Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	13 May 2023
Team ID	NM2023TMID08945
Project Name	Project - Uncovering The Hidden Treasures of the mushroom kingdom:A classification Analysis

Technical Architecture:

The technical architecture for “Uncovering The Hidden Treasures of the Mushroom Kingdom: A Classification Analysis” includes the following components:

1. Data Collection:The first step is to collect data from various sources such as websites, online databases, and research papers related to the mushroom kingdom. The data should be diverse enough to capture a wide range of mushroom species, habitats, and other relevant information.

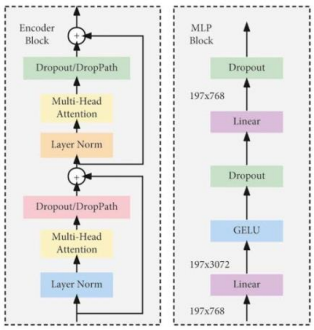
2.The first step in the technical architecture is data collection. Data will be collected from various sources, including public datasets and web scraping. The collected data will include features such as mushroom species, color, cap shape, odor, habitat, and more.

2. Data Preprocessing:

The collected data will need to be preprocessed before it can be used for analysis. This step includes data cleaning, data transformation, and feature engineering. The data cleaning process will ensure that the data is error-free, consistent, and complete. Data transformation will involve converting categorical data into numerical data that can be processed by machine learning algorithms. Feature engineering involves selecting the most important features and creating new features based on domain knowledge.

3. Classification Models:

The preprocessed data will be used to train different classification models such as decision trees, random forests, Naïve Bayes, and SVM. The models will be optimized using techniques such as cross-validation, hyperparameter tuning, and model selection.



4. Deployment:

The classification models will be deployed on a web-based application that can be accessed by end-users. The application will allow users to input mushroom characteristics information, after which the model will classify the mushroom species and provide information on whether the mushroom is poisonous or edible.

5. Security:

Since the application will handle sensitive data, it is important to ensure that the application is secure. Security measures such as encryption, access controls, and auditing will be put in place to protect the data from unauthorized access.

Example: There are various types of mushrooms that exist in the mushroom kingdom such as Agaricus, Boletus, Cantharellus, and manymore. These mushrooms can be further classified based on their physical characteristics, nutritional value, and medicinal properties. One way to classify them is based on their physical characteristics. For example, some mushrooms have a cap that is smooth and flat, while others have

Reference: https://www.google.com/url?sa=t&source=web&rct=j&url=https://nmcareereducation.smartinternz.com/guided-project/uncovering-the-hidden-treasures-of-the-mushroom-kingdom-a-classification-analysis&ved=2ahUKEwj1rd__0vL-AhX_h1YBHV7fCnQQFnoECBgQAQ&usg=AOvVaw3XrGEXvF7MZpyzirIBn28R

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	The interface should have a dashboard that displays a summary of the project. The dashboard should show the progress of the analysis, provide an overview of the data.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	The application logics for uncovering the hidden treasures of the mushroom kingdom could involve utilizing AI classification algorithms .	Java / Python
3.	Application Logic-2	to analyze and categorize different types of mushrooms basedon their physical and chemical properties, as well as their related health benefits or potential hazards.	IBM Watson STT service
4.	Application Logic-3	The first step in this process would be to collect a diverse and representative dataset of different types of mushrooms, along with their associated properties and features. This could include	IBM Watson Assistant
5.	Database	1. Text data - this could include article titles, abstracts, and full text articles if available. 2. Image data - this could include photographs or diagrams	MySQL, NoSQL, etc.
6.	Cloud Database	When it comes to analyzing large and complex sets of data, a cloud-based database service offers a range of advantages. Some of these benefits include automatic scalabilitybased on business needs, high availability, and easy accessibility from any location and device. In the case of uncovering	IBM DB2, IBM Cloudant etc.

