Fatgraphs of $M_{0,5}$

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

2012-02-09

There are a total of 290 undecorated fatgraphs in the Kontsevich graph complex of $M_{0,5}$, originating 31262 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 $\{0, \ldots, n-1\}$ to the boundary cycles; this is of course a set of representatives for the orbits of $\mathfrak{S}_n$ under the action of $\mathrm{Aut}(G)$.

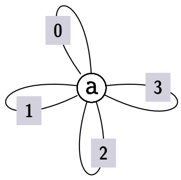
A separate section lists the differential of marked fatgraphs; graphs with null differential are omitted. If no marked fatgraph has a non-zero differential, the entire section is dropped.

Boundary cycles are specified using a "sequence of corners" notation: each corner is represented as ${}^pL^q$ 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 ${}^0a^1$.

Fatgraphs with 4 edges / 1 vertex

There are 3 unmarked fatgraphs in this section, originating 420 marked fatgraphs (210 orientable, and 210 nonorientable).

The Fatgraph $G_{4,0}$ (non-orientable, 30 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 1, 2, 2, 3, 3]),# a
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{5}a^{6} \to {}^{3}a^{4} \to {}^{7}a^{0})$$
$$\gamma = ({}^{2}a^{3})$$
$$\delta = ({}^{4}a^{5})$$
$$\epsilon = ({}^{6}a^{7})$$

Automorphisms

A_0	a	0	1	2	3	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	1	2	3	0	γ	β	δ	ϵ	α
$A_2{}^{\ddagger}$	a	2	3	0	1	δ	β	ϵ	α	γ
$A_3{}^{\dagger\ddagger}$	a	3	0	1	2	ϵ	β	α	γ	δ

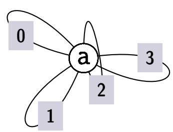
Markings

	$G_{4,0}^{(0)}$	$G_{4,0}^{(1)}$	$G_{4,0}^{(2)}$	$G_{4,0}^{(3)}$	$G_{4,0}^{(4)}$	$G_{4,0}^{(5)}$	$G_{4,0}^{(6)}$	$G_{4,0}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{4,0}^{(8)}$	$G_{4,0}^{(9)}$	$G_{4,0}^{(10)}$	$G_{4,0}^{(11)}$	$G_{4,0}^{(12)}$	$G_{4,0}^{(13)}$	$G_{4,0}^{(14)}$	$G_{4,0}^{(15)}$
α	0	0	0	0	0	0	0	0

(continued.)

β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{4,0}^{(16)}$	$G_{4,0}^{(17)}$	$G_{4,0}^{(18)}$	$G_{4,0}^{(19)}$	$G_{4,0}^{(20)}$	$G_{4,0}^{(21)}$	$G_{4,0}^{(22)}$	$G_{4,0}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{4,0}^{(24)}$	$G_{4,0}^{(25)}$	$G_{4,0}^{(26)}$	$G_{4,0}^{(27)}$	$G_{4,0}^{(28)}$	$G_{4,0}^{(29)}$		
α	1	1	1	1	1	1		
β	0	0	0	0	0	0		
γ	2	2	3	3	4	4		
δ	3	4	2	4	2	3		
ϵ	4	3	4	2	3	2		

The Fatgraph $G_{4,1}$ (120 orientable markings)




```
Fatgraph([
  Vertex([2, 0, 0, 1, 1, 2, 3, 3]),# a
])
```

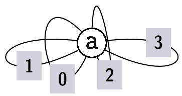
Boundary cycles

$$\alpha = ({}^{2}a^{3} \to {}^{4}a^{5} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2})$$
$$\gamma = ({}^{3}a^{4})$$
$$\delta = ({}^{5}a^{6} \to {}^{7}a^{0})$$
$$\epsilon = ({}^{6}a^{7})$$

Markings

Fatgraph $G_{4,1}$ only has the identity automorphism, so the marked fatgraphs $G_{4,1}^{(0)}$ to $G_{4,1}^{(120)}$ are formed by decorating boundary cycles of $G_{4,1}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{4,2}$ (60 orientable markings)




```
Fatgraph([
  Vertex([2, 0, 1, 1, 0, 2, 3, 3]),# a
])
```

Boundary cycles

$$\alpha = ({}^{4}a^{5} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}a^{4})$$
$$\gamma = ({}^{2}a^{3})$$
$$\delta = ({}^{5}a^{6} \to {}^{7}a^{0})$$
$$\epsilon = ({}^{6}a^{7})$$

Automorphisms

A_0	a	0	1	2	3	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	a	2	3	0	1	α	δ	ϵ	β	γ

