COMPUTATIONAL TOOLS FOR TRANSPORTATIONENGINEERING

3-0-2-0-11

Overview of different computational tools and applications in transportation engineering, Integrated Developing Environment (IDE) in R/Python, different data types and dataframes in R/Python and their applications in transportation engineering (vehicle counts, mode choices, etc.), Different looping techniques, operators, regular expressions, user-defined functions in R/Python, Basics of structured data processing in R/Python and applications in transportation engineering such as time-series data processing, Unstructured data processing fundamentals including images and geo-spatial data, data visualization techniques and applications such as GPS traces, crash locations visualizations, Basics of linear modeling, assumptions, and applications in transportation such as crash rates modelling, etc. Introduction to MATLAB, matrices and operators, Combining and transforming matrices, Arithmetic operations in matrix, Introduction to functions, Function I/O, Built-in functions, Introduction to object-oriented programming, Class, Subclass, Objects, Methods and attributes and their properties, Encapsulation, Inheritance and polymorphism, Data structures (structure array, cell array, linked list, trees, etc.), Algorithmic complexity, Error handling.