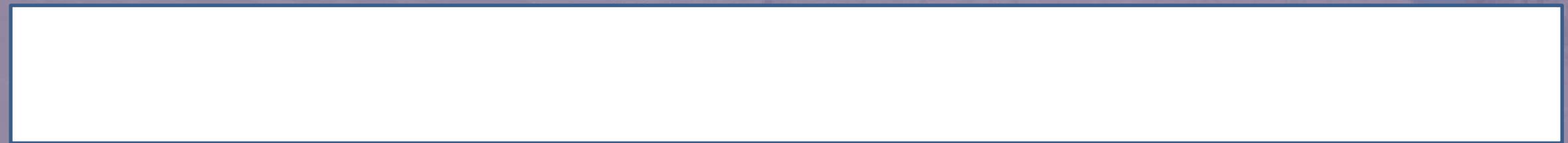




A Data-Driven Approach to Understanding Price Determinants of Ski Resorts





AGENDA

INTRODUCTION OF BUSINESS QUESTION

DATA SOURCE

DATA PREPROCESSING

EXPLORATORY DATA ANALYSIS

MODEL APPLICATION

CONCLUSION



Business Problem

- As new entrants to the ski resort industry, it can be challenging to compete with established players who have a wealth of experience and data to inform their pricing strategies.
- Moreover, with so many factors affecting the success of a ski resort, it can be difficult to identify which ones are most critical to focus on.
- In short, by leveraging data-driven insights, new entrants can make more informed decisions about their pricing strategies and marketing efforts, which can ultimately help them establish themselves in the market and compete with more established players.



Data Source



- ▷ Ski Resort Dataset
([Ski Resort.statistic.](#))

Total Observations: 499

Country: 38

Continent: 5

- ▷ Column including:
['ID', 'Resort', **'Latitude'**, **'Longitude'**, 'Country',
'Continent', **'Price'**, 'Season', 'Highest point', 'Lowest
point', 'Beginner slopes', 'Intermediate slopes',
'Difficult slopes', 'Total slopes', 'Longest run', 'Snow
cannons', 'Surface lifts', 'Chair lifts', 'Gondola lifts',
'Total lifts', 'Lift capacity', 'Child friendly',
'Snowparks', 'Nightskiing', 'Summer skiing']

- ▷ Airport Dataset ([Kaggle](#))

Total Observations: 7698

Country: 38



- ▷ Column including:

['airport_id', 'name', 'city', 'country', 'iata', 'icao',
'latitude', **'longitude'**, 'altitude', 'timezone', 'dst',
'timezone_name', 'type', 'source']

Data Preprocessing

➤ Missing values:

Airports dataframe: 50 missing values "City"

Ski Resorts dataframe: No missing values

➤ Merging the dataset:

Find the nearest airport: KNN with "Longitude" and "Latitude".

