Proof: $\boxed{\text{Proof:}}$ • Suppose we have the set of persons $P = \{P_i \mid 1 \leq i \leq 6\}$.

• We assume that the relation "Knows" is symmetric, i.e. $\forall i, j, 1 \leq i, j \leq 6$, $i \neq j$

P_i Knows P_j iff P_j Knows P_i.

• Let, $\forall i, 1 \leq i \leq 6$, person P_i has the set of ~~friends~~ $\in P$ Known persons in F_i.

• There are two possible cases:

(1) There exists $P_x \in P$, s.t. $x \in N$, $1 \leq x \leq 6$ and $|F_x| \geq 2$.

• Suppose we arbitrarily pick $p, q, r \in F_x$ and each of them being unique.

suppose p is P_j, q is P_K and r is P_L, $\boxed{1 \leq j, K, L \leq 6}$. The assumption is valid since F_x can only be a subset of P.

• If ($P_K \in F_j$ and $P_j \in F_K$) or ($P_K \in F_L$ and $P_L \in F_K$) or ($P_j \in F_L$ and $P_L \in F_j$) then (p, q, P_x), (q, r, P_x), (p, r, P_x) respectively forms a set of three people where everyone Knows each other.

• Else, if none of the above is true, (p, q, r) forms a triple where none Knows each other.

(2) $\forall i, 1 \leq i \leq 6$, $i \in N$, $|F_i| \leq 2$.

• Suppose, we have $P_x \in P$, $1 \leq x \leq 6$, s.t. $|F_x| > 0$. If no such P_x exist, then we can take any 3 element subset of P; since none of them Knows each other mutually.

• So, we claim P_x exist.

• Let $|F_x| = 1$, and let $P_y \in F_x$, where $1 \leq y \leq 6$, $x \neq y$. Suppose, $\{P_z, P_w, P_u, P_v\}$ represent the set of people whom P_x doesn't Know, $1 \leq z, w, u, v \leq 6$. Suppose, we pick P_z. $\because |F_z| \leq 2$, there exists atleast one person in the set $\{P_w, P_u, P_v\}$ whom P_z doesn't Know. Wlog, let it be P_u. (By pigeonhole principle)

$\therefore \{P_x, P_z, P_u\}$ form a triple where none Know each other.