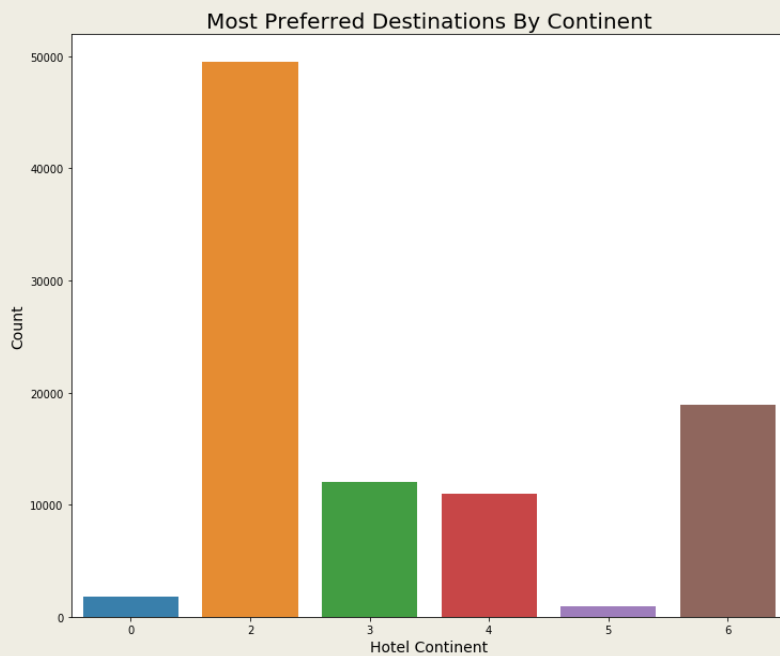
Data exploration: Characteristics of a dataset

- Most preferred destinations for Customers are from Continent 2
- Point of sale is High for Expedia Site from Continent 3



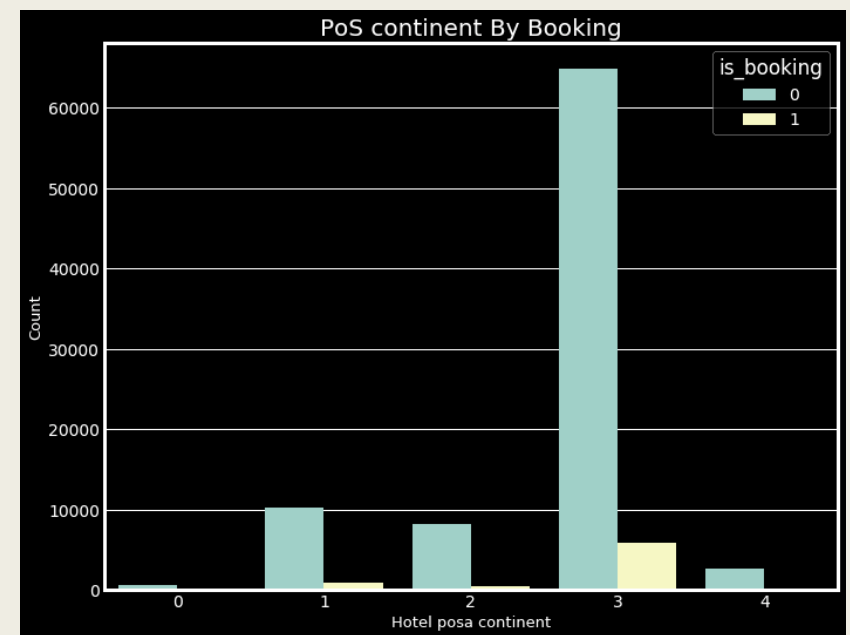
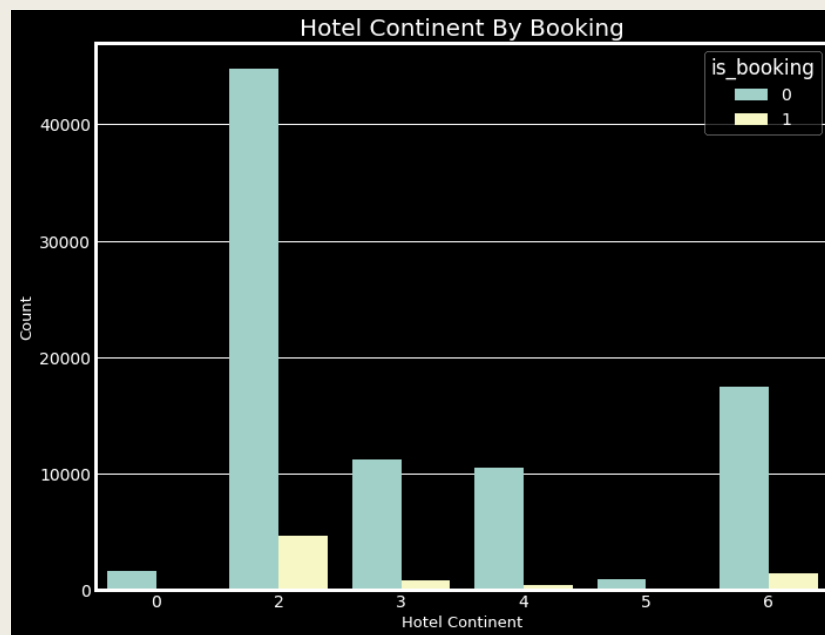
Data exploration: Characteristics of a dataset