Markings

	$G_{4,2}^{(0)}$	$G_{4,2}^{(1)}$	$G_{4,2}^{(2)}$	$G_{4,2}^{(3)}$	$G_{4,2}^{(4)}$	$G_{4,2}^{(5)}$	$G_{4,2}^{(6)}$	$G_{4,2}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{4,2}^{(8)}$	$G_{4,2}^{(9)}$	$G_{4,2}^{(10)}$	$G_{4,2}^{(11)}$	$G_{4,2}^{(12)}$	$G_{4,2}^{(13)}$	$G_{4,2}^{(14)}$	$G_{4,2}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	3	4	1	2	2	2	3	3
δ	4	3	4	4	3	4	2	4
ϵ	1	1	2	1	4	3	4	2
	$G_{4,2}^{(16)}$	$G_{4,2}^{(17)}$	$G_{4,2}^{(18)}$	$G_{4,2}^{(19)}$	$G_{4,2}^{(20)}$	$G_{4,2}^{(21)}$	$G_{4,2}^{(22)}$	$G_{4,2}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	0	0	3	4	0	2

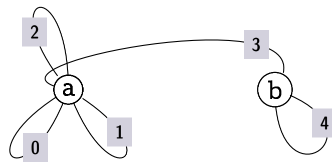
(continued.)

δ	2	3	3	4	4	3	4	4
ϵ	3	2	4	3	0	0	2	0
	$G_{4,2}^{(24)}$	$G_{4,2}^{(25)}$	$G_{4,2}^{(26)}$	$G_{4,2}^{(27)}$	$G_{4,2}^{(28)}$	$G_{4,2}^{(29)}$	$G_{4,2}^{(30)}$	$G_{4,2}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	0	0
δ	3	4	1	4	1	3	3	4
ϵ	4	3	4	1	3	1	4	3
	$G_{4,2}^{(32)}$	$G_{4,2}^{(33)}$	$G_{4,2}^{(34)}$	$G_{4,2}^{(35)}$	$G_{4,2}^{(36)}$	$G_{4,2}^{(37)}$	$G_{4,2}^{(38)}$	$G_{4,2}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	3	4	0	1	1	1	2	2
δ	4	3	4	4	2	4	1	4
ϵ	0	0	1	0	4	2	4	1
	$G_{4,2}^{(40)}$	$G_{4,2}^{(41)}$	$G_{4,2}^{(42)}$	$G_{4,2}^{(43)}$	$G_{4,2}^{(44)}$	$G_{4,2}^{(45)}$	$G_{4,2}^{(46)}$	$G_{4,2}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	0	0	2	4	0	1
δ	1	2	2	4	4	2	4	4
ϵ	2	1	4	2	0	0	1	0
	$G_{4,2}^{(48)}$	$G_{4,2}^{(49)}$	$G_{4,2}^{(50)}$	$G_{4,2}^{(51)}$	$G_{4,2}^{(52)}$	$G_{4,2}^{(53)}$	$G_{4,2}^{(54)}$	$G_{4,2}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	0	0
δ	2	3	1	3	1	2	2	3
ϵ	3	2	3	1	2	1	3	2
	$G_{4,2}^{(56)}$	$G_{4,2}^{(57)}$	$G_{4,2}^{(58)}$	$G_{4,2}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	2	3	0	1				
δ	3	2	3	3				
ϵ	0	0	1	0				

Fatgraphs with 5 edges / 2 vertices

There are 21 unmarked fatgraphs in this section, originating 4224 marked fatgraphs (2112 orientable, and 2112 nonorientable).

The Fatgraph $G_{5,0}$ (120 orientable markings)




```
Fatgraph([
  Vertex([2, 2, 3, 0, 0, 1, 1]),# a
  Vertex([4, 4, 3]),            # b
])
```

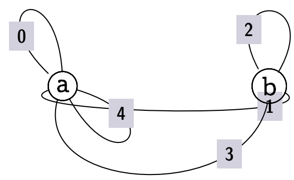
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1}) \\
\beta &= ({}^{4}a^{5} \to {}^{1}a^{2} \to {}^{1}b^{2} \to {}^{2}a^{3} \to {}^{2}b^{0} \to {}^{6}a^{0}) \\
\gamma &= ({}^{3}a^{4}) \\
\delta &= ({}^{5}a^{6}) \\
\epsilon &= ({}^{0}b^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{5,0}$ only has the identity automorphism, so the marked fatgraphs $G_{5,0}^{(0)}$ to $G_{5,0}^{(120)}$ are formed by decorating boundary cycles of $G_{5,0}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,1}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 3, 4, 4]),# a
  Vertex([3, 1, 2, 2]),      # b
])
```

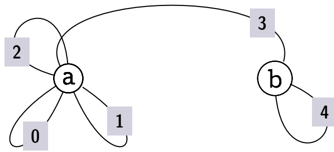
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}b^{0} \to {}^{3}a^{4} \to {}^{5}a^{0} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{2}b^{3})
\end{aligned}
$$

Markings

Fatgraph $G_{5,1}$ only has the identity automorphism, so the marked fatgraphs $G_{5,1}^{(0)}$ to $G_{5,1}^{(120)}$ are formed by decorating boundary cycles of $G_{5,1}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,2}$ (120 orientable markings)