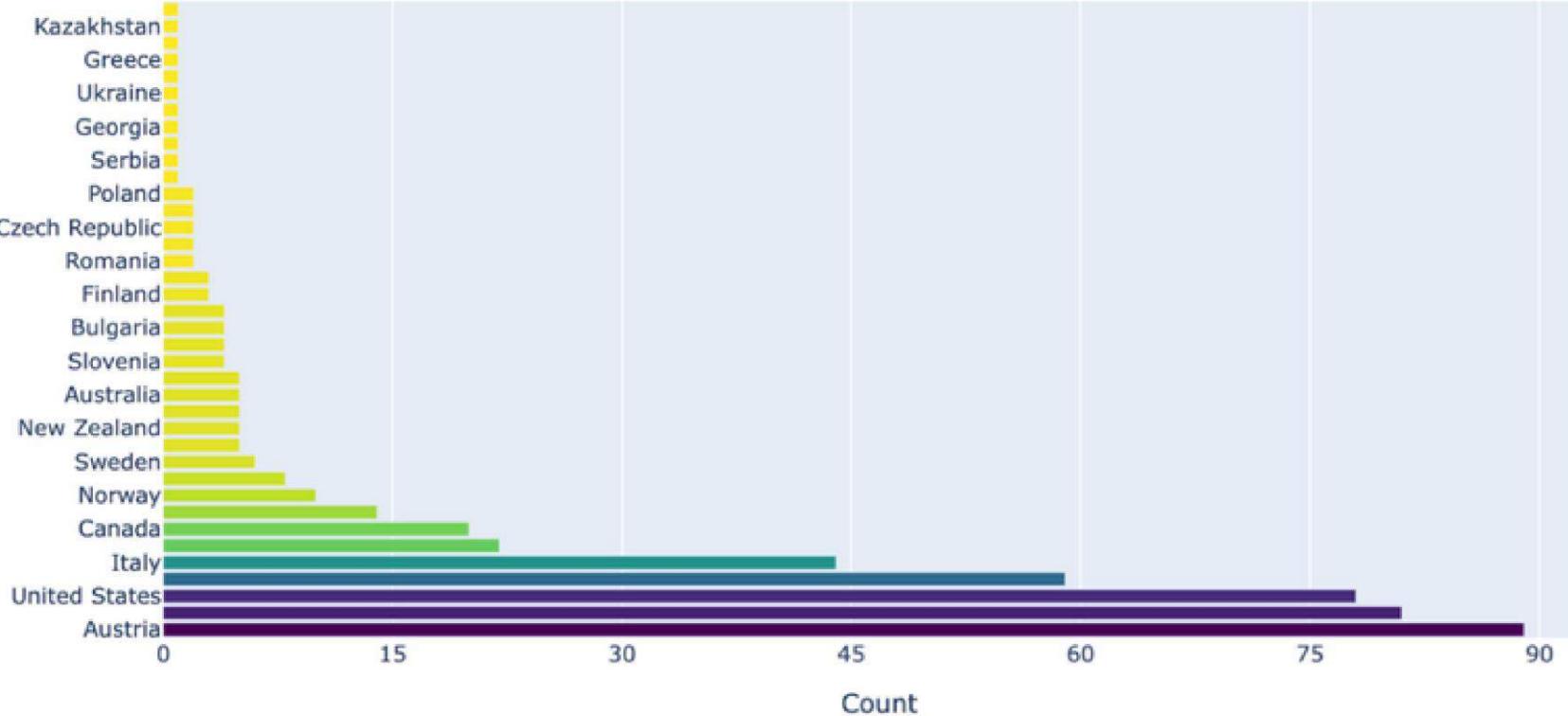
➤ Calculated distance between Resort and nearest airport:
geopy library

➤ Converted categorical variables into dummies:
“Child friendly”, “Snowparks”, “Nightskiing”, and
“Summer skiing”.

