**Abstract**

Concrete is the safest and sustainable construction material which is most widely used in the world as it provides superior fire resistance, gains strength over time and gives an extremely long service life. Its annual consumption is estimated between 21 and 31 billion tones. Designing a concrete mix involves the process of selecting suitable ingredients of concrete and determining their relative amounts with the objective of producing a concrete of the required, strength, durability, and workability as economically as possible. According to the National Council for Cement and Building Materials (NCBM), New Delhi, the compressive strength of concrete is governed generally, by the water-cement ratio. The mineral admixtures like fly ash, ground granulated blast furnace, silica fume and fine aggregates also influence it. The main purpose of this paper is to predict the compressive strength of the high performance concrete by using classification algorithms like Multilayer Perceptron, M5P Tree models and Linear Regression. The result from this study suggests that tree based models perform remarkably well in predicting the compressive strength of the concrete mix.