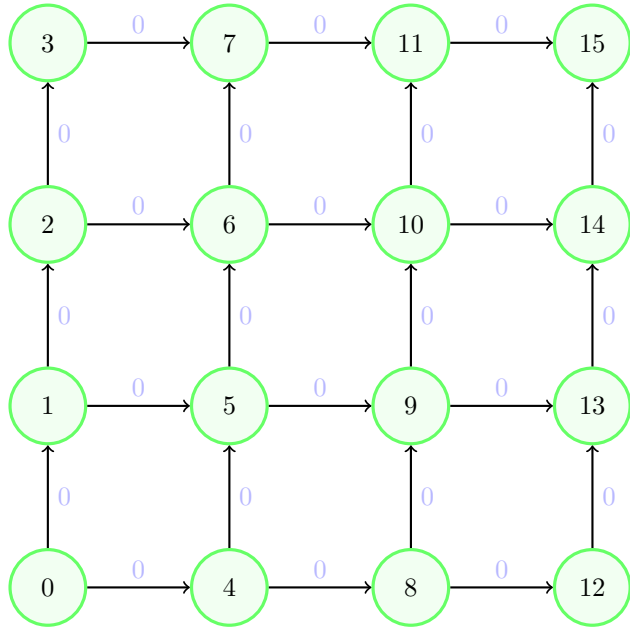
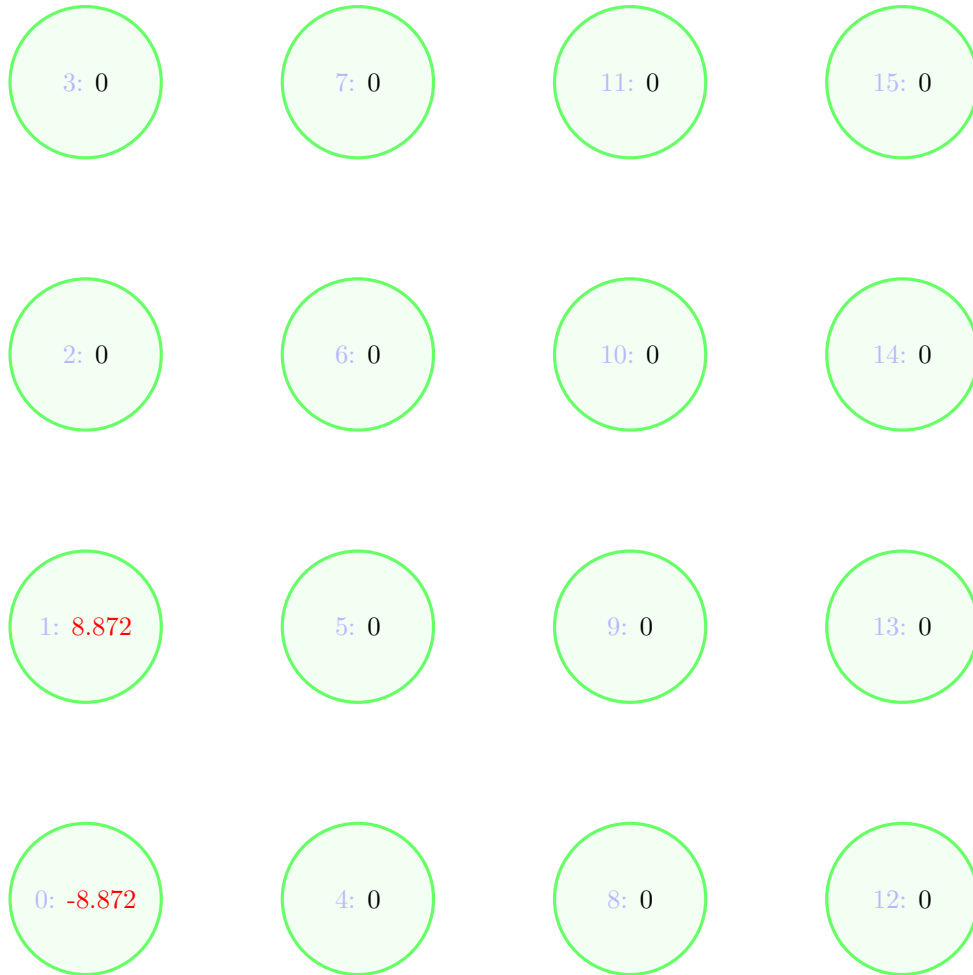