```
Fatgraph([
  Vertex([2, 3, 2, 0, 0, 1, 1]),# a
  Vertex([4, 4, 3]),            # b
])
```

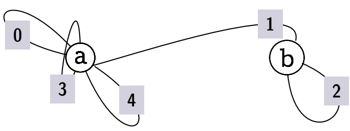
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{1}a^{2} \to {}^{2}b^{0} \to {}^{0}a^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{2}a^{3} \to {}^{4}a^{5} \to {}^{6}a^{0}) \\
\gamma &= ({}^{3}a^{4}) \\
\delta &= ({}^{5}a^{6}) \\
\epsilon &= ({}^{0}b^{1})
\end{aligned}$$

Markings

Fatgraph $G_{5,2}$ only has the identity automorphism, so the marked fatgraphs $G_{5,2}^{(0)}$ to $G_{5,2}^{(120)}$ are formed by decorating boundary cycles of $G_{5,2}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,3}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 0, 1, 3, 4, 4]),# a
  Vertex([2, 2, 1]),            # b
])
```

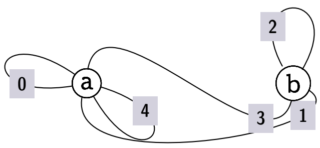
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}a^{3} \to {}^{3}a^{4} \to {}^{2}b^{0} \to {}^{0}a^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2}) \\
\gamma &= ({}^{4}a^{5} \to {}^{6}a^{0}) \\
\delta &= ({}^{5}a^{6}) \\
\epsilon &= ({}^{0}b^{1})
\end{aligned}$$

Markings

Fatgraph $G_{5,3}$ only has the identity automorphism, so the marked fatgraphs $G_{5,3}^{(0)}$ to $G_{5,3}^{(120)}$ are formed by decorating boundary cycles of $G_{5,3}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,4}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 0, 1, 4, 4]),# a
  Vertex([3, 1, 2, 2]),      # b
])
```

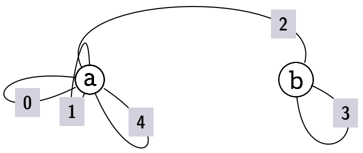
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}a^{3} \to {}^{3}b^{0} \to {}^{0}a^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2}) \\
\gamma &= ({}^{3}a^{4} \to {}^{5}a^{0} \to {}^{0}b^{1}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{2}b^{3})
\end{aligned}$$

Markings

Fatgraph $G_{5,4}$ only has the identity automorphism, so the marked fatgraphs $G_{5,4}^{(0)}$ to $G_{5,4}^{(120)}$ are formed by decorating boundary cycles of $G_{5,4}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,5}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 0, 0, 1, 4, 4]),# a
  Vertex([3, 3, 2]),            # b
])
```

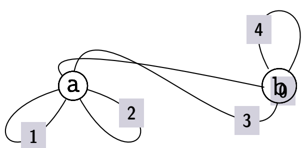
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^3a^4 \to {}^2b^0 \to {}^0a^1 \to {}^1b^2)$$
$$\beta = ({}^2a^3)$$
$$\gamma = ({}^4a^5 \to {}^6a^0)$$
$$\delta = ({}^5a^6)$$
$$\epsilon = ({}^0b^1)$$

Markings

Fatgraph $G_{5,5}$ only has the identity automorphism, so the marked fatgraphs $G_{5,5}^{(0)}$ to $G_{5,5}^{(120)}$ are formed by decorating boundary cycles of $G_{5,5}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,6}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 1, 1, 2, 2]),# a
  Vertex([3, 0, 4, 4]),      # b
])
```

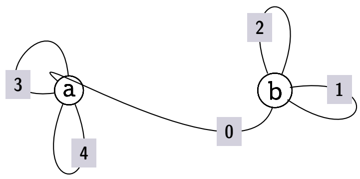
Boundary cycles

$$\alpha = ({}^3b^0 \to {}^0a^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^3a^4 \to {}^5a^0 \to {}^0b^1)$$
$$\gamma = ({}^2a^3)$$
$$\delta = ({}^4a^5)$$
$$\epsilon = ({}^2b^3)$$

Markings

Fatgraph $G_{5,6}$ only has the identity automorphism, so the marked fatgraphs $G_{5,6}^{(0)}$ to $G_{5,6}^{(120)}$ are formed by decorating boundary cycles of $G_{5,6}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,7}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 3, 4, 4]),# a
  Vertex([0, 1, 1, 2, 2]),# b
])
```

