Prediction about decorating buildings with natural elements

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***Abstract*—**

Machine learning model predictions allow businesses to make highly accurate guesses as to the likely outcomes of a question based on historical data, which can be about all kinds of things – customer likelihood, possible fraudulent activity, and more.

Banks and other businesses in the financial industry use machine learning technology for two key purposes: to identify important insights in data, and prevent fraud. The insights can identify investment opportunities, or help investors know when to trade.

Machine learning in business helps in enhancing business scalability and improving business operations for companies across the globe. Artificial intelligence tools and numerous ML algorithms have gained tremendous popularity in the business analytics communityIn this project ,we used and like to use algorithms DecisionTreeClassifier, RandomForestClassifier, KNeighborsClassifier, MLPClassifier and KMeans.

We collected data is used to measure the quantity willing of customers.

I. INTRODUCTION

We all like green, everybody loves trees, but that is the weakness that is being exploited here, In cloaking their proposals in fluffy flora. developers and architects are attempting a sleighy of hand, a misdirection. Even worse, this fashion reveals a collapse in confidence in the language and power of architectural expression.

It is an admission of defeat a retreat from the responsiblity of designing elevation to enhance a city through an architecture of intelligence, elegance and intent rather than a kind of straggly green comb over.

we are here to decorate the buldings by using green plants and natural things.
Here, we are researching decorating demand forecasting methods using collecting data such as the information of every customer what are they like and which types of things they want to use.

II. BACKGROUND STUDY/LITERATURE REVIEW

THIS TREE-COVERED CHINESE HOTEL TAKES 'GREEN ARCHITECTURE' TO ANOTHER LEVEL

Like his past projects, the Mountain Forest Hotel will be built with sustainability in mind — it's a way to clean up the surrounding air and inject some green into a landscape of steel and concrete.
Plants will cover the building from its foundation to its roof. Almost the entire structure will feature trees and shrubs.
Ultimately, Boeri says he wants to meld his tree-covered buildings with nature.
"Symbiosis is the goal," he explains on his website. Instead of designing buildings that live outside their natural environment, Boeri wants to weave them into the larger ecosystem.

ARE SUSTAINABLE BUILDING TECHNIQUES THE FUTURE ?

Sustainability is the future. People around the world want to do their part to preserve Earth as water levels rise along with global temperatures. These desires extend to the construction industry. This sector has earned a reputation for being slow to change, but those notions are wearing away. Contractors are making significant efforts to meet client needs and appeal to real estate investors — which often means going green.
Eco-friendly building is far from a fad. It’s here to stay, and it’s likely to overtake current unsustainable building techniques. The widespread acceptance of environment-first construction could spell the difference between a depleted world and a thriving one.
The modular building technique allows contractors to create a structure off-site and later transport it to the end location. They take less time and use fewer materials to complete a project, yet end with the same high-quality results. Once the building reaches the end of its use, the company can disassemble it and use it for another assignment. In addition, builders work at higher efficiencies because have to contend with weather delays or other mishaps.

Green buildings can bring fresh air to design

Throughout the world architects are designing green buildings, whether it’s in their sustainable construction, environmentally friendly operation or actually green by style. It’s broadly titled biophilia, connecting people with nature, and it can lead to some creative and innovative designs. But now we are finding that literally greening the world — by covering building walls and roofs with vegetation — can also come with some unexpected problems.

Easyhome Huanggang Vertical Forest City Complex

Located in the city of Huanggang in Hubei province, the **Easyhome Huanggang Vertical Forest City Complex** covers an area of 4.54 hectares, and has been designed to create a new green complex capable of integrating buildings for residences, hotels and large commercial spaces. The complex, intended to create a completely innovative green space for the city, meets the daily needs of a number of different individuals, including residents and temporary guests, inhabitants and tourists. The project comprises five towers, two of which are residential and designed as vertical forests capable of providing a new life experience for the surrounding urban and natural area. The intervention underlines the fourth generation building sector innovation involved which manages to combine the needs of the internal market with traditional residences, to provide advanced technologies and radically change the urban landscape and people's expectations for a future life in sustainable cities. The urban complex is located in an area bounded by three streets and each of the different functional areas is connected to an open public space.

Indoor environment quality interrelated with occupants' health. Green buildings because of using green materials with lower impacts on occupants' health and lower indoor pollution, have high quality of indoor environment compared non-green buildings. These buildings provide better IAQ and ventilation, comfort
thermal, standard humidity level as well as sufficient lighting and acoustics system. These facilities positively affect IEQ. Consequently occupants will enjoy healthier and comfortable environment. High indoor
environment quality not only improves occupants' health, but also ameliorates their performance, productivity and wellbeing. Thus it brings enormous of social and economic benefits in local and national level.

