House Rent Prediction System using Machine Learning and Deep Learning

A Minor Project Synopsis Submitted to

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal
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Under the Supervision of
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1. Abstract

Whenever the property is offered for rent, it's difficult to decide its price. It requires much efforts of observing and researching market price for a specific location. It can also be difficult to calculate how much a tenant will spend on rent based on factors like location and amenities. Due to this both tenant and landlord faces several issues regarding the price offered for rent.
So, the proposed solution is to develop a web application to determine the cost of a rental property based on its location, surroundings, and amenities.

2. Introduction of the Project

Deciding rents for property and searching for rental properties is a very time-consuming task and it takes much effort of researching rents for a particular location. This project makes this task easy for costumers by developing a model which can predict the rent for a specific location based on its location, surroundings, and amenities.
This project aims to develop a machine learning and deep learning model to train the machine such that it can predict the rent of any location in Mumbai. In this project, user will upload certain specific images of the condition of the house like furniture and certain details of the house and based on this we will predict the rent of house.

3. Objective

- ✓ The main objective of this project is to get the correct price of the house that is to be rented
- ✓ This website lets people know about the ongoing rent of property and it's easy for them to decide whether they want to buy a particular property or not.
- ✓ This will be helpful for the people living in rented flats/houses as they can upload specific images of the property and get the exact renting price for the particular property.

- ✓ To save the commission given to brokers for referencing any properties.

4. Scope

The scope of this project is the people of our country who are willing to rent their houses and those who are searching for houses/flats/apartments on rent in Mumbai. This web application will correctly predict the rent for their properties. Also, this system saves the commission given to brokers for referencing any properties.

5. Study of Existing System

Still there are no online systems available that can predict rent price of any house/flat/apartment. Now also people use traditional approaches to consult any broker for detecting and researching for price of properties that they want to lend or buy it on rent. This system can be proven as a revolution to estimate precise value for houses/flats and apartments. This project uses image detection and classification for estimating conditions of houses which is not used by any software or company till now.

6. Project Description

This project aims at developing a system which can predict prices of rent of houses, flats and apartments in Mumbai baes on conditions, location and amenities of properties. To achieve above stated goal, this project is developed by training machine learning model and uses deep learning concepts on images to extract information like type and condition of furniture present in the house.

This system is a web based application which takes a form from user in which they feed necessary information like locations, amenities and components like number of rooms halls and washrooms, presence of balcony or not and its specific locations .

This form also asks user to feed in necessary images of interior of houses/flats and apartments that is to be rented to predict their conditions.

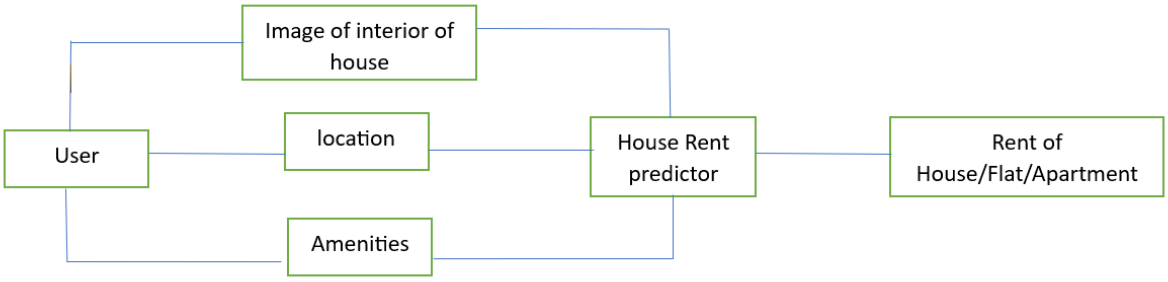

Figure-1

7. Methodology/Planning of the Project work

To achieve the above stated objectives:

1. Creation of dataset: Machine is first trained on a predefined dataset so that it gets the idea about the patterns observed and predict precisely on unknown data.
2. Cleaning of dataset: In this project, the dataset is created by webscrapping content from magic bricks website and hence there is lot of noise that hinder the process so cleaning of data is required.
3. This project is divided into two major modules, one is machine learning module where model is trained using regression techniques and another is deep learning module where object detection and classification related techniques are applied on images to extract some useful information related interior of houses/flats and apartments.
4. Machine learning module: To train machine learning model, we use Regression techniques to split the data into train and test sets and perform lasso regression to achieve desired accuracy.
5. Image classification and detection module: uses dataset of various images of furniture and apply object detection on some unknown images given by user.
6. Combining both modules to predict the final rent.
7. Development of web application using Flask, FlaskSQLAlchemy, HTML, CSS, JavaScript, so that user can interact with the system.

8. Expected Outcome

This project is expected to predict a precise and accurate value of house rent asked by user in Mumbai. The model developed in this project will take image as an input and perform some classification operation to predict a precise value of rent. Through this application users can save a lot of time in researching for market price of house/flats/apartments for a specific location in Mumbai.

9. Resources and Limitations

- **Non-Functional Requirements**:

This website can run on any web browser.

- ❖ Security
- ❖ Usability
- ❖ Scalability
- ❖ Performance
- ❖ Maintainability

- **Technologies Used:**
  - ❖ Beautiful Soup: used to webscraps data from sites to prepare dataset.
  - ❖ NumPy/Pandas: Modules of python to work on datasets.
  - ❖ Machine Learning
  - ❖ Deep Learning
  - ❖ Python
  - ❖ Flask/Bootstrap/HTML/CSS/JavaScript: To build the frontend and backend of website.
- **Hardware Requirements:**
  - ❖ Operating System: Windows 10 or higher version.
  - ❖ Minimum 16GB RAM.
  - ❖ Python IDE

- **Limitation**

  Since, property prices fluctuate between high and low frequently thus user sometimes cannot get the result on the running property prices as this system is developed as per the data collected in January 2023.

10. Conclusion

An online system for predicting house rent is an efficient and time saving way to deal with problems of uncertainty and regular changes in market prices. This system saves money as well as effort of searching for houses/flats/apartments on rent and proved to be the efficient solution for all problems stated above.

11. References

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