Spring 2018/MA 434 HW 14: Bits and pieces

1. Reading:

(1) Read Chapter 4. If you are not one of the presenters below, you may skim the parts assigned for presentations.

2. Homework:

(1) Problems 3 and 8 from Chapter 6.

Remark: Problem 8a shows that the group is "residually finite". This is an important property which a given group may or may not have. It shows up a lot for groups connected with topological spaces.

(2) (From Prof. Taback) Write down three nontrivial elements of L_2, listing each as a lamplighter picture, as a matrix, and as an element of the Diestel-Lieder graph. Please be sure you have at least 4 bulbs illuminated.

(3) (From Prof. Taback) Prove that $Sym_n \cong A_n \rtimes \mathbb{Z}_2$. Be sure to say what the map is from $\mathbb{Z}_2$ to $Aut(A_n)$. For practice, write out three products in $A_n \rtimes \mathbb{Z}_2$ (without using the identity element!) and find the answer using the multiplication rule for semi-direct products. Then multiply the corresponding elements of Sym_n and verify you get the same answer.

(4) For Tuesday, Brian should be prepared to present the definition, and examples of, discrete and proper actions, the definition of $BS(1,2)$, the outline of the proof of Proposition 4.1, and the proof of one part of the outline.