1. Prove that a lattice \( L \) is semimodular if and only if, for all \( a \) and \( b \in L \), if \( a \land b \) is covered by \( a \), then \( b \) is covered by \( a \lor b \).

2. Let \( M(S) \) be matroid, and let \( L(S) \) be its lattice of flats. Show that \( L(S) \) is geometric, that is, show that \( L(S) \) is atomic and semi-modular.