

HW 2

Group theory

- ① Please go through the supplemental Material, and prove the theorem orthogonality ~~condition~~ relation on page 7.
- ② Please go through the Supplemental Material, and prove the orthogonality relations of characters on page 10.
- ③ Construct the character table for a general D_{2n} group.
- ④ Consider a system with $2n$ hydrogen atoms placed at the vertices of a regular $2n$ -polygon. Denote the atomic orbital at each position as $|1\rangle, |2\rangle, \dots, |2n\rangle$. Find the molecular orbitals by performing decompositions of the $2n$ -dimensional Rep into the irreducible ones.