This exercise is based on the paper[1] on sorting posets with seven linear extensions.

1. List the members of your group below. Underline your name.

2. Provide methods to comparison-sort n elements using the fewest comparisons, for $n = 4, 5, 6$. Justify your answers.

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[1]Satoshi Hanamura and Shigeki Iwata, "Posets with seven linear extensions sortable by three comparisons," *Information Processing Letters* 111/8 (2011).

3. Provide an illustrative example of a poset from a practical application. Prove that the relation you describe is a poset. How many linear extensions does this poset have? Depict its Hasse diagram.

4. Prove or disprove: If v is the unique maximum element of a poset P then $e(P - v) = e(P)$, where $P - v$ is the poset P with element v removed.

5. Depict Hasse diagrams of the posets $P_1[k]$ and $P_2[k]$, for $k = 1, 2, 3$, as defined by the paper.