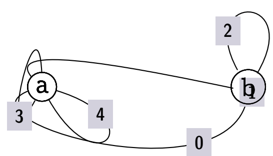
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^1a^2 \to {}^4b^0 \to {}^2b^3 \to {}^0a^1 \to {}^0b^1) \\
\beta &= ({}^2a^3 \to {}^4a^0) \\
\gamma &= ({}^3a^4) \\
\delta &= ({}^1b^2) \\
\epsilon &= ({}^3b^4)
\end{aligned}$$

Markings

Fatgraph $G_{5,7}$ only has the identity automorphism, so the marked fatgraphs $G_{5,7}^{(0)}$ to $G_{5,7}^{(120)}$ are formed by decorating boundary cycles of $G_{5,7}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,8}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0, 3, 4, 4]),# a
  Vertex([0, 1, 2, 2]),      # b
])
```

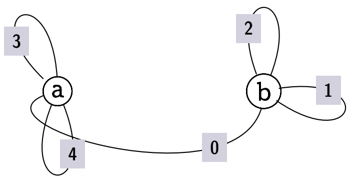
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}a^{3} \to {}^{3}b^{0} \to {}^{0}a^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}b^{1}) \\
\gamma &= ({}^{3}a^{4} \to {}^{5}a^{0}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{2}b^{3})
\end{aligned}$$

Markings

Fatgraph $G_{5,8}$ only has the identity automorphism, so the marked fatgraphs $G_{5,8}^{(0)}$ to $G_{5,8}^{(120)}$ are formed by decorating boundary cycles of $G_{5,8}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,9}$ (60 orientable markings)




```
Fatgraph([
  Vertex([3, 3, 0, 4, 4]),# a
  Vertex([0, 1, 1, 2, 2]),# b
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1}) \\
\beta &= ({}^{4}b^{0} \to {}^{1}a^{2} \to {}^{2}b^{3} \to {}^{2}a^{3} \to {}^{4}a^{0} \to {}^{0}b^{1}) \\
\gamma &= ({}^{3}a^{4}) \\
\delta &= ({}^{1}b^{2}) \\
\epsilon &= ({}^{3}b^{4})
\end{aligned}$$

Automorphisms

A_0	a	b	0	1	2	3	4	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	0	4	3	2	1	ϵ	β	δ	γ	α

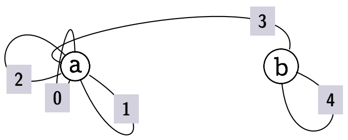
Markings

	$G_{5,9}^{(0)}$	$G_{5,9}^{(1)}$	$G_{5,9}^{(2)}$	$G_{5,9}^{(3)}$	$G_{5,9}^{(4)}$	$G_{5,9}^{(5)}$	$G_{5,9}^{(6)}$	$G_{5,9}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{5,9}^{(8)}$	$G_{5,9}^{(9)}$	$G_{5,9}^{(10)}$	$G_{5,9}^{(11)}$	$G_{5,9}^{(12)}$	$G_{5,9}^{(13)}$	$G_{5,9}^{(14)}$	$G_{5,9}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{5,9}^{(16)}$	$G_{5,9}^{(17)}$	$G_{5,9}^{(18)}$	$G_{5,9}^{(19)}$	$G_{5,9}^{(20)}$	$G_{5,9}^{(21)}$	$G_{5,9}^{(22)}$	$G_{5,9}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{5,9}^{(24)}$	$G_{5,9}^{(25)}$	$G_{5,9}^{(26)}$	$G_{5,9}^{(27)}$	$G_{5,9}^{(28)}$	$G_{5,9}^{(29)}$	$G_{5,9}^{(30)}$	$G_{5,9}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{5,9}^{(32)}$	$G_{5,9}^{(33)}$	$G_{5,9}^{(34)}$	$G_{5,9}^{(35)}$	$G_{5,9}^{(36)}$	$G_{5,9}^{(37)}$	$G_{5,9}^{(38)}$	$G_{5,9}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	0	0	2	4	0	0	2	3
ϵ	4	3	4	2	4	2	3	2
	$G_{5,9}^{(40)}$	$G_{5,9}^{(41)}$	$G_{5,9}^{(42)}$	$G_{5,9}^{(43)}$	$G_{5,9}^{(44)}$	$G_{5,9}^{(45)}$	$G_{5,9}^{(46)}$	$G_{5,9}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	0	0	3	4	1	1	3	4
ϵ	3	2	4	3	4	3	4	3
	$G_{5,9}^{(48)}$	$G_{5,9}^{(49)}$	$G_{5,9}^{(50)}$	$G_{5,9}^{(51)}$	$G_{5,9}^{(52)}$	$G_{5,9}^{(53)}$	$G_{5,9}^{(54)}$	$G_{5,9}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	0	0	1	0	1	0	2	1
ϵ	4	3	4	4	3	3	4	4
	$G_{5,9}^{(56)}$	$G_{5,9}^{(57)}$	$G_{5,9}^{(58)}$	$G_{5,9}^{(59)}$				
α	3	3	3	3				

