18.701 Problem Set 7

This assignment is due Wednesday November 2

1. Chapter 6, Exercise M.4. (hypercube)

2. Chapter 7, Exercise 5.12. (class equations of $S_6$ and $A_6$)

3. Determine the Class Equation of the group $G = GL_3(\mathbb{F}_2)$ of invertible $3 \times 3$ matrices with entries modulo 2.

You will need to determine the order of $G$ and then compute a few centralizers. I suggest basing your analysis on the possible characteristic polynomials. Begin by finding a nice matrix for each characteristic polynomial. Think ahead to minimize computation.

*Hint:* If $A$ is an element of $G$, the centralizers of $A$ and $I + A$ will be equal. This will be true even though $I + A$ needn’t be invertible.