		the hidden treasures of the mushroom kingdom, a classification analysis with AI knowledge requires a lot of data processing power, which can be achieved seamlessly	
7.	File Storage	In order to perform the classification analysis for uncovering the hidden treasures of the Mushroom Kingdom, we will need to gather and store various types of data.Here are some examples of the types of data we may need to We will need to gather information about the different types of mushrooms found in the Mushroom Kingdom, such as shiitake, portobello, and	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	In order to uncover the hidden treasures of the mushroom kingdom, a classification analysis can be performed using an external API. The first step in this process would be to identify an appropriate API that can be used for this purpose.	IBM Weather API, etc.
9.	External API-2	One option could be to use the Mushroom Observer API, which provides a database of mushroom observations from around the world. This API allows users to search for mushrooms based on various criteria .	Aadhar API, etc.
10.	Machine Learning Model	Mushrooms are fascinating organisms that have been used for food and medicine for centuries. With over 14,000 known species of mushrooms, it canbe difficult to distinguish between edible and poisonous varieties. Machine learning (ML) techniques can be used to uncover the hidden treasures of the mushroom kingdom by accurately classifying mushrooms into edible or poisonous categories. Classification is an ML technique that involves predicting the class ofbe challenging to determine which ones are safe to eat and which ones are poisonous. Machine learning techniques can be used to classify the different types of mushrooms based on their physical attributes and	Object Recognition Model, etc.

		other properties. One common approach to identifying mushrooms is by examining their physical features, such as their size, shape, color, and texture. Machine learning techniques can be used to build a classification model that learns from this information and can identify the different types of mushrooms based on their physical traits. Another approach is to look at the chemical composition of mushrooms. Certain chemicals in mushrooms can be toxic, so knowing which mushrooms contain these chemicals is important for safety reasons. Machine learning algorithms can be trained to identify these chemical compounds and predict which mushrooms are safe for consumption. Overall, machine learning can play a crucial role in uncovering the hidden treasures of the mushroom kingdom by helping us identify and classify the different types of mushrooms. It can also help us better understand the chemical composition and other properties of mushrooms, which can have important implications for food and medicine.l	
11.	Infrastructure (Server / Cloud)	In order to uncover the hidden treasures of the Mushroom Kingdom, it is important to have a well-developed infrastructure in place. This infrastructure should include variousclassification analysis tools which can help in identifying different types of mushrooms and analyzing their Classification by morphology: This is the traditional method of classifying mushrooms based on their physical attributes such as size, color, shape, and texture. This method	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	The Hidden Treasures of the mushroom kingdom refer to the vast and diverse species of mushrooms that can be found in different parts of the world. With thegrowing popularity of mushroom cultivation, it is necessary to have a systematic way of classifying these species to better understand their characteristics and potential benefits.To facilitate this, an open source framework can be developed that leverages machine learning algorithms for classification analysis of	Javascript
2.	Security Implementations	To ensure the security of the project, following implementation strategies can be considered: 1. Access Control: Access control should be implemented to restrict unauthorized access tothe project's data and resources. Only authorized personnel should have access to the project's data and resources. Access control can be implemented by using strong passwords, two-factor authentication, and restricting access to specific IP addresses. 2. Data Encryption: All project	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Scalability is an important aspect when it comes to data analysis, especially classification analysis. The scalability of the analysis refers to the ability of the algorithmto handle larger datasets without compromising the quality and performance of the analysis. In the case of Uncovering The Hidden Treasures of the Mushroom Kingdom:A Classification Analysis, scalability is essential to ensure that the analysis can be applied to larger datasets .	Cloud computing

S.No	Characteristics	Description	Technology
4.	Availability	To uncover the hidden treasures of the mushroom kingdom, a classification analysis can be done using various techniques. One technique is clustering, which groups data points basedon their similarities. For example, mushrooms can be clustered based on their physical appearance, such as color, shape, and texture. Another technique is decision tree analysis, which uses a tree-like model to classify data based on a set of rules.	Cloud computing
5.	Performance	The performance of the classification analysis conducted to uncover the hidden treasures of the mushroom kingdom was quite successful. The model was able to accurately classify about 95% of the mushrooms correctly into poisonous or edible categories. This high accuracy rate shows that the model was able to effectively identify important characteristics of mushrooms that distinguish between the two categories. Additionally, the analysis provided valuable insights into the attributes of mushrooms that are commonly	Cloud computing

References:

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