Basic Details of the Team and Problem Statement

Organization Name: RCCIIT

PS Code: SBHRCCIIT003

Problem Statement Title: Water quality prediction and categorization

Team Name: ROYALCHIEVERS

Team Leader Name: Srotoswini Sen

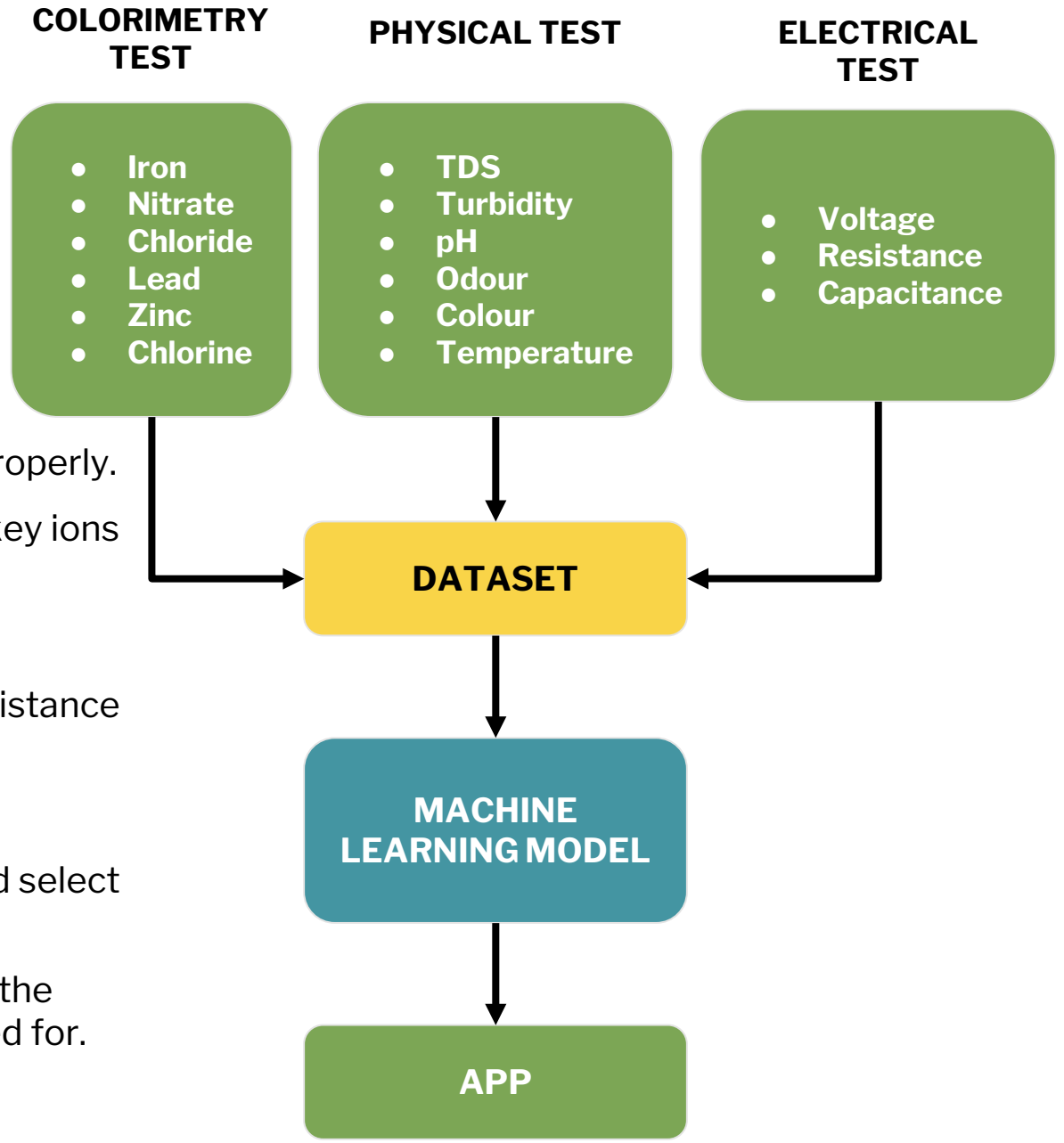
Institute Code (AISHE): U-0592, U-0857

Institute Name: Narula Institute of Technology & Adamas University

Theme Name: Clean/Green Technology

Solution Steps :