- Most preferred destinations for Customers are from Continent 2
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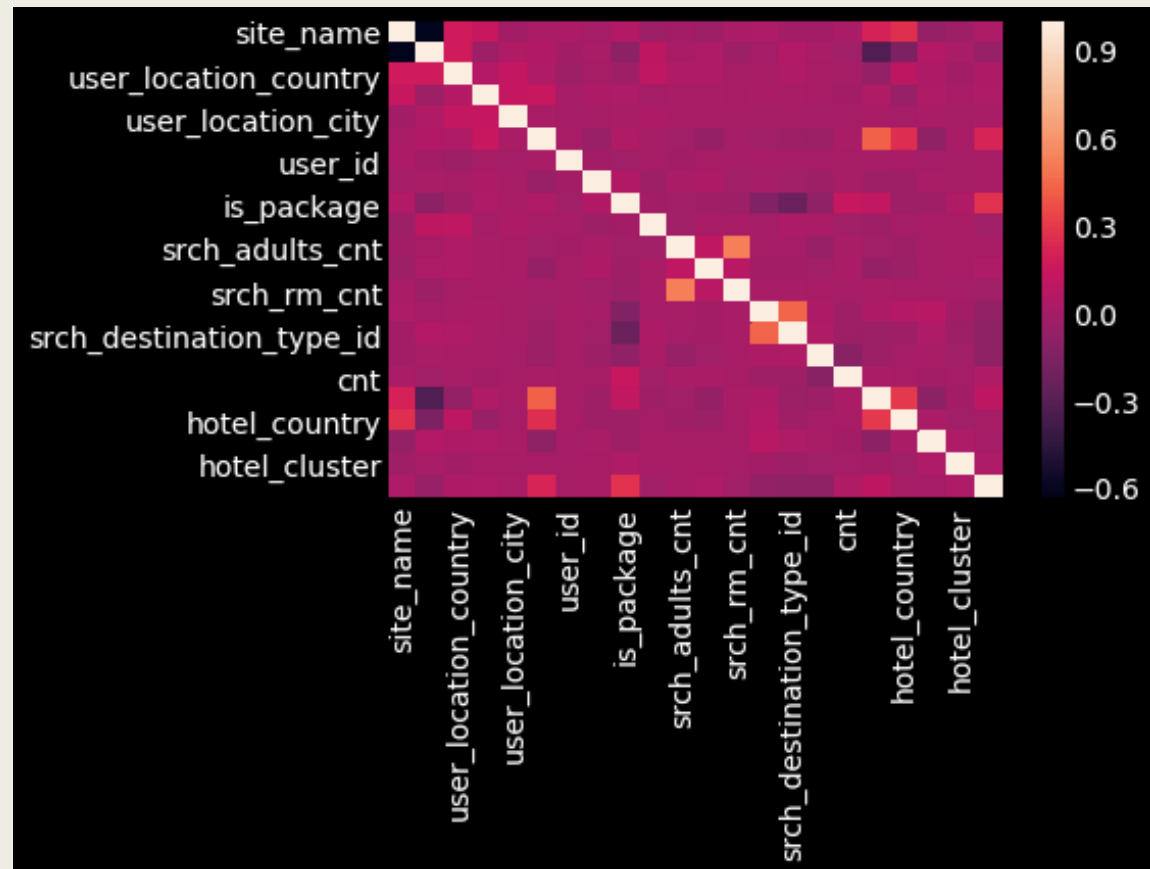
Data exploration: Characteristics of a dataset

