

# HIGH LEVEL DOCUMENT

## Concrete Compressive Strength Prediction

Domain: Infra

Rajesh Gottoju

# Contents

## Abstract

1. Introduction.....	1
Why this High-Level Design Documentation.....	1
Scope .....	2
2. General Description .....	2
Production Perspective.....	2
Problem Statement .....	2
Proposed Solution .....	3
Further Improvements .....	3
Data Requirements .....	3
Tools Used .....	4
Constraints.....	4
Assumptions.....	4
3. Design Details .....	5
Process Flow.....	5
Model Training and Evaluation.....	6
Deployment Process.....	6
Event log.....	6
Event Handling.....	6
4. Performance .....	7
Reusability.....	7
Deployment.....	7
5. Conclusion.....	8

## Abstract

The quality of concrete is determined by its compressive strength, which is measured using a conventional crushing test on a concrete cylinder. The strength of the concrete is also a vital aspect in achieving the requisite longevity. It will take 28 days to test strength, which is a long period. So, what will we do now? We can save a lot of time and effort by using Data Science to estimate how much quantity of which raw material we need for acceptable compressive strength.

## 1.Introduction

## Why these high-level Documentation

The purpose of High-level Documentation is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior coding, and can be used as reference manual for how the modules interact at a high level.

### The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like:
  - o Security o Reliability
  - o Maintainability
  - o Portability
  - o Reusability
  - o Application compatibility
  - o Resource utilization
  - o Serviceability

## Scope

This software system will be a web application, this system will be designed to predict the Strength of the Concrete on user's input.

## 2.General Description

## Product Prescriptive

This Concrete Compressive Strength Prediction is a Machine Learning model which will predict Strength of Concrete.

## Problem Statement

The quality of concrete is determined by its compressive strength, which is measured using a conventional crushing test on a concrete cylinder. The strength of the concrete is also a vital aspect in achieving the requisite longevity. It will take 28 days to test strength, which is a long period. So, what will we do now? We can save a lot of time and effort by using Data Science to estimate how much quantity of which raw material we need for acceptable compressive strength.

## Proposed Solution

This system requires like feature provided by the system like Cement, Blast furnace slag, fly ash, water ,Coarse aggregate etc.

## Further Improvements

AS the data is not very huge our main is to complete this use case with deep learning algorithm as a best optimized solution, In future if we are expected to get more data and different categories, if needed we might use deep learning algorithm to get best solution.

## Data Requirements

Data requirements completely depend on our problem statement.

## Tools Used

- Python
- Stream lit

- Pandas

## Constraints

This project is based on Infra domain, this system can get excepted results.

## Assumptions

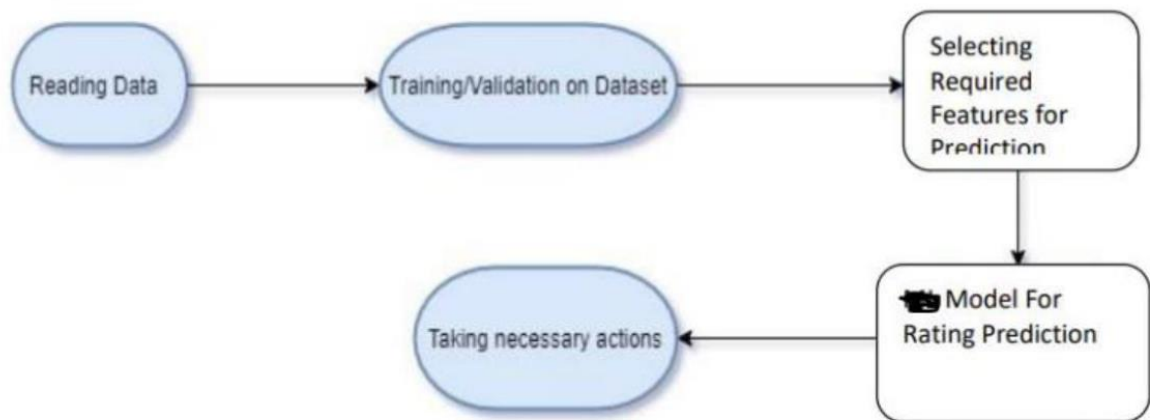
The main objective of the project is to implement the use case as previously mentioned (2.2 problem statement). This system will help us to predict the Strength of cement.