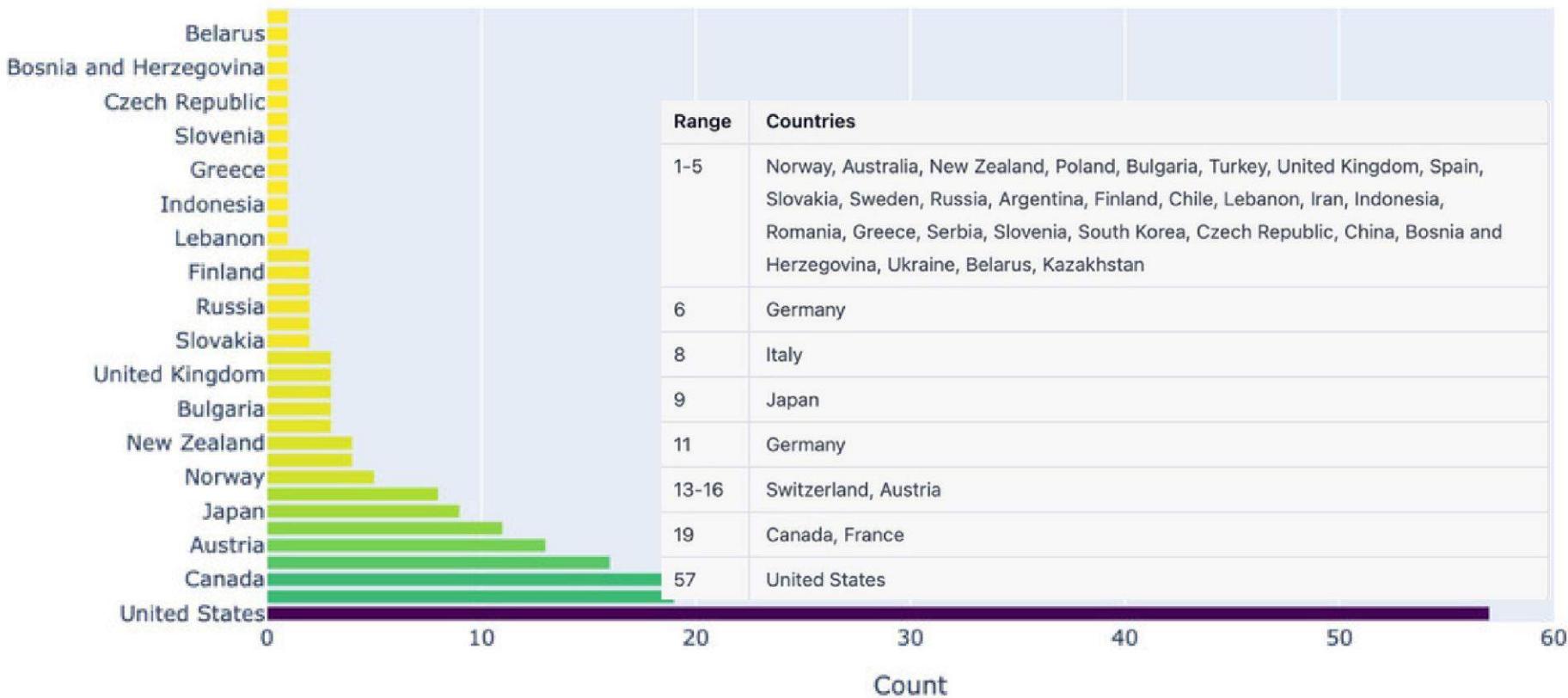
Exploratory Data Analysis



Number of Ski Resorts by Country

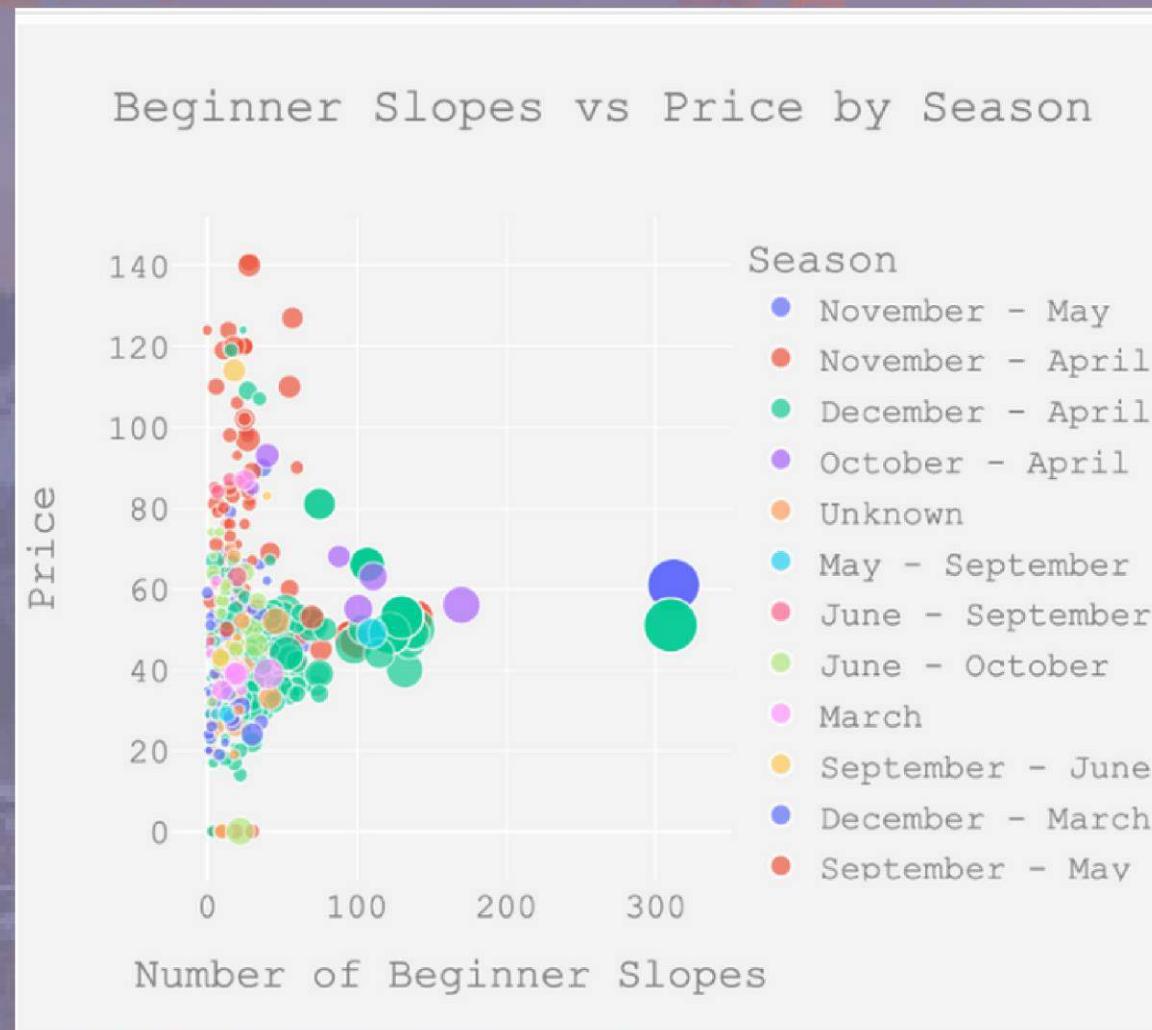


Number of Airports by Country



- Average of 13.13 ski resorts per country.
- Wide range in the number of ski resorts /country, with a standard deviation of 23.79.
