Theorem: In any party of six people there are at least three of them that are mutual strangers or three of them that are mutual acquaintance.

Proof: Consider a complete graph with six vertices K_6 where the edges can be colored red or blue. Choose any vertex P. By the pidgeonhole principle, at least three edges touching vertex P will have the same color. Suppose the color is red. Let A, B, C be vertices connected to P with a red edge. Observe that if any of the three edges AB, BC, CA is red, then a red triangle is formed. However, if none of the three edges are red, then all of them are blue, which makes a blue triangle. So, in either case, a triangle is formed which indicates that there is either three mutual strangers or three mutual acquaintances, as desired.

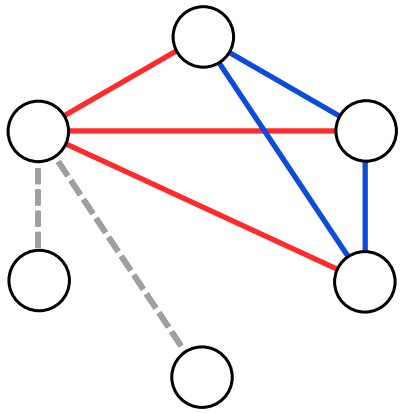

Figure 1: All three edges blue