Phase 2: INNOVATION

Project Title: WATER QUALITY ANALYSIS

Anomaly Detection for Water Quality

Phase 2 of this project, which involves exploring anomaly detection techniques for water quality analysis and it can be approached as follows:

DATA COLLECTION AND PREPROCESSING:

Continue collecting relevant water quality data from various sources, including sensors,and monitoring stations or historical records.

Clean and preprocessing the data to ensure consistency and reliability. This may involve handling of missing values, outliers and data quality issues.

Feature Selection:

Identify the most critical water quality parameters that are essential for assessing potability and detecting anomalies**.**

Exploratory Data Analysis (EDA):

Perform EDA to gain insights into the data. Visualize the distributions of the selected parameters and look for patterns or trends.

Anomaly Detection Techniques:

Considering various implementation of anomaly detection methods such as,

Statistical Methods: Utilizing statistical measures like z-scores or percentiles to identify outliers.

Machine Learning Models: Train supervised or unsupervised models, such as Isolation Forest, One-Class SVM, or autoencoders may be used for detecting anamolies.

Model Evaluation:

Evaluate the performance of the anomaly detection models using appropriate metrics like precision, recall, and F1-score.

Fine-tune the models and choosing one that best suits for the data and project objectives.

Visualization:

Creating visualizations to represent detected anomalies, helping stakeholders understand the patterns and their potential impact on water quality.

Alerting System:

Implementing some of the alerting system that can notify relevant personnel when significant anomalies are detected. This could be based on thresholds or automated triggers.

Documentation and Reporting:

Document your findings, the methodology used, and the results. Generate regular reports for stakeholders and regulatory bodies.

Continuous Monitoring:

Establish a process for continuous monitoring of water quality data to ensure that anomalies are detected in real-time.

FLOWCHART: