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Fig1. Count of Different Permit Type

The bar graph illustrates the number of various building consent kinds in the USA, and it is clear from the graph that the "Electric wire" permit type has a much larger count than other permit types. The count shows how many instances of each type of permission there are in the dataset. To identify the kind of work or activity being carried out, a building permit is given a specific category or classification known as a permit type. Permit types in the context of buildings might range from electrical permits to plumbing licenses to construction permits to rehabilitation permits and more. Each sort of permission has a unique set of rules, conditions, and steps that must be taken to receive the permit.

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Fig2. Bar graph of different Fee paid.

The fees paid for the approval of permits, including building fees, zoning fees, and other fees, are shown in the bar graph. The building fee is specifically related to the price of applying for building permits for new projects or renovations. It pays for the costs associated with the inspections, administrative procedures, and plan reviews necessary to guarantee adherence to building codes and regulations. On the other hand, zoning fees are costs associated with reviewing and processing permits linked to zoning regulations. These expenditures are incurred when evaluating whether proposed developments or land use changes comply with zoning regulations and assessing compliance. The term "other fees" refers to any additional fees or assessments not specifically designated as building or zoning fees. Administrative costs, impact fees, and plan review costs are a few examples of these fees. The building charge is represented in the bar graph with the highest percentage, suggesting that it makes up many of the overall fees paid for permit approvals. This shows that the entire fee structure is greatly influenced by the costs related to construction or repair projects.

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Fig3. Count of Applied application and Approved application monthly

The building permit data's month-by-month breakdown of the number of applications start dates and issue dates is shown in a line graph. A noteworthy surge in the number of issue dates is shown on the graph for the fifth month of the year. This finding shows that a sizeable number of applications submitted in earlier months get approved during this time frame. The relationship between the application starts date and the subsequent issue date is clarified by this information, which also throws light on the dynamics and timetable of the approval process for construction permits.

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Fig3. Processing Time Frequency.

The frequency distribution of the processing time for building permits is shown by the histogram plot. The processing time column is an essential part of the construction permit data since it offers useful details about how long the approval process takes. It displays the amount of time that has passed between the application's submission and the permit's final determination. We can assess the efficiency and timeliness of the system for approving building permits by looking at the histogram, which provides insights into the distribution and frequency of various processing time intervals. This information can help with trend analysis, bottleneck identification, and process improvement to guarantee prompt and effective permit issuing.

List of applicable techniques

A binary classification problem in machine learning can be used to pose the challenge of determining the likelihood of obtaining a building permit. Predicting whether a given set of characteristics or factors related to a construction project will lead to the issuing of a permit (class 1) or not (class 0) is the objective. To address this issue, an assortment of machine learning models can be used. For binary classification tasks, a few popular models include

1.Logistic Regression

2.Decision Trees

3.Random Forests

4.Naive Bayes

5.K-Nearest Neighbors (KNN)

6.Ensemble methods (such as AdaBoost or Bagging)

7.Support Vector Machines (SVM)

8.Gradient Boosting algorithms (such as XGBoost or LightGBM)