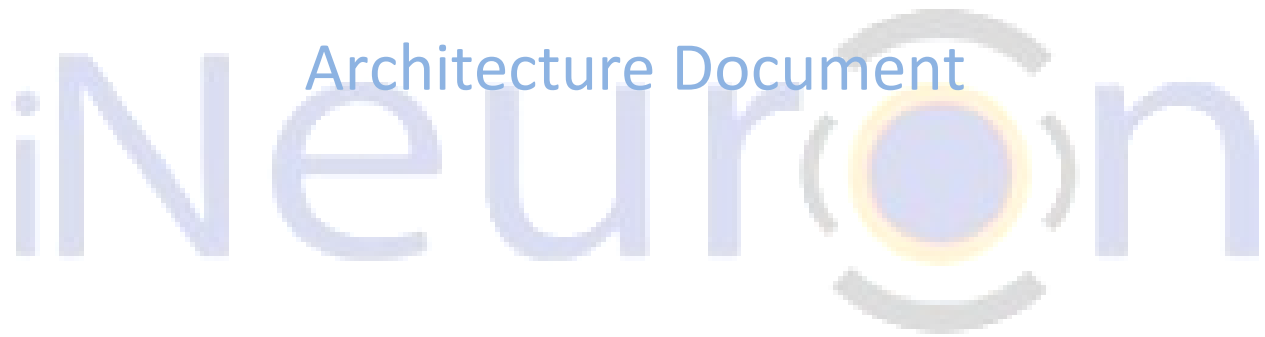


WINE QUALITY ANALYSIS

Architecture Document



DOCUMENT VERSION CONTROL

Date Issue	Version	Description	Author
07/04/2023	1	Initial Architecture – V 1.0	SHRUTI
14/04/2023	2	Final Architecture – V 2.0	SHRUTI

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ABSTRACT

Wine is an alcoholic beverage made from fermented grapes or other fruits. The process of making wine involves crushing and fermenting the fruit, usually grapes, to produce a liquid that contains alcohol.

Wine is classified based on several factors, including the type of grape used, the region where the grapes were grown, and the production methods used. Some common types of wine include red wine, white wine, rosé wine, and sparkling wine. Wine can also be classified as dry, semi-dry, or sweet, depending on the residual sugar content.

The objective of the project is to build a predictor that will help to understand the wine quality and its data pattern. The goal is to model wine quality based on physicochemical tests.

INTRODUCTION

WHY THIS ARCHITECTURE DESIGN DOCUMENT?

Any software needs the architectural design to represent the design of the software. IEEE defines architectural design as “the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system.” The software that is built for computer-based systems can exhibit one of these many architectures.

Each style will describe a system category that consists of:

- A set of components (eg: a database, computational modules) that will perform a function required by the system.
- The set of connectors will help in coordination, communication, and cooperation between the components.
- Conditions that how components can be integrated to form the system.
- Semantic models help the designer to understand the overall properties of the system

SCOPE

Architecture Design Document (ADD) is an architectural design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the design principles may be defined during requirement analysis and then refined during architectural design work.

ARCHITECTURE DESCRIPTION

Power BI is a business analytics service provided by Microsoft that allows users to analyze and visualize data from a wide variety of sources. Power BI architecture consists of several components that work together to provide a robust, scalable, and secure analytics solution.

Here are the key components of Power BI architecture:

Data Sources: Power BI supports a wide range of data sources, including Excel files, cloud-based and on-premises databases, web services, and many others.

Power BI Desktop: This is a Windows application used to create reports and data models. It allows users to connect to data sources, transform data, and create visualizations.

Power BI Service: This is the cloud-based service used to publish and share reports created in Power BI Desktop. It provides a web interface for accessing reports, sharing and collaborating with other users, and managing data sources and security.

Power BI Mobile: This is the mobile app used to access and view reports on mobile devices.

Power BI Gateway: This is a client application that allows Power BI to access on-premises data sources securely. It is installed on a server within the organization's network and acts as a bridge between the Power BI service and the on-premises data sources.

Data Model: This is the structure used to organize and transform data from various sources into a unified format that can be used to create reports and visualizations.

Reports and Dashboards: These are the final outputs of the Power BI solution, created using Power BI Desktop and published to the Power BI service. Reports provide interactive visualizations of data, while dashboards provide a high-level overview of key metrics and trends.

Security: Power BI offers robust security features, including role-based access control, row-level security, and data encryption, to ensure that data is kept secure and confidential.

Overall, the Power BI architecture is designed to be flexible, scalable, and secure, allowing organizations of all sizes to gain valuable insights from their data.