(continued.)

β	1	1	2	2
γ	0	2	0	1
δ	2	0	1	0
ϵ	4	4	4	4

The Fatgraph $G_{5,10}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 2, 3, 2, 0, 1, 1]),# a
  Vertex([4, 4, 3]),            # b
])
```

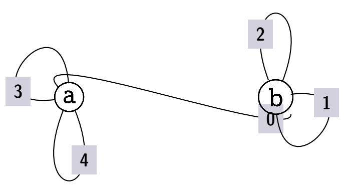
Boundary cycles

$$\alpha = ({}^{3}a^{4} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}a^{3} \to {}^{2}b^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{4}a^{5} \to {}^{6}a^{0})$$
$$\delta = ({}^{5}a^{6})$$
$$\epsilon = ({}^{0}b^{1})$$

Markings

Fatgraph $G_{5,10}$ only has the identity automorphism, so the marked fatgraphs $G_{5,10}^{(0)}$ to $G_{5,10}^{(120)}$ are formed by decorating boundary cycles of $G_{5,10}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,11}$ (60 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 3, 4, 4]),# a
  Vertex([1, 0, 1, 2, 2]),# b
])
```

Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0b^1 \to {}^0a^1 \to {}^1b^2)$$
$$\beta = ({}^2a^3 \to {}^4a^0)$$
$$\gamma = ({}^3a^4)$$
$$\delta = ({}^4b^0 \to {}^2b^3)$$
$$\epsilon = ({}^3b^4)$$

Automorphisms

A_0	a	b	0	1	2	3	4	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	0	3	4	1	2	α	δ	ϵ	β	γ

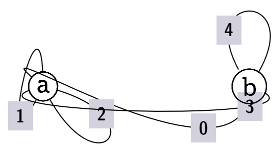
Markings

	$G^{(0)}_{5,11}$	$G^{(1)}_{5,11}$	$G^{(2)}_{5,11}$	$G^{(3)}_{5,11}$	$G^{(4)}_{5,11}$	$G^{(5)}_{5,11}$	$G^{(6)}_{5,11}$	$G^{(7)}_{5,11}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{5,11}$	$G^{(9)}_{5,11}$	$G^{(10)}_{5,11}$	$G^{(11)}_{5,11}$	$G^{(12)}_{5,11}$	$G^{(13)}_{5,11}$	$G^{(14)}_{5,11}$	$G^{(15)}_{5,11}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	3	4	1	2	2	2	3	3
δ	4	3	4	4	3	4	2	4
ϵ	1	1	2	1	4	3	4	2
	$G^{(16)}_{5,11}$	$G^{(17)}_{5,11}$	$G^{(18)}_{5,11}$	$G^{(19)}_{5,11}$	$G^{(20)}_{5,11}$	$G^{(21)}_{5,11}$	$G^{(22)}_{5,11}$	$G^{(23)}_{5,11}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	0	0	3	4	0	2
δ	2	3	3	4	4	3	4	4
ϵ	3	2	4	3	0	0	2	0
	$G^{(24)}_{5,11}$	$G^{(25)}_{5,11}$	$G^{(26)}_{5,11}$	$G^{(27)}_{5,11}$	$G^{(28)}_{5,11}$	$G^{(29)}_{5,11}$	$G^{(30)}_{5,11}$	$G^{(31)}_{5,11}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	0	0
δ	3	4	1	4	1	3	3	4
ϵ	4	3	4	1	3	1	4	3

(continued.)

