National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS-370: Artificial Intelligence

Class: BSCS-10B

Group Project

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Task: Artificial Intelligence Project			
Submission Date: Wed 5th April 2023		**Instructor**: Dr. Hashir Kiani	
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Problem Statement and Task Definition:

Pakistan is a country with a population of over 220 million people, and about 25% of the population lives in rented housing. Finding suitable rental properties that meet the tenants' needs and are affordable for them is a challenging task, and it becomes even more challenging during these difficult times. This problem affects both tenants and property owners, as tenants struggle to find suitable rental properties, and property owners struggle to find suitable tenants for their properties.

This project aims to address this problem by developing a model that helps tenants find affordable rental places that meet their specific needs and preferences. Since the scope of this project is quite broad, we will also be continuing this as our FYP.

Input/Output Behavior:

The model will take into **(Input)** various factors such as the tenant's income, preferred location, and proximity to essential amenities. By doing so, the system seeks to address the challenges faced by tenants in finding affordable rental places that meet their specific needs and preferences

As **Output,** the model will help tenants identify rental places that meet their specific location preferences (rental places that are near to tenants' workplaces, children's schools, markets, and hospitals) and financial constraints

An Evaluation Metric:

The success of our system solely depends on how accurately the prediction is done. Since our main goal is to ensure that tenants find affordable rental places and property owners find suitable tenants for their properties, accurately predicting such locations would be our evaluation criteria.

Baseline and Oracle

Baseline: Location-Based Classifiers – We will use some location-based algorithms as our baseline to identify rental places that meet the specific location preferences and financial constraints of tenants.

Oracle: Human-level Performance – Since there cannot be a location that is 100% ideal for a person therefore we will be using humans as an oracle to decide on the most ideal location based on majority votes.

Methodology:

The proposed model will utilize both quantitative and qualitative data to develop a comprehensive database of rental places that meet the specific requirements of tenants. The database will be updated regularly to ensure that it remains current and relevant.

The model will be developed using open-source software and made available to tenants free of charge. The model will also be easily accessible through a user-friendly interface that can be accessed via a web browser or mobile application.

To achieve the objectives of this project, the following Methadology will be used:

- **Literature review**: A comprehensive review of existing literature on affordable rental housing will be conducted using academic databases such as JSTOR, Google Scholar, and ProQuest.

- **Surveys**: Surveys will be conducted to collect quantitative data from tenants on their rental housing choices, location preferences, and financial constraints. The surveys will be distributed online using survey tools such as Google Forms or SurveyMonkey.

- **Interviews and Focus Group Discussions:** Qualitative data will be collected through in-depth interviews and focus group discussions with tenants, landlords, and real estate agents. The interviews and discussions will be conducted using video conferencing tools such as Zoom or Microsoft Teams.

- **Location-Based Algorithms:** Location-based algorithms will be used to develop a comprehensive database of rental places that meet the specific needs and preferences of tenants. These algorithms will be developed using open-source software and programming languages such as Python.

- **Data Analysis:** The collected data will be analyzed using statistical software such as SPSS or R to identify key trends and patterns. The data analysis will be used to develop the proposed model and evaluate its effectiveness.

- **Web Development:** The proposed model will be developed using web development tools such as HTML, CSS, and JavaScript. The model will be accessible via a web browser or mobile application.

Overall, the use of these tools will enable the development of a comprehensive model that helps tenants find affordable rental places that meet their specific needs and preferences.

Description of the challenges:

Our main challenge would be collecting such a huge amount of sensitive data like the PayScale of the people of Islamabad, and the rent of houses in different sectors, etc. Such data are not commonly available and would require gathering them from scratch.

Addressing Those Challenges:

The best way to address such challenges would be to gather data through online forms and surveys. Focus group discussions would also help us a lot in accessing the data required for our project