**Project Title:** A tool for teaching graph algorithms

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**Abstract.**

The goal of this project is to create a program which will assist with teaching graph algorithms such as those taught in "CE204 Data Structures and Algorithms" module. It allows the user to select 1 of 5 available algorithms (Prim's, Kruskal's, Dijkstra's, BFS, DFS), and observe a step-by-step execution of the selected algorithm and key data used by it. It offers multiple pre-defined graphs selectable by the user as well as graph creating/editing facilities. The graphical display of algorithms implementation is provided at different levels of abstraction, using graph coloring and various sub-windows aiming to make algorithms' working principle as intuitive as possible, such windows include:

- step title/description window

- python-based pseudocode window

- edge/vertex collection windows (e.g. priority queue, stack)

- key data window (“V table”)

When learning new concepts, working through practical examples “by hand on paper” is invaluable. While it can be easily done for algebraic equations, it isn’t as straightforward when learning about graph algorithms. Using this tool solves that problem, it makes graph creation quick and convenient, it improves learning experience by near-optimal representation of algorithm states and helps to consolidate understanding by using custom graphs.