BRADLEY UNIVERSITY
Electrical and Computer Engineering
ECE443/543 — HW3

Problem 1: Consider the following directed graph

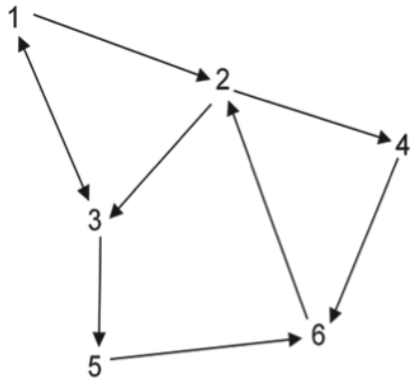

Figure 1: A Directed Graph

- Find Adjacency matrix $\mathcal{A}$, degree matrix $\mathcal{D}$, and Laplacian matrix $\mathcal{L}$.
- For $\mathcal{L}$, find the left eigenvector and right eigenvector corresponding to zero eigenvalue.
- For $\mathcal{L}$, find the rest of eigenvectors and eigenvalues.

Problem 2: Consider the following graphs

- Compute eigenvalues for each graph Laplacian
- Plot those eigenvalues in the complex plane.

Problem 3: Use an example to show the spanning tree in a graph.

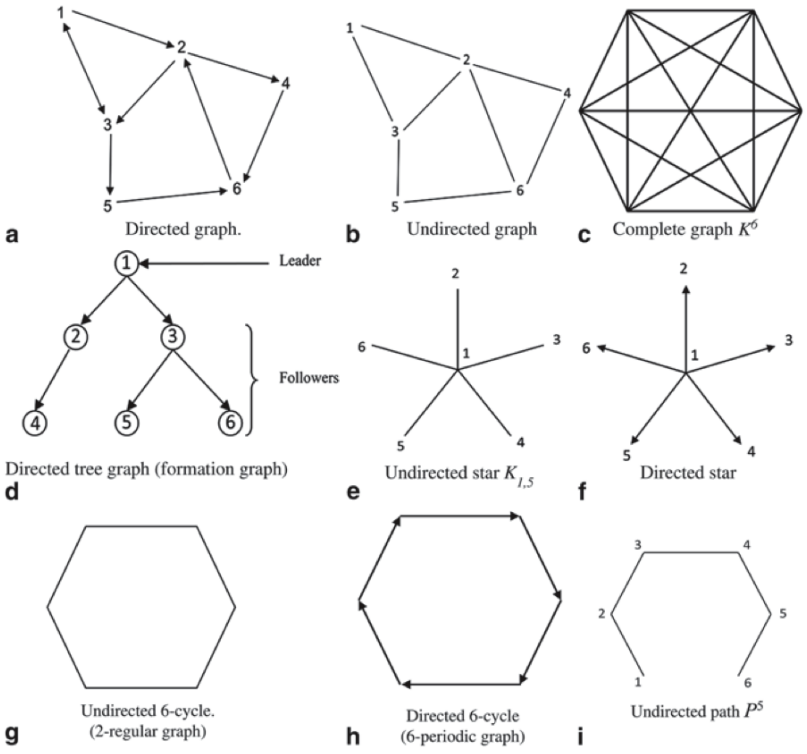

Figure 2: Different Graph Topologies