Homework 2: PS/EC 173

1. Show that the simple majority rule does not qualify for an Arrow social welfare function even in the case of two voters and three alternatives.

2. Show that in the case of three alternatives and four voters, all having strict individual orderings, there never occurs a preference cycle under the simple majority rule. Does this also hold for three alternatives and five voters?

3. Show that the following profile can be arranged in a single-peaked way:

\[
\begin{align*}
wp_1yp_1zp_1x \\
z_p_2xz_p_2yz_p_2w \\
y_p_3z_p_3xp_3w
\end{align*}
\]

4. Show that for the following profile of four alternatives, all triples can be arranged in a single-peaked way but that the quadruple cannot be arranged in a single-peaked fashion:

\[
\begin{align*}
y_p_1zp_1x_p_1w \\
x_p_2yz_p_2zp_2w \\
w_p_3yp_3z_p_3x
\end{align*}
\]