1. Let $G = (V, E)$ be a directed, weighted graph. Show that Dijkstra’s algorithm does not work if there are negative weight edges but no negative weight cycles. Make your counterexample as simple as possible.

2. (a) Show how to modify Dijkstra’s algorithm to solve the single source shortest path problem if there is exactly one negative weight edge but no negative weight cycles.
   (b) Justify the correctness of your algorithm.
   (c) How efficient is your algorithm? You should be able to answer this briefly without much detail.