Problem ♣–11

Due in DSC 222 by 12 noon, **Friday, November 02**, *2018*

Problem: Show that for any odd positive integer we can always divide the set $\{n, n+1, n+2, \ldots, n+32\}$ into two parts, one with 14 numbers and one with 19, so that the numbers in each part can be arranged in a circle, with each number relatively prime to its two neighbours. [For example, for $n = 1$, arranging the numbers as $1, 2, 3, \ldots, 14$ and $15, 16, 17, \ldots, 33$, does not work, because 15 and 33 are not relatively prime.]

RULES:

- The competition is open to all *undergraduate* UNO students and it is supervised by *Upper Curriculum Committee* of the Mathematics Department.
- Submit your solutions to Andrzej Rosłanowski in DSC 222 or to his mailbox.
- Every nontrivial step/claim in your solution must justified. You may cite/quote a result from your textbook, past problems of the week and other widely available sources. In each case you have to give full reference.
- There are no partial credits, so rather err on the side of caution and provide more explanations than less. If you are not sure that your sources/references are appropriate, please include the complete relevant proofs from there.
- Your answers should be be written clearly and legibly. We reserve the right to refuse grading your work if it is difficult to read it.
- The winners of Fall 2018 edition of POW will be determined at the end of the 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:

- Winners will receive books published by the American Mathematical Society. The titles actually awarded will be selected in cooperation with the awardees.
- Everybody scoring in the POW Competition qualifies for the grand finale: $\frac{\pi}{2}$ *Mathematical Competition.*