	$G^{(32)}_{5,11}$	$G^{(33)}_{5,11}$	$G^{(34)}_{5,11}$	$G^{(35)}_{5,11}$	$G^{(36)}_{5,11}$	$G^{(37)}_{5,11}$	$G^{(38)}_{5,11}$	$G^{(39)}_{5,11}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	3	4	0	1	1	1	2	2
δ	4	3	4	4	2	4	1	4
ϵ	0	0	1	0	4	2	4	1
	$G^{(40)}_{5,11}$	$G^{(41)}_{5,11}$	$G^{(42)}_{5,11}$	$G^{(43)}_{5,11}$	$G^{(44)}_{5,11}$	$G^{(45)}_{5,11}$	$G^{(46)}_{5,11}$	$G^{(47)}_{5,11}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	0	0	2	4	0	1
δ	1	2	2	4	4	2	4	4
ϵ	2	1	4	2	0	0	1	0
	$G^{(48)}_{5,11}$	$G^{(49)}_{5,11}$	$G^{(50)}_{5,11}$	$G^{(51)}_{5,11}$	$G^{(52)}_{5,11}$	$G^{(53)}_{5,11}$	$G^{(54)}_{5,11}$	$G^{(55)}_{5,11}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	0	0
δ	2	3	1	3	1	2	2	3
ϵ	3	2	3	1	2	1	3	2
	$G^{(56)}_{5,11}$	$G^{(57)}_{5,11}$	$G^{(58)}_{5,11}$	$G^{(59)}_{5,11}$				
α	4	4	4	4				
β	1	1	2	2				
γ	2	3	0	1				
δ	3	2	3	3				
ϵ	0	0	1	0				

The Fatgraph $G_{5,12}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 3, 1, 2, 2]),# a
  Vertex([0, 3, 4, 4]),      # b
])
```

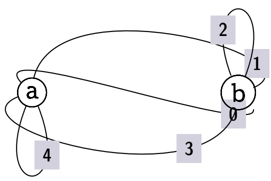
Boundary cycles

$$\alpha = ({}^2a^3 \to {}^0a^1 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^3b^0 \to {}^1b^2)$$
$$\gamma = ({}^3a^4 \to {}^5a^0)$$
$$\delta = ({}^4a^5)$$
$$\epsilon = ({}^2b^3)$$

Markings

Fatgraph $G_{5,12}$ only has the identity automorphism, so the marked fatgraphs $G_{5,12}^{(0)}$ to $G_{5,12}^{(120)}$ are formed by decorating boundary cycles of $G_{5,12}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,13}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 3, 4, 4]),# a
  Vertex([3, 0, 1, 2, 2]),# b
])
```

Boundary cycles

$$\alpha = ({}^0a^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^3 \to {}^2b^3 \to {}^4b^0 \to {}^4a^0)$$
$$\delta = ({}^3a^4)$$
$$\epsilon = ({}^3b^4)$$

Automorphisms

A_0	a	b	0	1	2	3	4	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	0	3	4	1	2	β	α	γ	ϵ	δ

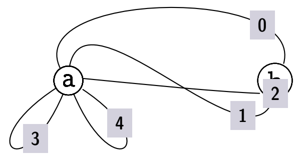
Markings

	$G_{5,13}^{(0)}$	$G_{5,13}^{(1)}$	$G_{5,13}^{(2)}$	$G_{5,13}^{(3)}$	$G_{5,13}^{(4)}$	$G_{5,13}^{(5)}$	$G_{5,13}^{(6)}$	$G_{5,13}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{5,13}^{(8)}$	$G_{5,13}^{(9)}$	$G_{5,13}^{(10)}$	$G_{5,13}^{(11)}$	$G_{5,13}^{(12)}$	$G_{5,13}^{(13)}$	$G_{5,13}^{(14)}$	$G_{5,13}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{5,13}^{(16)}$	$G_{5,13}^{(17)}$	$G_{5,13}^{(18)}$	$G_{5,13}^{(19)}$	$G_{5,13}^{(20)}$	$G_{5,13}^{(21)}$	$G_{5,13}^{(22)}$	$G_{5,13}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{5,13}^{(24)}$	$G_{5,13}^{(25)}$	$G_{5,13}^{(26)}$	$G_{5,13}^{(27)}$	$G_{5,13}^{(28)}$	$G_{5,13}^{(29)}$	$G_{5,13}^{(30)}$	$G_{5,13}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{5,13}^{(32)}$	$G_{5,13}^{(33)}$	$G_{5,13}^{(34)}$	$G_{5,13}^{(35)}$	$G_{5,13}^{(36)}$	$G_{5,13}^{(37)}$	$G_{5,13}^{(38)}$	$G_{5,13}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{5,13}^{(40)}$	$G_{5,13}^{(41)}$	$G_{5,13}^{(42)}$	$G_{5,13}^{(43)}$	$G_{5,13}^{(44)}$	$G_{5,13}^{(45)}$	$G_{5,13}^{(46)}$	$G_{5,13}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{5,13}^{(48)}$	$G_{5,13}^{(49)}$	$G_{5,13}^{(50)}$	$G_{5,13}^{(51)}$	$G_{5,13}^{(52)}$	$G_{5,13}^{(53)}$	$G_{5,13}^{(54)}$	$G_{5,13}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{5,13}^{(56)}$	$G_{5,13}^{(57)}$	$G_{5,13}^{(58)}$	$G_{5,13}^{(59)}$				
α	3	3	3	3				