1 Gradient Calculation

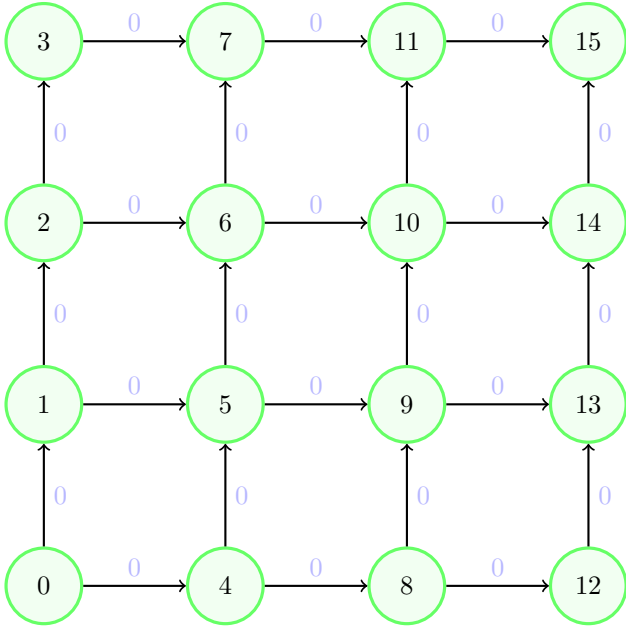
1.1 Given Flow



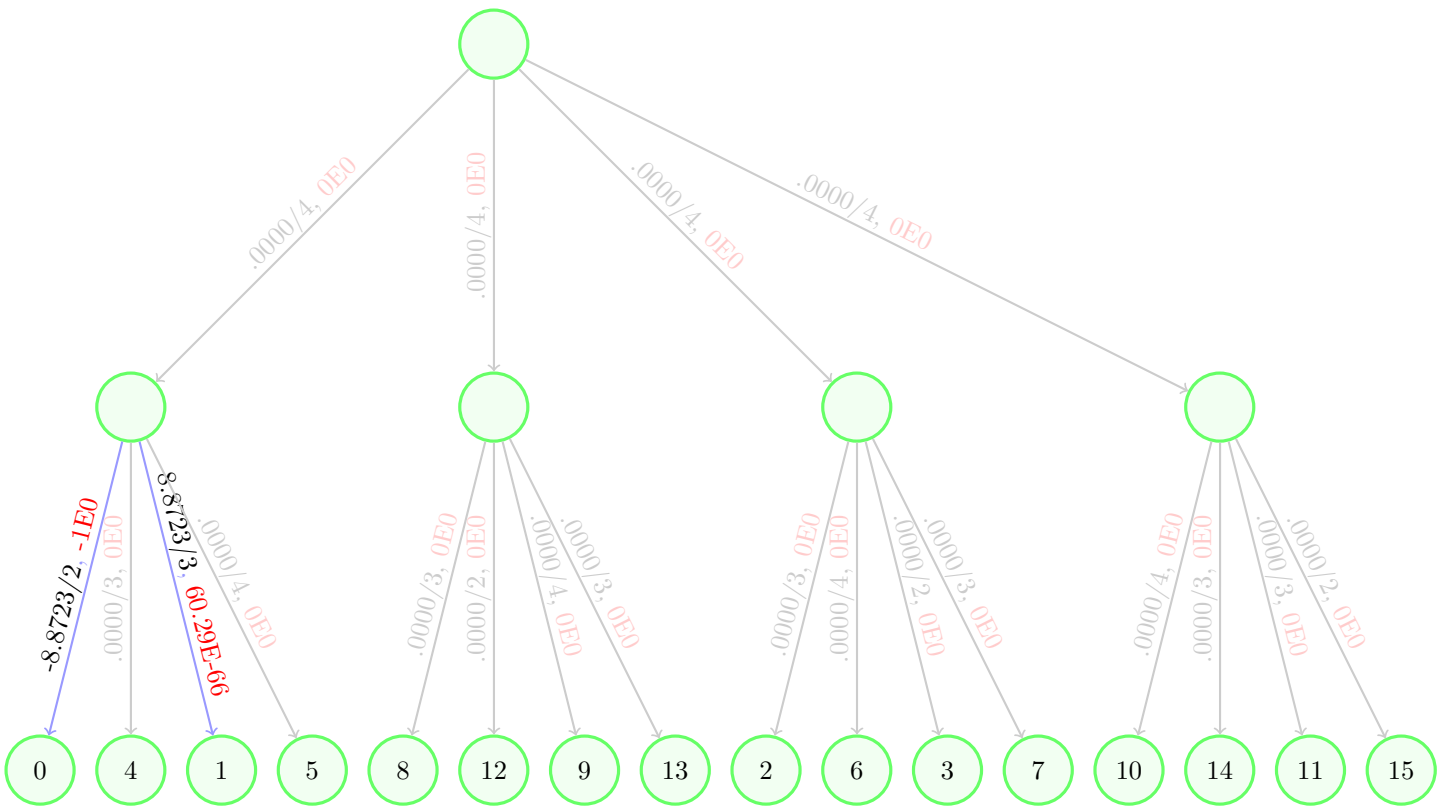
