Fatgraphs of $M_{0,3}$

Automatically generated by FatGHoL 5.4
(See: `http://fatghol.googlecode.com/`)

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There are a total of 3 undecorated fatgraphs in the Kontsevich graph complex of $M_{0,3}$, originating 7 marked ones.

Contents

Notation

We denote $G_{m,j}$ the j-th graph in the set of undecorated fatgraphs with m edges; the symbol $G^{(k)}_{m,j}$ denotes the k-th inequivalent marking of $G_{m,j}$.

Fatgraph vertices are marked with lowercase latin letters "a", "b", "c", etc.; edges are marked with an arabic numeral starting from "1"; boundary cycles are denoted by lowercase greek letters "α", "β", etc.

Automorphisms are specified by their action on the set of vertices, edges, and boundary cycles: for each automorphism A_k, a table line lists how it permutes vertices, edges and boundary cycles relative to the identity morphism A_0. The automorphism table is printed only if the automorphism group is non-trivial.

Automorphisms that reverse the orientation of the unmarked fatgraph are indicated with a "†" symbol in the automorphism table; those that reverse the orientation of the marked fatgraphs are distinguished with a "‡" sign.

If a fatgraph is orientable, a "Markings" section lists all the inequivalent ways of assigning distinct numbers $\{0, \dots, n-1\}$ to the boundary cycles; this is of course a set of representatives for the orbits of $\mathfrak{S}_n$ under the action of $\mathrm{Aut}(G)$.

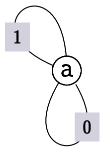
A separate section lists the differential of marked fatgraphs; graphs with null differential are omitted. If no marked fatgraph has a non-zero differential, the entire section is dropped.

Boundary cycles are specified using a "sequence of corners" notation: each corner is represented as ${}^{p}L^{q}$ where L is a latin letter indicating a vertex, and p, q are the attachment indices of the incoming and outgoing edges, respectively. Attachment indices match the Python representation of the vertex: e.g., if a=`Vertex([0,0,1])`, the two legs of edge 0 have attachment indices 0 and 1, and the boundary cycle enclosed by them is represented by the (single) corner ${}^{0}a^{1}$.

Fatgraphs with 2 edges / 1 vertex

There is 1 unmarked fatgraph in this section, originating 6 marked fatgraphs (3 orientable, and 3 nonorientable).

The Fatgraph $G_{2,0}$ (non-orientable, 3 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 0, 0]),# a
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}a^{0})$$
$$\gamma = ({}^{2}a^{3})$$

Automorphisms

A_0	a	0	1	α	β	γ
A_1 †‡	a	1	0	γ	β	α

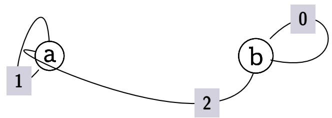
Markings

	$G_{2,0}^{(0)}$	$G_{2,0}^{(1)}$	$G_{2,0}^{(2)}$
α	0	0	1
β	1	2	0
γ	2	1	2

Fatgraphs with 3 edges / 2 vertices

There are 2 unmarked fatgraphs in this section, originating 8 marked fatgraphs (4 orientable, and 4 nonorientable).

The Fatgraph $G_{3,0}$ (non-orientable, 3 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),# a
  Vertex([2, 0, 0]),# b
])
```

Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{2}b^{0} \to {}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{2}a^{0})$$
$$\gamma = ({}^{1}b^{2})$$

Automorphisms

A_0	a	b	0	1	2	α	β	γ
$A_1{}^{\dagger\ddagger}$	b	a	1	0	2	α	γ	β

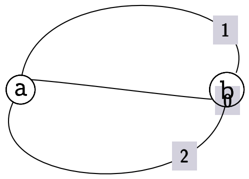
Markings

	$G_{3,0}^{(0)}$	$G_{3,0}^{(1)}$	$G_{3,0}^{(2)}$
α	0	1	2
β	1	0	0
γ	2	2	1

Differentials

$$D(G_{3,0}^{(1)}) = +G_{2,0}^{(0)}$$

The Fatgraph $G_{3,1}$ (non-orientable, 1 orientable marking)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 0, 1]),# b
])
```

Boundary cycles

$$\alpha = ({}^0a^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$

Automorphisms

A_0	a	b	0	1	2	α	β	γ
$A_1{}^{\ddagger}$	a	b	2	0	1	β	γ	α
$A_2{}^{\ddagger}$	a	b	1	2	0	γ	α	β
$A_3{}^{\dagger\ddagger}$	b	a	0	2	1	β	α	γ
$A_4{}^{\dagger\ddagger}$	b	a	1	0	2	α	γ	β
$A_5{}^{\dagger\ddagger}$	b	a	2	1	0	γ	β	α

Markings

	$G_{3,1}^{(0)}$
α	0
β	1
γ	2

Differentials

$$D(G_{3,1}^{(0)}) = +G_{2,0}^{(0)}$$