

1. In class we did Dijkstra's algorithm with bounded weights, bound C , with buckets of size $1, 1, 2, 2^2, 2^3, \dots, 2^{\log_2 C}$. What goes wrong with the proof if we use weights $1, 1, 3, 3^2, 3^3, \dots, 3^{\log_3 C}$.
2. In class we did Dijkstra's algorithm with bounded weights, bound C , with buckets of size $1, 1, 2, 2^2, 2^3, \dots, 2^{\log_2 C}$. What is the maximum real number ϵ such that the proof works with weights $1, \lfloor (2 + \epsilon)^0 \rfloor, \lfloor (2 + \epsilon)^1 \rfloor, \lfloor (2 + \epsilon)^2 \rfloor, \lfloor (2 + \epsilon)^3 \rfloor, \dots, \lfloor (2 + \epsilon)^{\log_2 + \epsilon C} \rfloor$ for any value of C .