From the researches, we clearly understand that the authors try to discover the best way of this sector and how to develop and it's future. But we think the research are not fully complete because our idea is unique and we don't find any most similar project like ours.

III. METHODOLOGY

In this project , we used Google Colab as a machine learning tool.

A. *Dataset*

The dataset about decorating building is a primary level dataset. We have collected all of our data from google form. This dataset presents a challenge to researchers who want to explore the topics of this prediction. We have researched many datasets before collecting our dataset. After researching dataset we provide our customer a google form to fill up their information.

Data Preprocessing

Data preprocessing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.When creating a machine learning project, it is not always a case that we come across the clean and formatted data. And while doing any operation with data, it is mandatory to clean it and put in a formatted way. So for this, we use data preprocessing task.

	Gender	Age	address	profession	willing
0	0	0	4	1	0
1	0	0	4	1	1
2	1	0	3	1	0
3	1	0	4	1	0
4	1	0	4	1	0

Algorithms we have used

Decision Tree Classification:

Key Points for using

Decision trees provide an effective method of Decision Making because they:

- Clearly lay out the problem so that all options can be challenged.
- Allow us to analyze fully the possible consequences of a decision.
- Provide a framework to quantify the values of outcomes and the probabilities of achieving them.
- Help us to make the best decisions on the basis of existing information and best guesses.

As with all Decision Making methods, decision tree analysis should be used in conjunction with common sense – decision trees are just one important part of your Decision Making toolkit.

Random Forest Classification:
Random forests (RF) are basically a bag containing n Decision Trees (DT) having a different set of hyper-parameters and trained on different subsets of data. Let's say I have 100 decision trees in my Random forest bag!! As I just said, these decision trees have a different set of hyper-parameters and a different subset of training data, so the decision or the prediction given by these trees can vary a lot. Let's consider that I have somehow trained all these 100 trees with their respective subset of data. Now I will ask all the hundred trees in my bag that what is their prediction on my test data. Now we need to take only one decision on one example or one test data, we do it by taking a simple vote. We go with what the majority of the trees have predicted for that example.

K Neighbors Classification:
It is advised to use the KNN algorithm for multiclass classification if the number of samples of the data is less than 50,000. Another limitation is the feature importance is not possible for the KNN algorithm.

This algorithm used for both classification and regression problems. KNN algorithms use data and classify new data points based on similarity measures. It used in the variety of applications such as finance, healthcare, political science, handwriting detection, image recognition and video recognition also.
Sometimes, K Neighbors Classification is not easy to computation. Because the computation cost of this is little high.
K Means:

Decision Tree classification is a Supervised learning technique that can be used for both classification and Regression problems, but mostly it is preferred for solving Classification problems. It is a tree-structured classifier, where internal nodes represent the features of a dataset, branches represent the decision rules and each leaf node represents the outcome.

MLP Classification:

Gradient boosting classifiers are a group of machine learning algorithms that combine many weak learning models together to create a strong predictive model. Decision trees are usually used when doing gradient boosting. Gradient boosting models are becoming popular because of their effectiveness at classifying complex datasets, and have recently been used to win many Kaggle data science competitions**.**

Random Forest Classification:

Random forests is a supervised learning algorithm. It can be used both for classification and regression. It is also the most flexible and easy to use algorithm. A forest is

comprised of trees. It is said that the more trees it has, the more robust a forest is. Random forests creates decision trees on randomly selected data samples, gets prediction from each tree and selects the best solution by means of voting. It also provides a pretty good indicator of the feature importance.

Random forests has a variety of applications, such as recommendation engines, image classification and feature selection. It can be used to classify loyal loan applicants, identify fraudulent activity and predict diseases. It lies at the base of the Boruta algorithm, which selects important features in a dataset.

IV. RESULT AND ANALYSIS

RESULT AND ANALYSIS
After applying various Machine Learning Algorithms on the dataset we got accuracies as mentioned below.

Decision Tree gives highest accuracy of approximate 79 %.

Algorithm	Accuracy
Decision Tree	0.7910447761194029
Random Forest	0.7860696517412935

V. CONCLUSION

Our research is predicting how many people are willing to decorate their building/apartment. In this case, we collected data from google form. In this data set we impose various machine learning algorithm like Decision Tree, Random Forest. In no soon we will use various algorithm like K Neighbors, K Means, MLP. In this project we get the approximate accuracy 79%. We will try our best to improve.

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