1.2 Given Demand



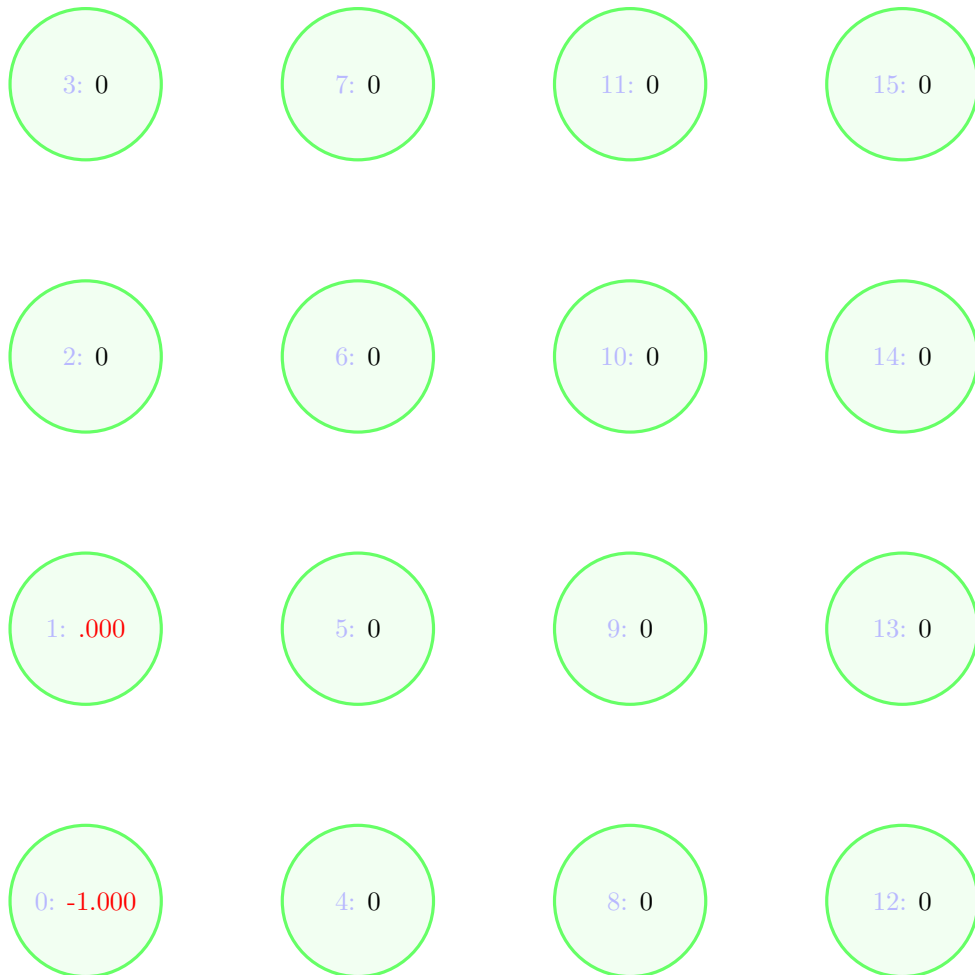
1.3 Gradient (Graph)