(continued.)

β	4	4	4	4
γ	1	1	2	2
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{5,14}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 3, 4, 4]),# a
  Vertex([1, 2, 0]),            # b
])
```

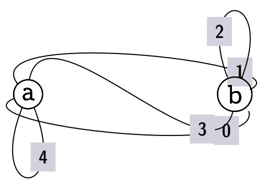
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{4}a^{5} \to {}^{6}a^{0} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}a^{4})$$
$$\epsilon = ({}^{5}a^{6})$$

Markings

Fatgraph $G_{5,14}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{5,14}$ to $G^{(120)}_{5,14}$ are formed by decorating boundary cycles of $G_{5,14}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,15}$ (60 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0, 4, 4]),# a
  Vertex([3, 0, 1, 2, 2]),# b
])
```

Boundary cycles

$$\alpha = ({}^4b^0 \to {}^0a^1 \to {}^2b^3)$$
$$\beta = ({}^1a^2 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1 \to {}^4a^0)$$
$$\delta = ({}^3a^4)$$
$$\epsilon = ({}^3b^4)$$

Automorphisms

A_0	a	b	0	1	2	3	4	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	1	0	4	3	2	γ	β	α	ϵ	δ

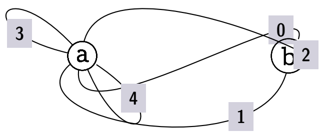
Markings

	$G^{(0)}_{5,15}$	$G^{(1)}_{5,15}$	$G^{(2)}_{5,15}$	$G^{(3)}_{5,15}$	$G^{(4)}_{5,15}$	$G^{(5)}_{5,15}$	$G^{(6)}_{5,15}$	$G^{(7)}_{5,15}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{5,15}$	$G^{(9)}_{5,15}$	$G^{(10)}_{5,15}$	$G^{(11)}_{5,15}$	$G^{(12)}_{5,15}$	$G^{(13)}_{5,15}$	$G^{(14)}_{5,15}$	$G^{(15)}_{5,15}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}_{5,15}$	$G^{(17)}_{5,15}$	$G^{(18)}_{5,15}$	$G^{(19)}_{5,15}$	$G^{(20)}_{5,15}$	$G^{(21)}_{5,15}$	$G^{(22)}_{5,15}$	$G^{(23)}_{5,15}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{5,15}$	$G^{(25)}_{5,15}$	$G^{(26)}_{5,15}$	$G^{(27)}_{5,15}$	$G^{(28)}_{5,15}$	$G^{(29)}_{5,15}$	$G^{(30)}_{5,15}$	$G^{(31)}_{5,15}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0

(continued.)

	$G_{5,15}^{(32)}$	$G_{5,15}^{(33)}$	$G_{5,15}^{(34)}$	$G_{5,15}^{(35)}$	$G_{5,15}^{(36)}$	$G_{5,15}^{(37)}$	$G_{5,15}^{(38)}$	$G_{5,15}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{5,15}^{(40)}$	$G_{5,15}^{(41)}$	$G_{5,15}^{(42)}$	$G_{5,15}^{(43)}$	$G_{5,15}^{(44)}$	$G_{5,15}^{(45)}$	$G_{5,15}^{(46)}$	$G_{5,15}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{5,15}^{(48)}$	$G_{5,15}^{(49)}$	$G_{5,15}^{(50)}$	$G_{5,15}^{(51)}$	$G_{5,15}^{(52)}$	$G_{5,15}^{(53)}$	$G_{5,15}^{(54)}$	$G_{5,15}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G_{5,15}^{(56)}$	$G_{5,15}^{(57)}$	$G_{5,15}^{(58)}$	$G_{5,15}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{5,16}$ (120 orientable markings)




```
Fatgraph([
  Vertex([2, 3, 3, 1, 0, 4, 4]),# a
  Vertex([1, 2, 0]),            # b
])
```

