

# Big O Problem Session problems

October 5, 2015

**1**

In a group of  $n \geq 2$  people, show there are two people with an equal number of friends in the group.

**2**

Given 9 lattice points in a 3d space, show that there is some pair of points with line segment connecting them containing another lattice point.

**3**

Given  $n + 1$  integers in  $[1, 2n]$  show that 2 of them have gcd 1.

**4**

A collection of islands are connected by bridges. Two people travel to the most islands possible. You can get to every island from any island (indirectly). Must there be an island they both visited?