**Predicting Concrete Strength with Neural Networks**

Concrete is a unique building material that has high compressive strength and relatively low tensile strength. A concrete mix is designed by engineers that specialize in creating a "recipe" to ensure certain material properties, one of which is the design strength.

The production of concrete starts by mixing the dry ingredients and then adding water to start a chemical reaction that causes it to cure. As concrete cures its strength increases. This is a non-linear development of strength whereby the concrete quickly develops strength and after this initial period, strength development slows down but still continues long after the hardened concrete goes into service.

Engineers consider the 28 day compressive strength of concrete as the design strength. This is the strength used to design buildings, bridges, and roadways for example. This project looks at a dataset of 1030 samples of concrete. These samples were mixed, aged, and cast as test cylinders that were then crushed to determine the breaking strength of the sample. For each cylinder, the dataset includes the mix ingredient amounts, age of the cylinder, and the breaking strength.

This project seeks to predict the 28 day breaking strength of the samples based on the mix and age of the sample.