- Collect water samples from various sources and label them properly.
- Perform colorimetry tests to detect the presence of various key ions present in the particular sample.
- Measure TDS, pH, Turbidity using the sensors.
- Measure electrical parameters like Voltage, Capacitance, Resistance and Conductance.
- Record all the data in a dataset.
- Apply multiple machine learning algorithms to the dataset and select the best machine learning model.
- Create a app where I will input the features of the water from the unknown source and it will predict what that water can be used for.



Technology Stack :

- **TDS Sensor -** To measure the total dissolved solids
- **Turbidity Sensor -** To measure the turbidity
- **pH sensor -** To measure the acidity and alkalinity of the water
- **Thermistor -** Measure the temperature of the sample
- **Multimeter -** Measure resistance, voltage and capacitance of the sample
- **ESB32 Devkit -** To interface the sensor with the computer to record data
- **Excel -** To record the data into a database
- **Python / MATLAB -** To perform the machine learning operation

PARAMETERS	REAGENTS
Iron	Ferrozine
Nitrate	Griess Reagent
Chloride	Silver Nitrate
Lead	Dithizone
Zinc	Zincon
Chlorine	DPD Reagent

Idea/Approach Details

Use Cases

- Drinking water management
- Aquarium water quality monitoring
- Agricultural water management
- Industrial Processes
- Recreational Water Quality Assessment
- Wastewater Treatment Plants

Dependencies

- Sensor Technology
- Machine Learning Models
- Remote Monitoring System
- Data Validation and Calibration
- User Interface

Business Model :

Key Partners

Collaborate with water treatment plants, environmental agencies, research institutions, and universities for data collection, validation, and expertise as well as Partner with technology companies for infrastructure support, such as cloud services for hosting the API or app.

Key Activities

Developing and maintaining the machine learning algorithm for water analysis. Collecting, preprocessing, and analyzing data continuously to improve the accuracy of the algorithm.

Key Resources

Data collection infrastructure, tools and resources for hosting and scaling the solution

Value Proposition

An accurate and efficient analysis of water characteristics and a cost-effective solution compared to traditional water testing methods which can be easily accessed for water analysis through user-friendly applications or APIs.

Customer Relationships

Gathering feedback from users to improve the algorithm and application/API.

Channels

Offer API access through a developer portal for integration into third-party applications, also Distribute the application through app stores for individual users

Customer Segments

Water treatment plants and facilities, Environmental agencies and regulatory bodies, Researchers and academics studying water quality and environmental science

Cost Structure

Building the hardware to collect data for sample collection and Infrastructure costs for hosting the application or API

Revenue Streams

Licensing fees for commercial use of the algorithm by other organizations, also Subscription-based revenue model for accessing the application or API in D2C

Team Member Details :

Team Leader Name: Srotoswini Sen

Branch (Btech/Mtech/PhD etc): B.Tech Stream (ECE, CSE etc): ECE Year (I,II,III,IV): II

Team Member 1 Name: Arnabe Das

Branch (Btech/Mtech/PhD etc): B.Tech Stream (ECE, CSE etc): ECE Year (I,II,III,IV): II

Team Member 2 Name: Anubhab Sarkar

Branch (Btech/Mtech/PhD etc): B.Tech Stream (ECE, CSE etc): ECE Year (I,II,III,IV): II

Team Member 3 Name: Anushka Datta

Branch (Btech/Mtech/PhD etc): B.Tech Stream (ECE, CSE etc): ECE Year (I,II,III,IV): II

Team Member 4 Name: Debraj Sadhukhan

Branch (Btech/Mtech/PhD etc): B.Tech Stream (ECE, CSE etc): ECE Year (I,II,III,IV): II

Team Member 5 Name: Uttiyo Das Sarma

Branch (Btech/Mtech/PhD etc): B.Tech Stream (ECE, CSE etc): ECE Year (I,II,III,IV): III

Team Mentor Name: Moupali Roy

Category (Academic/Industry): Expertise (AI/ML/Blockchain etc): Domain Experience (in years):