

INTRODUCTION

way people travel.

Despite the challenges posed by the

COVID-19 pandemic, a study conducted

by STR and AirDNA found that house

rentals outperformed hotels; among the

most renowned platforms is Airbnb,

which has become a symbol of the

sharing economy and has changed the

This project focuses on Dublin short

term rental market opportunities, by

developing pricing and rate occupancy

prediction models based on machine

learning approaches to identify patterns

that may impact or aid users in making

The concept of this research is to show

the financial feasibility of data services,

as well as how data science can improve

business and operational efficiency.

smarter and cost-effective decisions.

# **DEFINING FINANCIAL RISKS AND MARKET** TRENDS THROUGH PREDICTIVE DATA ANALYSIS

MODULE Problem Solving For Industry

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HOMELY



**OBJECTIVE** 

The aim of this project is to use Machine Learning technologies and online property website datasets to determine financial risks and market trends for real estate investors in Ireland.

#### BACKGROUND

#### REQUIREMENTS

- Provide an easy and efficient solution for users who are searching for properties.
- Design and deploy a prototype that shows the predictions found through Machine Learning techniques.
- Display information regarding a certain property.
- Provide customized search by adding filters to fit users budget, needs, and general lifestyle.

#### MACHINE LEARNING

Since this project consists of analysing and combining six datasets, multiple modelling techniques were used to test the accuracy of these predictions:

- Linear Regression
- Multiple Regression
- K-Nearest Neighbour
- · Lasso and Ridge Regression
- · Sentiment Analysis

# METHODOLOGY

#### CRISP-DM

This framework is divided into six phases that correspond to the data science life cycle. Each phase was completed in order to ensure the project's integrity and long term planning.



## **FINDINGS**

RESEARCHERS

Through Python visualizations we discovered patterns and trends that had a higher likelihood of impacting the final prediction models by analysing each dataset.

 Most Popular Types Of Property Private Rooms and Entire Houses

 Average Price Per Neighbourhood From €88.72 up to €359.31

 Price VS Location Dublin South East Area: Over €130.00 per night



## **DEPLOYMENT TOOLS**



## RESULTS

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> Between the number of modelling methods used, the following options have achieved a greater accuracy:

- Price Prediction
- K-Nearest Neighbour: 85%
- Comments Review Sentiment Analysis: 98%
- Occupancy Rate
- Lasso Regression: 93%



## DASHBOARD

#### View Prototype



# CONCLUSION

As previously discussed, the real estate business has witnessed a major development in the use of data in recent years, and purchases must be thoroughly analyzed, with comprehensive analysis and evaluation of the best investment according to the investor's needs or preferences. By the end of this project, we felt positive that the outcomes outlined have been achieved. The application deployed shows a solution for real estate investments that employs modern technologies to support investors in general in making data-driven decisions.

# REFERENCES

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