EXERCISE 6 IN INTRODUCTION TO REPRESENTATION THEORY

DMITRY GOUREVITCH

(1) Let X be a G-set and $\mathcal{F}$ be a sheaf on X. The following structures on $\mathcal{F}$ are equivalent:
   (a) An equivariant structure
   (b) For any $x \in X$ and $g \in G$ - a linear map $\pi(g)_x : \mathcal{F}_x \to \mathcal{F}_{gx}$ such that for $g_1, g_2 \in G$, $\pi(g_1 g_2)_x = \pi(g_1) \circ \pi(g_2)_x$.

(2) (P) Let $H \subset G$ be a subgroup, and $\pi \in Rep(H)$. Define an isomorphism $\mathcal{I}nd(\pi)(G/H) \cong Ind_H^G(\pi)$.

(3) (P) Let the group $G = S_3$ act on itself by conjugation. Describe all the equivariant sheaves on $X = S_3$ under this action. Hint: say that every such sheaf is a direct sum of irreducibles, and describe the irreducible ones.

URL: http://www.wisdom.weizmann.ac.il/~dimagur/IntRepTheo5.html

Date: December 14, 2021.