

LOW LEVEL DESIGN (LLD)

AIRBNB DATA ANALYSIS

DOCUMENT VERSION CONTROL

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ABSTRACT

Airbnb is an American company that facilitates an online marketplace for lodging, primarily homestays for vacation rentals, and tourism activities. It basically connects travelers with local hosts who want to rent out their homes with people who are looking for accommodations in that locality. On the other hand, this platform enables hosts to list their available space and earn extra income in the form of rent and it also enables travelers to book unique homestays from local hosts, saving them money and giving them a chance to interact with locals. In the world of rising new technology and innovation, Travel industry is advancing with the role of Data Science and Analytics. Data analysis can help them to understand their business in a quite different manner and helps to improve the quality of the service by identifying the weak areas of the business. This study demonstrates how different analyses help out to make better business decisions and help analyze customer trends and satisfaction, which can lead to new and better products and services. Different analyses performed such as Exploratory Data Analysis and Descriptive Analysis on a variety of use cases to get the key insights from this data based on which business decisions will be taken.

INTRODUCTION

What is a Low Level Design Document?

The goal of LLD or a low-level design document (LLDD) is to give the internal logical design of the actual program code for AirBNB Data Analysis. LLD describes the class diagrams with the methods and relations between classes and program specs. It describes the modules so that the programmer can directly code the program from the document. Low-level design is a detailed description of every module of software. It describes every module in detail by incorporating the logic behind every component in the system. It delves deep into every specification of every system, providing a micro-level design.

Scope

Low Level Design (LLD) is a component level design process that follows a step by step refinement process. This process can be used to design data structure, required software architecture, source code and ultimately performance algorithm. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

PROJECT INTRODUCTION

The objective of the project is to perform an exploratory data analysis, data pre-processing, data cleaning & imputation and at the end, apply different Data Visualization techniques to get the meaningful insight from the given data.

PROBLEM STATEMENT

This project aims to apply some amazing Python Libraries such as Plotly and Seaborn which will give a boost to our visual understanding of the data.

DATASET INFORMATION

As we have seen earlier, in our listings dataset, we have around 1.19 Lakhs of records with 20 different features. Features are distributed as 10 Continuous features and 10 Categorical features and in our reviews dataset, we have around 3.44 Lakhs of records with 6 different features among them there are 3 Continuous features and 3 Categorical features. These datasets are given in the form of Comma Separated Value (.csv) format

ARCHITECTURE

The architecture for an Airbnb data analysis project typically involves several components and steps to process and analyze the data. Here's a high-level description of the architecture for an Airbnb data analysis project:

Data Collection: The first step is to gather the necessary data from Airbnb. This can include data on listings, reviews, bookings, host information, and more. The data can be obtained through Airbnb's public APIs, data scraping, or by downloading publicly available datasets.

Data Storage: Once the data is collected, it needs to be stored in a suitable data storage system. Common options include relational databases (such as MySQL, PostgreSQL, or SQL Server) or NoSQL databases (such as MongoDB or Elasticsearch). The choice of data storage depends on factors such as the volume of data, the complexity of relationships, and the requirements of the analysis.

Data Cleaning and Preprocessing: Before performing analysis, the collected data needs to be cleaned and preprocessed. This involves tasks such as handling missing values, removing duplicates, standardizing data formats, and transforming the data into a suitable structure for analysis.

Data Transformation and Integration: In some cases, additional data sources might be required to enrich the analysis. This could include external datasets such as geographical data, demographic data, or weather data. Data transformation and integration techniques, such as data joins and merges, are used to combine different datasets and create a unified view for analysis.

Data Analysis and Visualization: Once the data is prepared, various data analysis techniques can be applied to gain insights. This can involve statistical analysis, exploratory data analysis, data mining, and machine learning algorithms. Visualization tools, such as Tableau, Power BI, or Python

libraries like Matplotlib or Seaborn, are used to create visual representations of the data and communicate findings effectively.

Deployment and Reporting: The analyzed results and visualizations can be deployed in different ways to share insights with stakeholders. This can include creating interactive dashboards, generating reports, or building web-based applications. The choice of deployment method depends on the intended audience and their requirements for accessing and interacting with the analysis results.

Ongoing Monitoring and Iteration: Data analysis projects are often iterative processes, where insights and findings lead to further questions and refinements. It's important to monitor the performance of the analysis over time, update the data as new information becomes available, and iterate on the analysis to gain deeper insights or address emerging questions.

Overall, the architecture of an Airbnb data analysis project involves data collection, storage, cleaning, preprocessing, analysis, visualization, and deployment stages. The specific tools and technologies used can vary based on the project requirements and the expertise of the data analysis team.

TABLEAU DASHBOARD

Tableau is a leading data visualization and business intelligence tool that empowers users to create interactive and visually compelling dashboards and reports. Here's a Tableau version of the description:

Tableau is a robust data analysis and visualization platform that enables users to explore and present data in a user-friendly and intuitive manner. It offers a wide range of features and capabilities that make it a popular choice for businesses and analysts.

Data Connectivity: Tableau supports connectivity to various data sources, including spreadsheets, databases, cloud-based platforms, and web services. It provides native connectors to popular data sources such as Excel, SQL databases, Salesforce, and Google Analytics, allowing users to seamlessly connect and integrate their data.

Visual Exploration: With Tableau, users can easily drag and drop data fields onto the canvas to create dynamic visualizations. The platform offers a vast library of charts, graphs, maps, and other visual elements that can be customized to convey insights effectively. Users can interact with the visualizations, apply filters, and drill down into the data to explore different perspectives and uncover hidden patterns.

Dashboard Creation: Tableau allows users to combine multiple visualizations into interactive dashboards. Users can arrange and organize their visualizations in a layout that suits their needs, enabling them to create comprehensive and visually appealing dashboards. Dashboard elements can be linked to create interactivity, allowing users to explore the data and make discoveries.

Advanced Analytics: Tableau provides advanced analytics capabilities that empower users to perform calculations, apply statistical functions, and perform complex data modeling. Users can create calculated fields, use parameters for dynamic analysis, and leverage built-in statistical functions for

deeper insights. Tableau also supports integration with popular programming languages such as R and Python for advanced analytics and machine learning.

Sharing and Collaboration: Tableau offers various options for sharing and collaborating on dashboards and reports. Users can publish their visualizations to Tableau Server or Tableau Online, enabling secure access for authorized users within their organization. Dashboards can also be shared via Tableau Public or embedded into websites and applications, allowing for broader dissemination of insights.

Performance Optimization: Tableau provides features to optimize performance when working with large datasets or complex visualizations. Techniques such as data extracts, data blending, and data source filters can be employed to enhance performance. Tableau also offers options for caching, data aggregation, and incremental data updates to improve responsiveness and reduce query times.

Tableau offers a user-friendly interface, powerful data visualization capabilities, and a robust set of features for data exploration and analysis. Its versatility and flexibility make it a valuable tool for individuals and organizations across various industries to derive insights from their data and make data-driven decisions.

AIRBNB DATA ANALYSIS VISUALIZATION DASHBOARD