## 3.Design Details

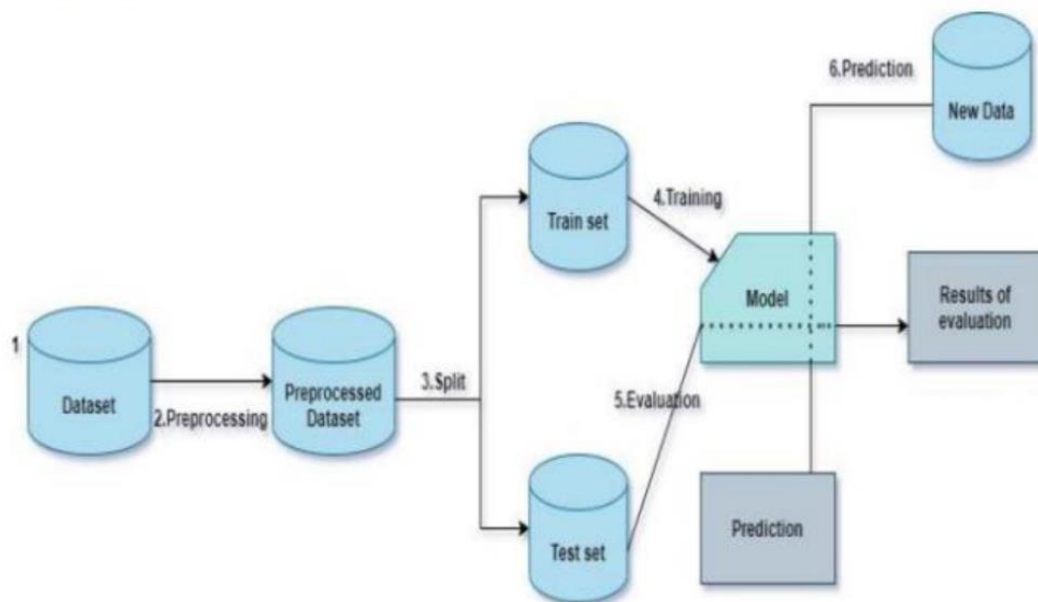
### Process Flow

Based on the use-case, we will use a machine learning base model. Below the Process flow .

## Proposed Methodology

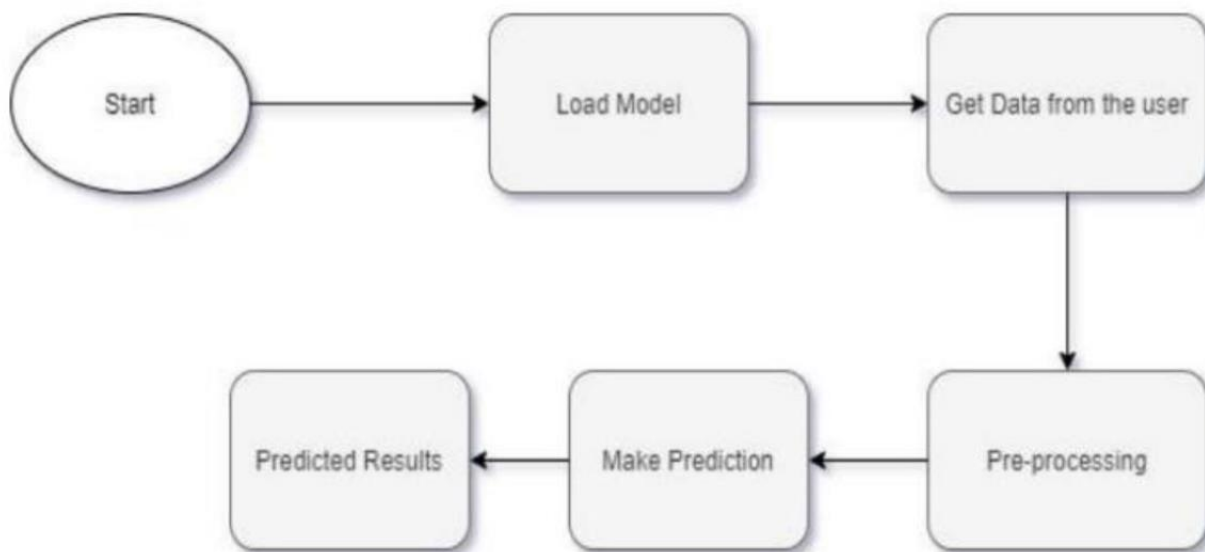


## Model Training and Evaluation





## Deployment Process



## Event Log

The system should log every event so that the user will know what process is running internally.

### Initial Step-step description:

- The system identifies at what step logging required
- The system should be able to log each and every system flow.
- Developer can choose logging method. We chose File logging.
- System should not hang as we have used file logging. Logging just because we can easily debug issues so logging is mandatory to do.

## 4 Performance

### Reusability

The code written and the components used has the ability to be reused with no problems if there is similar problem statement.

### Application Compatibility

The different components for this project will be using Python as an interface between them. Each component will have its own task to perform, and it is the job of the Python to ensure proper transfer of information.

### Resource Utilization

When any task is performed, it will likely use all the processing power available until that function is finished.

## Deployment

- Stream lit

## Conclusion

This system predicts the Compressive Strength of the Concrete.