1. **Acea Smart Water Analysis**
2. **Overview**

This project is focused to help Petrignano water plant of Acea Group, preserve precious waterbodies. Acea is the foremost Italian operator in the water services sector supplying 9 million inhabitants in Lazio, Tuscany, Campania. The Acea Group deals with four different type of water bodies: water spring, lake, river, and aquifers.

1. **What is the business problem?**

To handle daily consumption, Petrignano water Plant need to forecast the underground(aquifers) water level and water flow, for each year.

1. **Stakeholder: -** Petrignano plant of Acea Group

To preserve underground water and maintain continuous supply; It is important to predict the efficient water availability and its consumption.

1. **Datasets: -**

Although the dataset contains multiple water bodies, we will only be looking at the Aquifer\_Petrignano.csv file.

[https://www.kaggle.com/c/acea-water-prediction/data/](https://www.kaggle.com/c/acea-water-prediction/data/%20)

CSV file: - Aquifer\_Petrignano.csv

1. **Data science approach**

I shall be using ARIMA, Auto-ARIMA and ADF model for Time Series analysis and LSTM recurrent neural network to model our business problem.

1. **How solution addresses the original business problem: -**

Model shall help Petrignano water plant; in suggesting best recommendation from its prediction of Under Ground water level depth. With advance prediction, it helps the plant manage its supply.

1. **2015 Flight delay and cancellation**
2. **Overview**

In 2015 there are lots of flight delays in United States for some reason. Nearly one third of all flights in data set have delays. The main reasons for flight delays are weather related but, in some cases, there are also airline or airport related flight delays. This document examines and shows the delay and cancellation causes in several aspects.

1. **What is the business problem?**

As Airline Company, a frequent Flyer, or a Travel Company; need to evaluate various aspect of Flight delay and cancellation.

# What factors contributes the most to flight delay?

# Which month has the most delay in 2015?

# Which state in America has the most flight cancellation?

# What are the conditions that led to the cancellation in Airports?

1. **Stakeholder:** A frequent Flyer or a Travel Company

Flight delays or cancellation may increase ticket costs to customers and operational costs to airlines. Apart from outcomes directly related to passengers, delay prediction is crucial during the decision-making process for every player in the air transportation system.

1. **Dataset:**

<https://www.kaggle.com/usdot/flight-delays>

Datasets consist of 3 csv file.

airlines.csv, airports.csv, flights.csv

1. **Data science approach**

Shall be using supervised regression using Convocation neural network and tensor flow.

1. **How solution addresses the original business problem**

Solution to this problem will help gain below insight.

1. By evaluating cause for delay, we can minimize future delay or cancellation.

# Customer or Airline can know the trend on which month can have more delays or cancel flights.

# Predicting state with most flight cancellation; Airline can add surcharge or customer an avoid flying to those state.

# Knowing the conditions such as bad whether for cancellation at specific airport; can help customer avoid travel during such condition.

**3. Natural Image Processing (CIFAR-10 Photo Classification)**

1. **What is the business problem?**

New Image classification problem:- For any given image at a zoo; Classify to any of it’s10 possibilities with respect to given dataset. (Cifar-10 in this case).. Once Image classification model is built same process can be used to train and replace any new Image classification problem.

1. **Stakeholders:** A third party (Zoo) looking for Image classification requirement**.**

A zoo needs to know image captured for objects in its premises belongs to which of the given 10 categories.

1. **Dataset**

Link: <https://www.cs.toronto.edu/~kriz/cifar.html>

[CIFAR-10 python version](https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz)

1. **Data science approaches**

Convolutional neural network (CNN) with filter and max pooling

1. **How solution addresses the original business problem**

Solution to this problem correctly classifies any new given image. This in turn helps zookeeper know image of an animal or object belongs to which category.