- Min is 1 with 11 countries , max is 89 with Austria

Exploratory Data Analysis



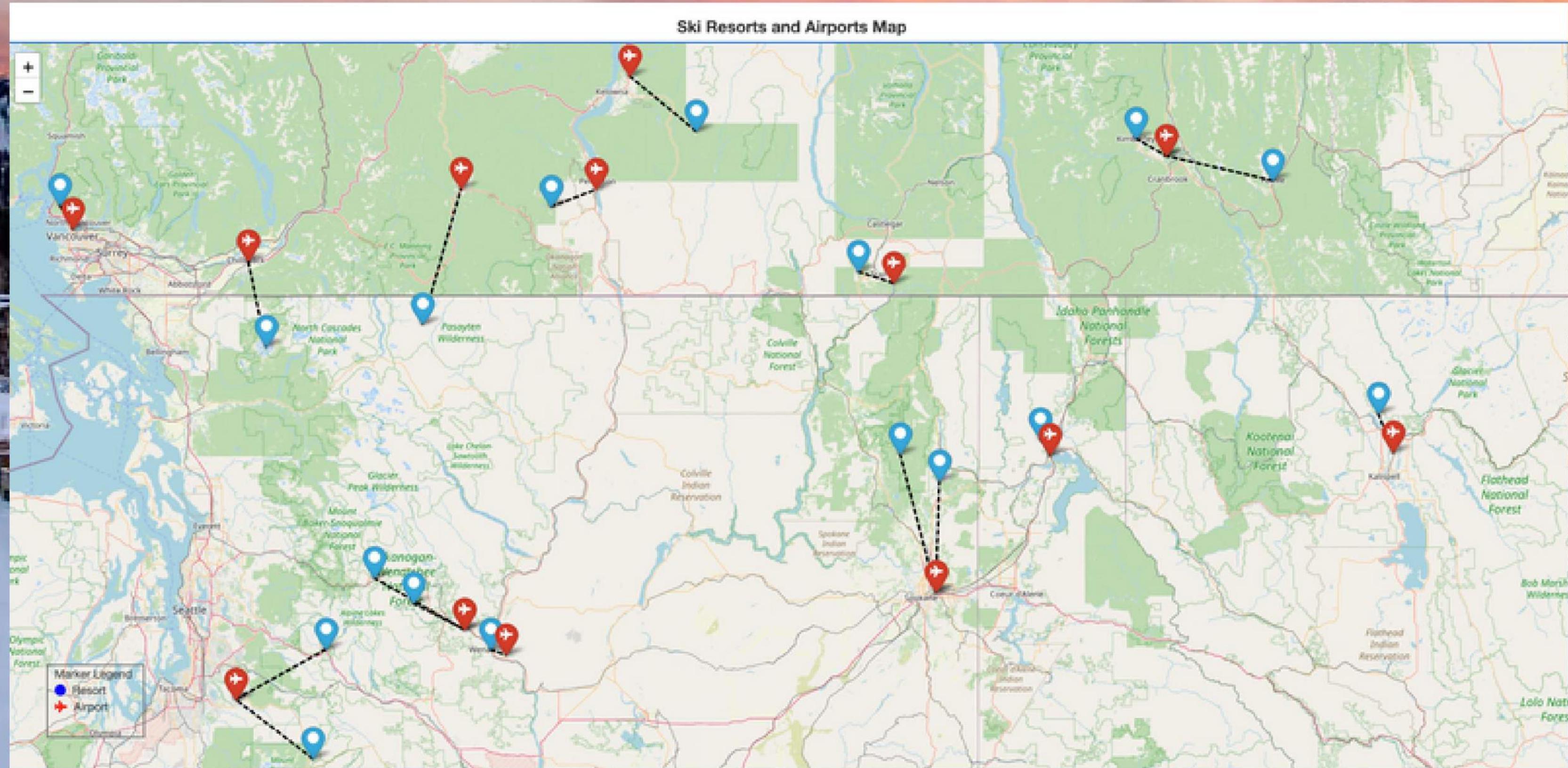
- Range of "Beginner slopes"- wide, Some with 0 others more than 300.
- Distribution of prices is - varied few with high prices (up to 141), majority within 36-54
- Help Ski resort owners - pricing and slope maintenance strategies

Ski Resort Mean price - **€54.22**

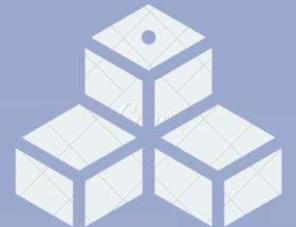
Standard deviation of **€17.57** - variation in pricing between different ski resorts around the world.

Min Avg- **€32.58**(Asia), Max Avg **€76.97** (North America)

Exploratory Data Analysis



Model Application



➤ Multiple Regression Model:

- Supervised technique
- Predictor Variables: “Highest point”, “Beginner slopes”, “Difficult slopes”, “Chair lifts”, “Lift capacity”, “Child friendly”, “Snowparks”, “Nightskiing”, “Summer skiing”, “distance_miles”, dummies for countries, among others.
- Dependent Variable: Price (euro) €

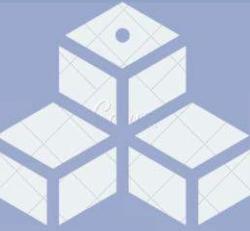


➤ KMeans Cluster Analysis:

- Unsupervised technique
- 5 subsets for each Continent:
 - North America, Oceania, South America, Asia and Europe
- Dropped categorical variables: Resort, Resort_Country, Continent, Airport_City, Airport_Country, Season, Airport Name, Airport ID, Latitude and Longitude of the resorts and the airports.



Model Application- Multiple Regression



➤ Key Insights:

- R2: 0.729

- Statistically significant (P<0.05): "Highest_point", "beginner slopes", "Difficult slopes", "Longest run", "Surface lifts", "Gondola lifts", "Lift capacity", "Child friendly", "Snowparks".

➤ Analysis highlights:

- "Child friendly": Ski Resorts that are considered "Child friendly" have prices that are €26.77 higher than ski resorts that are not considered child friendly.
- "Beginner slopes": One unit of increase of "Beginner slopes" is associated with a -0.11 decrease in the price of a Ski Resort.
- "distance_miles": One unit of increase in distance decreases the price of the Resort.

KODAK PORTRA 400

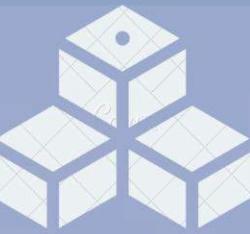
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OLS Regression Results				
Dep. Variable	Price	R-squared	0.729	
Model	OLS	Adj. R-squared	0.683	
Method	Squares			
	coef	std err	P> t	
const	17.36	12.72	0.17	
Highest point	0.00	0.00	0.16	
Lowest point	0.00	0.00	0.64	
Beginner slopes	-0.11	0.05	0.03	
Intermediate slopes	0.01	0.04	0.77	
Difficult slopes	0.25	0.07	0.00	
Longest run	0.50	0.23	0.03	
Snow cannons	0.00	0.00	0.35	
Surface lifts	-0.64	0.15	0.00	
Chair lifts	-0.32	0.28	0.26	
Gondola lifts	-0.60	0.35	0.09	
Lift capacity	0.00	0.00	0.00	
Child friendly	26.77	9.43	0.01	
Snowparks	6.53	1.86	0.00	
Nightskiing	-0.70	1.56	0.65	
Summer skiing	0.97	4.97	0.85	
distance_miles	-0.05	0.06	0.35	