- Maximum Booking is happening Continent 2 and 6
- PoS Continent 3 has High booking event



Data exploration: Characteristics of a dataset

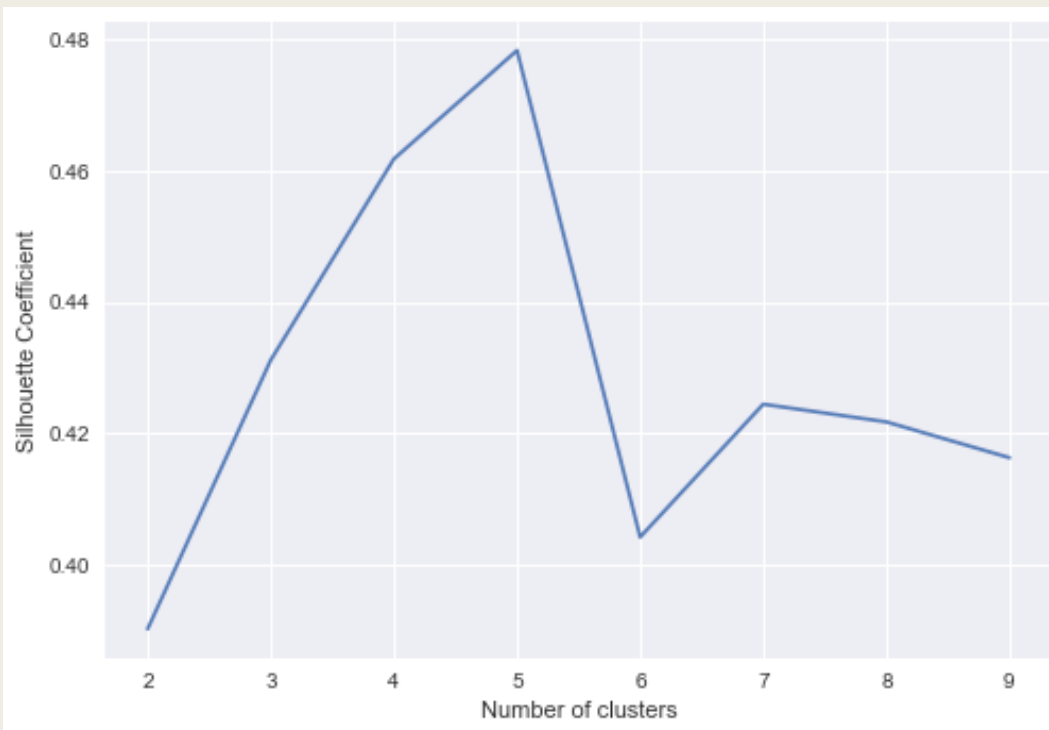
- Correlation :



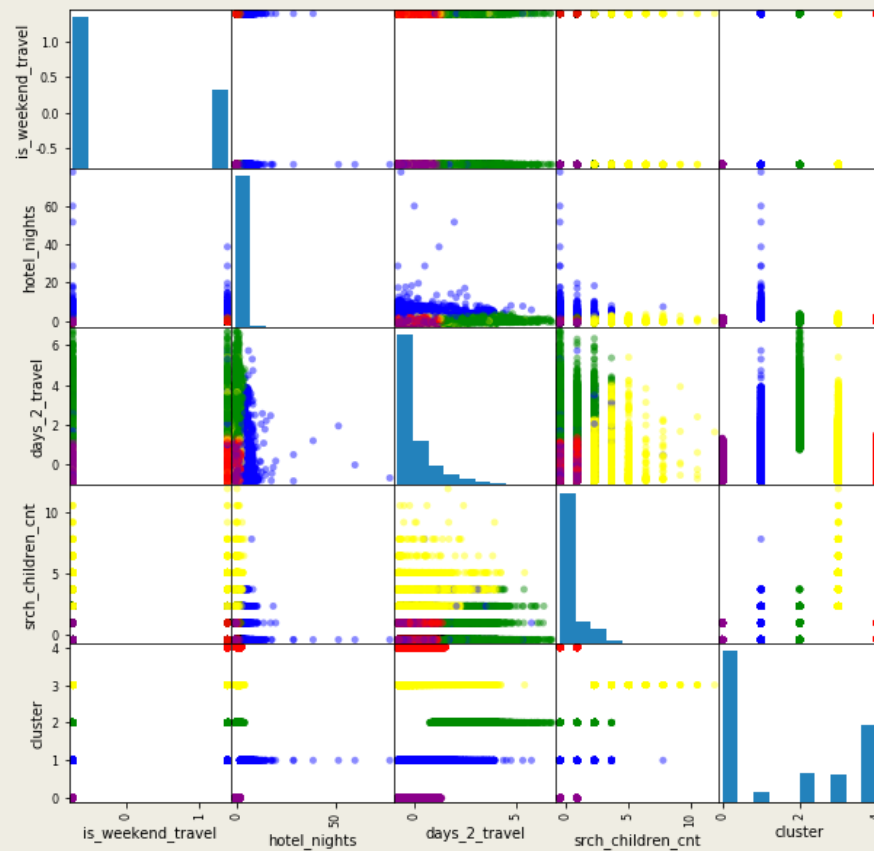
Data exploration: Characteristics of a dataset

