Exercises:

1. Prove that a homeomorphism E^n onto itself maps each boundary point of E^n to a boundary point.
2. Determine the homology groups of the Klein's bottle.
3. Determine the homology groups of the double torus.
4. Establish the isomorphism $H_0(U \cap V) \longrightarrow H_0(U) \oplus H_0(V)$ in the proof of theorem (35.4)
5. Let C_k be the disjoint union of k copies of S^1 in $\mathbb{R}^3$. Determine the homology groups of the complement $\mathbb{R}^3 - C_k$.
6. Determine the homology groups of $\mathbb{R}P^3$. Try computing the homology groups of $\mathbb{R}P^4$.
7. Determine the homology groups of $S^n \vee S^m$. Use exercise 4 of lecture 25. to calculate the homology groups of $S^2 \times S^4$.