HW1-Deep learning with Graphs

Marzieh

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P1

Since the constant β shows the magnitude to have an easier case, consider $\beta = 1$. To skip divergency, $I - \alpha A$ should not goes to zero because $I - \alpha A \Rightarrow 0$ and $(I - \alpha A)^{-1} \Rightarrow \infty$. It happens when $1 - \alpha a_1 = 0$ where a_1 is the largest value of A because the matrix's treatment depends on the largest eigenvalue. So, $1 - \alpha a_1 > 0$ and it means that $\alpha < 1/a_1$.

P2

At the adjacency matrix A, we have $d_i = \sum_j A_{ij}$ and $d_j = \sum_i A_{ij}$ then in the row of i and j we can see how many connection exist between two noods it can be by $A_i.A_j$ or ij-th entry of the A^2 it means that $[A^2]_{ij}$.