

Problems ♠–1

Due in DSC 235 by 12 noon, Friday, January 19, 2018

Problem A: A graph has 2018 vertices. Given any four vertices, there is at least one joined to the other three. What is the smallest number of vertices which are joined to all other 2017 vertices?

Problem B: A graph has $n > 2$ vertices. Show that we can find two vertices A and B such that at least $\lfloor n/2 \rfloor - 1$ of the remaining vertices are connected to either both or neither of A and B .

[For a real number x , $\lfloor x \rfloor$ is the greatest integer that is less than or equal to x .]

RULES:

- The competition is open to all *undergraduate* UNO students.
- Please submit your solutions to Andrzej Roslanowski in DSC 235 or to his mailbox. (Needless to say, they should be written clearly and legibly.)
- The winners will be determined each semester based on the number of correct solutions submitted.
- Problems will be posted by Friday 5pm and the solutions are due by the following Friday 12 noon.

PRIZES:

- Will be announced later.