KODAK PORTRA 400

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Model Application- Clustering



North America

- Highest average price amongst all continents
- Clusters 1 & 2 include the majority of child-friendly resorts in this continent
- North America is a good option for clients looking to open luxury ski resorts and/or child-friendly resorts



Europe

- Largest number of resorts in the dataset
- Moderate average price among all clusters
- Many child-friendly resorts
- Europe could be a good option for child-friendly or budget-friendly resorts



South America

- All resorts in this continent offer summer-skiing at a moderate average price
- Good option for summer-skiing resorts

Model Application- Clustering



Asia

- Fewer resorts in each cluster
- Lowest average price among all continent
- Each cluster had a majority of child-friendly resorts
- Highest average distance from airports
- Asia is a good option for child-friendly and budget-friendly resorts



Oceania

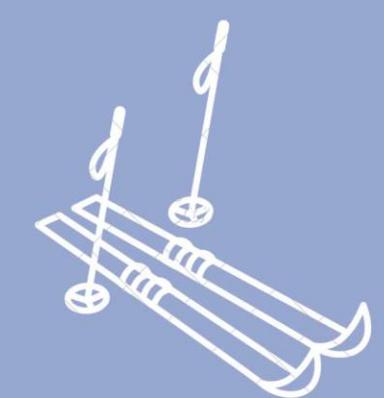
- There are relatively few resorts in Oceania, and all of them are quite distant from airports.
- 2nd highest average price among all continents
- Each cluster in Oceania includes resorts that offer summer-skiing
- Oceania is a good option for luxury summer-skiing resorts



Conclusion



- Overall, based on our insights from both models, North America appears to be the most attractive option for clients looking to open child-friendly and/or luxury ski resorts.
- South America, Asia, and Europe are the most attractive options for clients looking to open budget-friendly , child-friendly and summer-skiing resorts.
- However, market research and additional factors such as client demand and target audience should also be considered before making a final decision.



Data Dictionary

Table	Field	Description
Resorts	ID	Unique identifier for each resort
Resorts	Resort	Name of the ski & snowboard resort
Resorts	Latitude	Latitude for the resort's location
Resorts	Longitude	Longitude for the resort's location
Resorts	Country	Country in which the resort is located
Resorts	Continent	Continent in which the resort is located
Resorts	Price	Ski pass cost for 1 adult for 1 day in the main season (Euro - €)
Resorts	Season	Normal start and end of the ski season at the resort
Resorts	Highest point	Highest mountain point at the resort (meters)
Resorts	Lowest point	Lowest possible point to ski at the resort (meters)
Resorts	Beginner slopes	Total length of "children", "blue", and "green" slopes at the resort (km)
Resorts	Intermediate slopes	Total length of "red" slopes at the resort (km)
Resorts	Difficult slopes	Total length of "black", "advanced", and "expert" slopes at the resort (km)
Resorts	Total slopes	Total length of slopes at the resort (km)
Resorts	Longest run	Longest possible continuous run at the ski resort (km)
Resorts	Snow cannons	Total amount of snow cannons at the resort
Resorts	Surface lifts	Total number of surface lifts, including T-bar, Sunkidslift, Rope lifts and people mover
Resorts	Chair lifts	Total number of chair lifts
Resorts	Gondola lifts	Total number of gondola lifts
Resorts	Total lifts	Total number of lifts
Resorts	Lift capacity	Number of passengers the resort's lift system can move in an hour
Resorts	Child friendly	Is the ski resort child friendly?
Resorts	Snowparks	Does the resort have one or more snowparks?
Resorts	Nightskiing	Does the resort offer skiing on illuminated slopes?
Resorts	Summer skiing	Does the resort offer skiing during the summer?

- Ski resort dataset:
<http://ski-resort-stats.com/find-ski-resort/#1498675249678-9966e624-d30e>

- Airport Dataset:
<https://www.kaggle.com/datasets/syedasimalishah/airports>