VUB-Leeds Algebra School, June 2026

Exercises

Exercise 1. Show that (S, M) has finitely many arcs if and only if S is a disk with at most one puncture.
How many arcs are there in these cases?

Exercise 2. Let (S, M) be a disk with c marked points on the boundary and $p \in \{0, 1, 2\}$. How many arcs are there in a triangulation of (S, M)?

Exercise 3. Work out the exchange graph $E(S, M)$ for (S, M) an annulus with one point on each boundary.

Exercise 4. Determine all (S, M) of rank ≤ 3.

Exercise 5. Work out $E(S, M)$ and $E^{\bowtie}(S, M)$ for (S, M) a triangle with one puncture. Work out $E(S, M)$ for (S, M) a hexagon. Compare these three.

Exercise 6. Work out the (extended) Dynkin types for (S, M) of rank ≤ 3 (not all of these are of (extended) Dynkin type).

Exercise 7. Consider Q_T for triangulation of annulus with one point on each boundary. Do one mutation (at $i = 1$ or at $i = 2$). What is $\mu_i(Q_T)$?
Do the same for Q_T where T is a triangulation of once punctured torus.

Exercise 8. Determine the snake graph $\mathcal{G}_\gamma$ for the arc γ from the triangulated annulus in Figure 1.

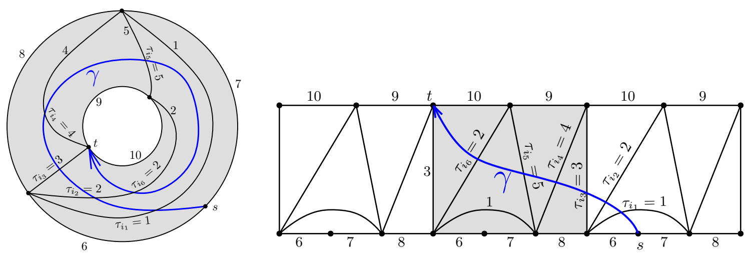

Figure 1. An arc γ in a triangulated annulus and drawn in a covering.

Exercise 9. Show that every snake graph has exactly two perfect matching consisting only of boundary edges.