Braid groups

- **Braid group on n-strands B_n:**

  - positive generators: $\{\sigma_1, \ldots \sigma_{n-1}\}$

  - $\sigma_i \sigma_{i+1} \sigma_i = \sigma_{i+1} \sigma_i \sigma_{i+1}$

  - $\sigma_j \sigma_i = \sigma_i \sigma_j, \, |i - j| \geq 2$

$$123\bar{3}2\bar{1}4 \in B_5$$

Topological braids

- 1D Submanifold M of $D^2 \times I$ with boundary, having n components, so that projection $\pi_I \colon M \to I$ is a covering map.

- Braid group describes isotopy classes.

- σ_i is crossing of ith strand underneath (i+1)th strand.