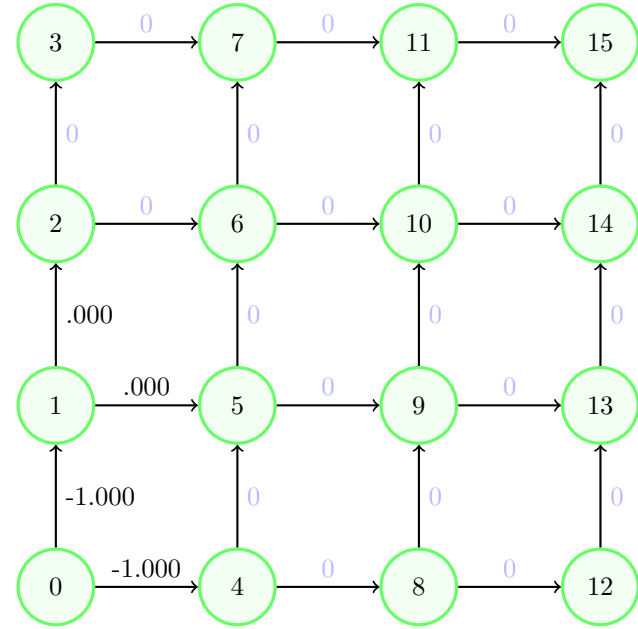
1.4 Current Tree



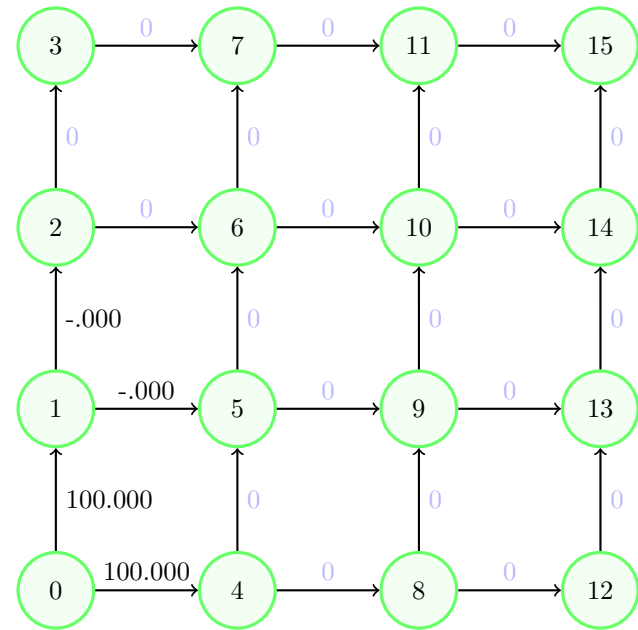
1.5 $R^T \cdot \nabla l_{\max}$



1.6 $B^T \cdot R^T \cdot \nabla \text{lmax}$



1.7 $-2\alpha \cdot \frac{1}{\sum_i e^{(2\alpha \cdot R(b-Bf))_i} + e^{(-2\alpha \cdot R(b-Bf))_i}} \cdot B^T \cdot R^T \cdot \nabla \text{lmax}$



1.8 Total Gradient