- Updated Null values associated with Origin Distance attributes with Mean value
- Dropped Null values for Model dataset
- Kept only the data with Night Spends at Hotel >0
- Kept data with Day to Travel based on search check-In date >0
- Created Indicator for Weekend travel yes now
- Creating Clusters using different attributes

Clustering: using K means Algorithm



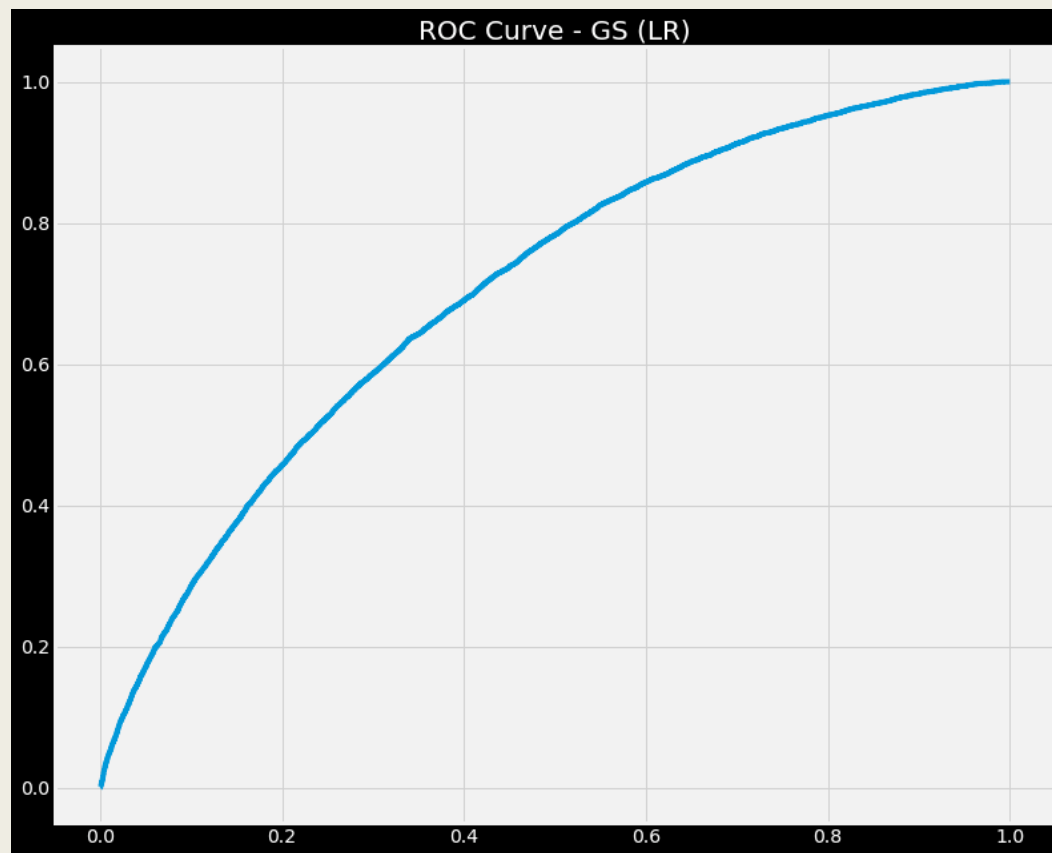
Clustering: Scatter plot for clusters (Kmeans, n= 5)



Models

- Logistic Regression (0. 0.688318722972)
- Ridge Classifier (0.664997519063)
- Random Forest (0.632023711055)

ROC Curve:





Thank You!!!