

### Question 1) Friendship problem

General case: Isolated group of  $n$  people

- Every person has different number of friends.

Possible no. of friends of any person:  $0, 1, \dots, n-1$

$\therefore$  Total possibilities:  $n$

$\therefore$  Each possibility is assigned to each unique person.

$\therefore$  1 possible combination:

Person 1: 0 friends

Person 2: 1 friend

$\vdots$

Person  $n$ :  $n-1$  friends

$\therefore$  Person  $n$  has friendship with everyone and due to symmetry everyone has friendship with person  $n$ .

But person 1 has 0 friends. So due to contradiction, the given claim is not possible.