Suppose that a weighted voting system has five voters (players): $\{P_1, P_2, P_3, P_4, P_5\}$.

Assume $P_1$ has 5 votes, $P_2$ has 4 votes, $P_3$ has 3 votes, and $P_4$ and $P_5$ each have 2 votes. The quota is 10.

In other words, the system can be described as

$$[10 : 5, 4, 3, 2, 2]$$

1. How many ways are there to list all five of these players?
2. Who is pivotal in the ordering $\{P_3, P_5, P_1, P_4, P_2\}$?
3. Who is pivotal in the ordering $\{P_2, P_1, P_3, P_4, P_5\}$?
4. Find an ordering in which $P_5$ is pivotal.

Suppose a weighted voting system has 3 players. $P_1$ has 20 votes, $P_2$ has 15 votes, and $P_1$ has 8 votes, and the quota is 23.

That is, the voting system can be described as

$$[23 : 20, 15, 8]$$

Figure out how much power each player has, according to the Shapley-Shubik index (that is, calculate the Shapley-Shubik index of each player.)