HOMEWORK 2 DUE JANUARY 27TH BY 5PM

Please remember to write down your name and your Stanford ID number (9 digits). All pages refer to Hatcher's book. You may use any results in the book up to and including section 1.2.

1. (6 marks) Construct a path connected space X such that $\pi_1(X, x_0) \cong D_4$, the dihedral group with 8 elements.

2. (8 marks) Exercise 6, page 53. (Ignore the second part about the discrete subspace of $\mathbb{R}^n$)

3. (12 marks) Exercise 9, page 53.

4. (10 marks) Exercise 14, page 54.

5. (12 marks) Exercise 15, page 54. Rephrased: Given any space X, there is a 2-dimensional CW-complex equipped with a map to X that induces an isomorphism in the fundamental group. This is stronger than Corollary 1.28.

6. (10 marks) Exercise 21, page 55. Assume also that Y is locally path-connected.