Who's the Big Cheese in the University Clubs?

You're new at a university and want to understand social dynamics of students. Here's the club membership information:

| Club	Members
Drama Club	Sarah, Mike, Emma
Art Club	Emma, Alex
Volunteer Club	Alex, Olivia, James
Sailing Club	Alex, Sophia
Chess Club	Sophia, Ethan, Ava, Noah
Debate Team	Noah, Lily
Math Club	Noah, Lucas
Tennis Club	Noah, Henry

Question 1: Draw a network where students are nodes and edges connect students in the same club.

Question 2: Without doing any calculations, which student would you approach first if you wanted to spread information quickly about a new inter-club event? Explain your reasoning.

Question 3: Without doing any calculations, which student would you recommend to be the "Club Coordinator" to help communication between different clubs? Explain your reasoning.

Question 3: How might this network change if a new Robotics Club is formed, and Noan and Emma join it? How would this affect your answers to the previous questions?

Question 4: Let's consider the following network:
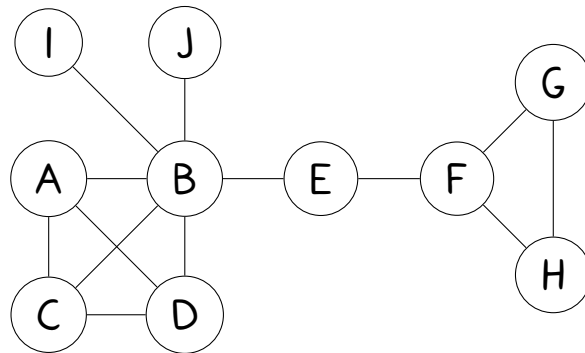
Which node has the highest degree (most connections)?

Question 5:

Nodes B, E, and F are likely the most central, being closest to all other nodes. Fill in the following table the distance from nodes B, E, and F to all nodes, and find the one with the shortest average distance.

	A	B	C	D	E	F	G	H	I	J	AVG
B											
E											
F											

Question 6: Another way to think of centrality is based on how many shortest paths pass through a node. For example, F appears in 14 shortest paths: from G and H (2 nodes) to A-E, I, and J (7 nodes). Count the number of shortest paths that pass through nodes B and E. Which node is the most central by this measure?

Question 7: Going back to the school club network, which student would you approach first if you wanted to spread information quickly about a new inter-club event?

Question 8: Which student would you recommend to be the "Club Co-ordinator" to help communication between different clubs?

Question 9: How would the network change if a new Robotics Club is formed, and Noan and Emma join it? How would this affect your answers to the previous questions?