Lecture Introduction to Network Science
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BIONETS

Assignment 7 – Evolving networks

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Question 1

Answer the following questions:

a) In which ways do evolving and temporal networks differ?

b) How are node degrees distributed in Barabasi-Albert graphs?

c) How can one empirically measure if a network has emerged via prefential attachment?

d) How do node degree distributions of Erdös-Renyi graphs and networks emerging from the Barabasi-Albert model differ?

Question 2

Consider the network presented in Figure 1. Assuming that a new node enters the network, what are the probabilities of the node connecting to existing node $n \in \{A, B, C, D\}$ under

a) the uniform attachment model?

b) the copying model (with $p = 0.5$)?

c) the edge selection model?

d) the Barabasi-Albert model?

Question 3

Use `networkx` to generate random Barabasi-Albert graphs on different input parameters n, m and analyze how the node degree distributions change. Compare your plots with degree distributions of Erdös-Renyi graphs with the same number of nodes and edges.

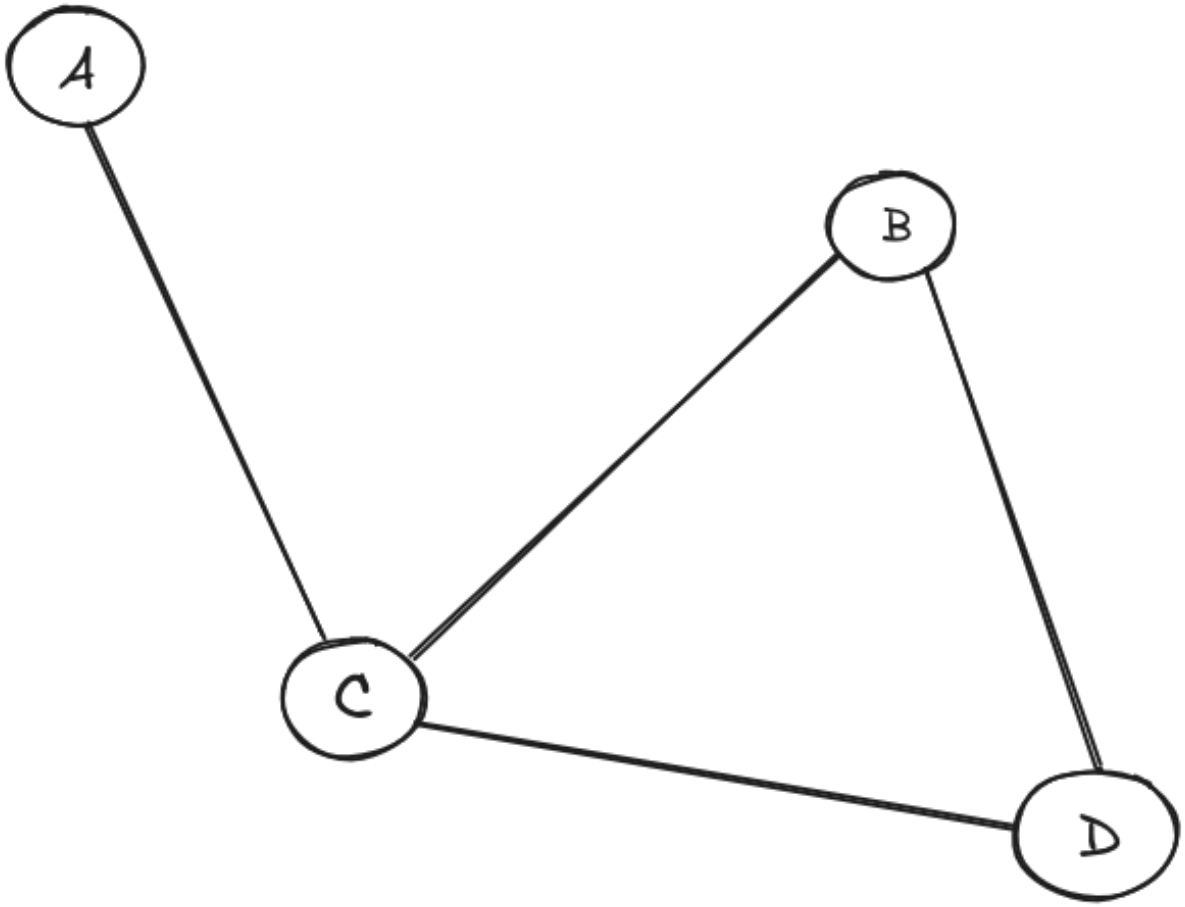

Figure 1: Example network.