ARCHITECTURE

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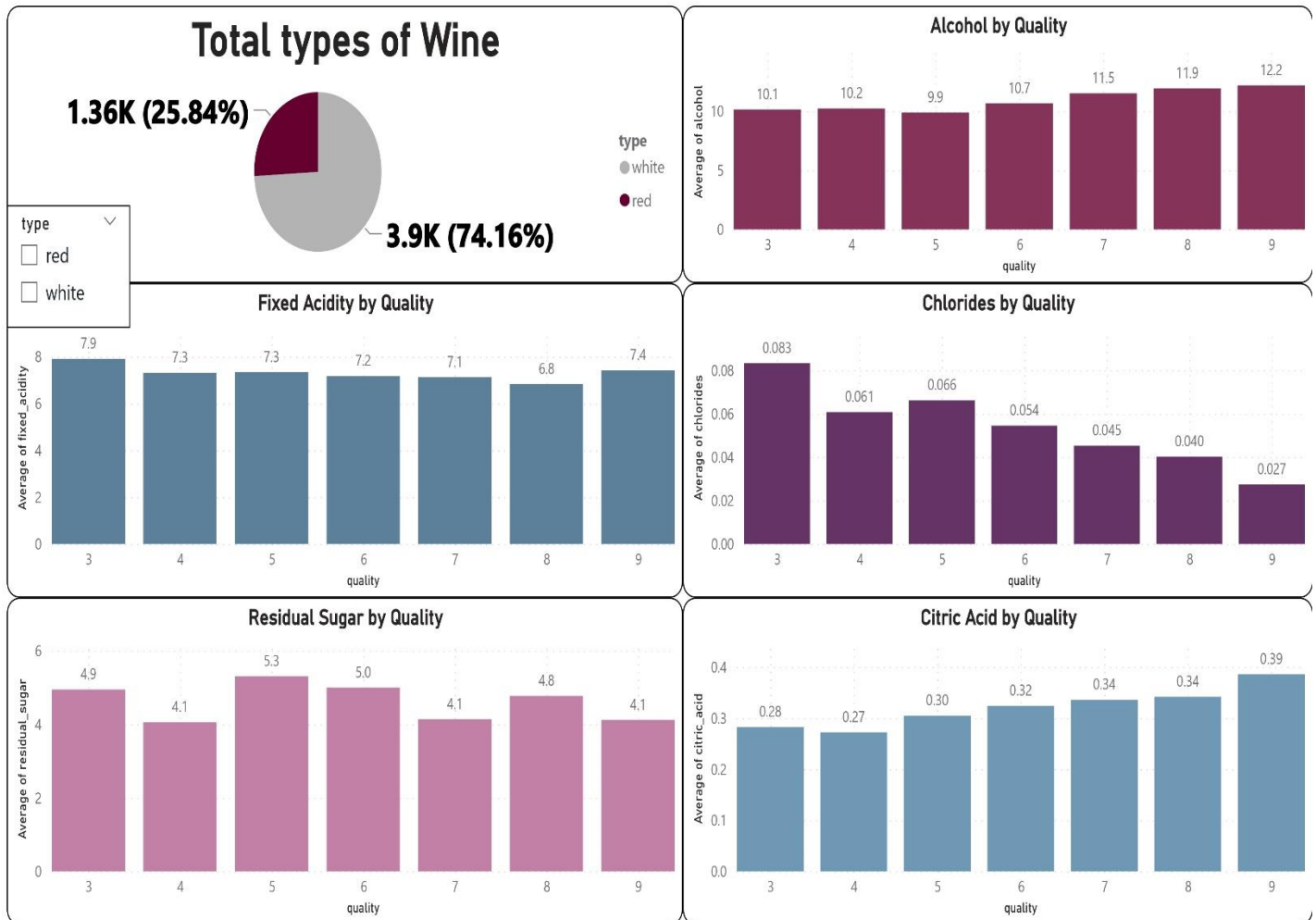
To achieve this goal, we will begin by collecting and pre-processing the dataset that will be used in our analysis. We will use Python data manipulation libraries like Pandas to clean and optimize the data. We will also perform table calculations and data filtering to obtain more granular results.

Next, we will import the cleaned dataset into a Business Intelligence (BI) tool such as Power BI. Using this tool, we will create visualizations and dashboards that will help us to explore the relationships between different attributes and identify key findings. We will also use filters to speed up the process of finding insights and create more granular reports.

In addition to creating visualizations and dashboards, we will also perform feature engineering to extract more useful information from the dataset. This can help us to identify the quality of wine and improve the accuracy of our analysis. We will also build predictive models and validate them to ensure that they are accurate and reliable.

Finally, we will create a detailed project report that includes all the visual plots and key findings from the analysis.

Dashboard:



Predictor:

Wine Quality Prediction Web App

By SHRUTI KHANDELIWAL

Quantity of Fixed Acidity



Quantity of Volatile Acidity



Quantity of Citric Acid



Quantity of Residual Sugar



Quantity of Chlorides



Quantity of Free Sulfur Dioxide



Quantity of Total Sulfur Dioxide



Quantity of Free Sulfur Dioxide

0.00



0.00

100.00

Quantity of Total Sulfur Dioxide

0.00



0.00

200.00

Density

0.00



0.00

1.00

Value of pH

0.00



0.00

14.00

Quantity of Sulphates

0.00



0.00

10.00

Quantity of alcohol

0.00



0.00

20.00

Wine Quality Results

Wine Quality is Bad