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**Assessment Cover Page**

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| *Module Title* | Strategic Thinking |
| *Assessment Title* | Rent Predictor: A Machine Learning Approach to Forecast Dublin Home Rent |
| *Assessment Due Date* | 27th October 2024 |
| *Date of Submission* |  |

**Declaration**

By submitting this assessment, I confirm that I have read the CCT policy on academic misconduct and understand the implications of submitting work that is not my own or does not appropriately reference material taken from a third party or other source.

I declare it to be my own work and that all material from third parties has been appropriately referenced.

I further confirm that this work has not previously been submitted for assessment by myself or someone else in CCT College Dublin or any other higher education institution.

Rent Predictor: A Machine Learning Approach to Forecast Dublin Home Rent

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# Introduction

Rental homes are an integral part of the housing ecosystem, providing an alternative to homeownership. A properly functioning housing market is an essential ingredient of a properly functioning economy and society. (IPOA and IPAV)

From an economic, social and political perspective, housing is currently the greatest challenge faced by Irish policymakers. The housing challenge is manifested in a lack of supply of owner-occupier and rental properties; prohibitively high house prices and rents; and a serious problem of homelessness. (IPOA and IPAV)

# Problem Definition

The inability to provide an adequate supply of suitable and affordable housing supply for those who want to rent has very negative economic and social consequences. These consequences include:

* High and rising rents take spending power out of the economy and render it very difficult for aspiring house buyers to build up a sufficient deposit.
* High and rising house rents put upward pressure on wages, and this undermines national competitiveness.
* The availability of an abundant supply of high-quality housing to rent or purchase at affordable prices is a necessary condition for labour mobility within a country and between countries. For Ireland, inward migration is an essential part of the economic model, and housing can act as a major impediment to such labour flows.  
  (IPOA and IPAV)

# Challenges In the Rental Market:

A new study by economist Jim Power and commissioned jointly by the Institute of Professional Auctioneers & Valuers and the Irish Property Owners’ Association has concluded the rental market is in a state of crisis exacerbated with the exit of non-institutional landlords in significant numbers, reducing supply and putting upward pressure on rents.

The study finds some of the key issues which are listed below,

* The constantly changing and very challenging regulatory and taxation environment that treats private landlords very differently from institutional landlords, is largely responsible for private non-institutional landlords leaving the market.
* RPZs (Rent Pressure Zones) are creating a 2-tier rental market and leading to a situation where maintenance of quality accommodation is not economically justifiable and negatively impacting on capital values

where the property is the subject of the RPZ rules.

* It is likely that landlords that historically charged rents under market rate and are confined to minimal increases arising from RPZ regulation are exiting the market in greatest numbers.
* These landlords are replaced in the market in part by new properties at much higher rents and owned by institutional landlords with no evidence available to confirm if any net additional new properties have come onto the rental system.   
  (Power et al.)

# How Can a Renter be Safe?

As the price of rent in Ireland continues to rise, we list here a few additional tips to help renters during the housing crisis: (Tait)

## Know What You Want

Have a clear idea of what you want. Which areas would suit you for work or schools, what your budget is, how much of a deposit you can afford, furnished or unfurnished etc?

## Have All Paperwork Ready

Have any relevant paperwork such as copies of ID, payslips etc. prepared and ready to go in a folder that you can always bring with you. Alternatively, keep one set of papers at work and another at home so you can quickly go from either place to a viewing.

## Check Average House Prices

Don’t go into a transaction blind. Before heading to a viewing, whip out your smartphone and check average house prices for the area, news reports on the area, and nearby transport and facilities. Also, remember to ask about parking availability if you have a car.

## Stay Within Budget

The general rule for housing is that you shouldn’t spend more than 30% of your monthly income on it. Due to escalating prices, you may have to budget for more, but establish limits. It makes no sense to get a nicer place if you can’t afford to eat or travel to work.

## Visit the Properties

Always visit a property and insist upon seeing inside it before agreeing to rent it. Pictures can be old or deceiving.

## Know Your Rights

As a renter, you should read contracts carefully. If you leave a deposit, demand a receipt. If you’re going to be sharing an apartment, it’s best to try and meet your new roommates beforehand. Also, make sure that you each have your own separate leases, or you could be stuck with paying all the rent if anyone ups and leaves.

(Tait)

# Project Scope

The scope of this project is to focus on one key criterion that can help the renters to decide on the locality based on their affordability to rent. To do that, I shall develop a model using machine learning algorithms like Linear regression, Decision tree and Random Forest that can predict the rent at each area of Dublin based on the number of beds.

This should give an insight into the average rental cost in the coming months at different areas of Dublin and thereby help to plan the relocation.

# Details of Dataset

Residential Tenancies Board is an independent public body that regulates the private rented sector. It is responsible for multiple activities like tenancies registration, dispute resolution, investigation and sanction of landlords. It has also published many numbers of reports and data. (Citizensinformation.ie)

For the specific case study, I will use the dataset available in the below link.

<https://data.cso.ie/table/RIQ02>

# Key Challenges

Above mentioned dataset has some redundant and incomplete data which pose the treat of inefficiency during model training. Therefore, the key challenges are to segregate the useful and valid data from the large dataset, use the right filtering condition and at the same time not to miss on the important parameters.

# Effort & Timeline

Below provided efforts and timelines is an approximate estimate subject to change due to any unforeseen challenges.

## Semester 1:

|  |  |
| --- | --- |
| Activity | Duration |
| Identify and evaluate the dataset | 2 weeks |
| Perceive the possible challenges | 1 week |
| Model selection | 2 weeks |
| Documentations | 2 weeks |

## Semester 2:

|  |  |
| --- | --- |
| Activity | Duration |
| Data cleaning | 4 weeks |
| Model training and testing | 3 weeks |
| Graphical presentation | 1-2 week |
| Documentations | 2 weeks |

# 

# References

(IPOA and IPAV)

IPOA, and IPAV. *THE IRISH PRIVATE RENTAL MARKET*. IPAV.ie, June 2022.

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(Power et al.)

Power, Jim , et al. *Housing Policy Needs to Adjust to Address Market Failures in the Rental Sector -New Study*. 22 May 2022.

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(Tait)

Tait, David. “The 2022 Housing Crisis of Ireland: Fact or Fiction?” *Selectra*, 25 May 2022, selectra.ie/moving/tips/housing-crisis-ireland.

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