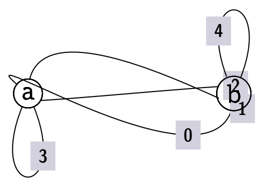
Boundary cycles

$$\alpha = ({}^{2}a^{3} \to {}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2})$$
$$\gamma = ({}^{2}b^{0} \to {}^{3}a^{4})$$
$$\delta = ({}^{4}a^{5} \to {}^{6}a^{0} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{5}a^{6})$$

Markings

Fatgraph $G_{5,16}$ only has the identity automorphism, so the marked fatgraphs $G_{5,16}^{(0)}$ to $G_{5,16}^{(120)}$ are formed by decorating boundary cycles of $G_{5,16}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,17}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 3]),# a
  Vertex([0, 1, 2, 4, 4]),# b
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{4}b^{0} \to {}^{2}b^{3})$$
$$\gamma = ({}^{2}a^{3} \to {}^{1}b^{2} \to {}^{4}a^{0})$$
$$\delta = ({}^{3}a^{4})$$
$$\epsilon = ({}^{3}b^{4})$$

Automorphisms

A_0	a	b	0	1	2	3	4	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	1	0	2	4	3	α	γ	β	ϵ	δ

Markings

	$G_{5,17}^{(0)}$	$G_{5,17}^{(1)}$	$G_{5,17}^{(2)}$	$G_{5,17}^{(3)}$	$G_{5,17}^{(4)}$	$G_{5,17}^{(5)}$	$G_{5,17}^{(6)}$	$G_{5,17}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1

	$G_{5,17}^{(8)}$	$G_{5,17}^{(9)}$	$G_{5,17}^{(10)}$	$G_{5,17}^{(11)}$	$G_{5,17}^{(12)}$	$G_{5,17}^{(13)}$	$G_{5,17}^{(14)}$	$G_{5,17}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2

	$G_{5,17}^{(16)}$	$G_{5,17}^{(17)}$	$G_{5,17}^{(18)}$	$G_{5,17}^{(19)}$	$G_{5,17}^{(20)}$	$G_{5,17}^{(21)}$	$G_{5,17}^{(22)}$	$G_{5,17}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0

	$G_{5,17}^{(24)}$	$G_{5,17}^{(25)}$	$G_{5,17}^{(26)}$	$G_{5,17}^{(27)}$	$G_{5,17}^{(28)}$	$G_{5,17}^{(29)}$	$G_{5,17}^{(30)}$	$G_{5,17}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

	$G_{5,17}^{(32)}$	$G_{5,17}^{(33)}$	$G_{5,17}^{(34)}$	$G_{5,17}^{(35)}$	$G_{5,17}^{(36)}$	$G_{5,17}^{(37)}$	$G_{5,17}^{(38)}$	$G_{5,17}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1

	$G_{5,17}^{(40)}$	$G_{5,17}^{(41)}$	$G_{5,17}^{(42)}$	$G_{5,17}^{(43)}$	$G_{5,17}^{(44)}$	$G_{5,17}^{(45)}$	$G_{5,17}^{(46)}$	$G_{5,17}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0

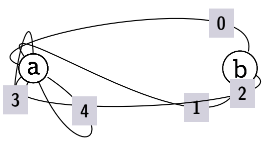
	$G_{5,17}^{(48)}$	$G_{5,17}^{(49)}$	$G_{5,17}^{(50)}$	$G_{5,17}^{(51)}$	$G_{5,17}^{(52)}$	$G_{5,17}^{(53)}$	$G_{5,17}^{(54)}$	$G_{5,17}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0

	$G_{5,17}^{(56)}$	$G_{5,17}^{(57)}$	$G_{5,17}^{(58)}$	$G_{5,17}^{(59)}$
α	4	4	4	4

(continued.)

β	1	1	2	2
γ	3	3	3	3
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{5,18}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0, 2, 3, 4, 4]),# a
  Vertex([1, 2, 0]),            # b
])
```

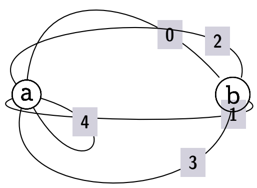
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{3}a^{4} \to {}^{0}a^{1} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}b^{0}) \\
\gamma &= ({}^{2}a^{3} \to {}^{1}b^{2}) \\
\delta &= ({}^{4}a^{5} \to {}^{6}a^{0}) \\
\epsilon &= ({}^{5}a^{6})
\end{aligned}
$$

Markings

Fatgraph $G_{5,18}$ only has the identity automorphism, so the marked fatgraphs $G_{5,18}^{(0)}$ to $G_{5,18}^{(120)}$ are formed by decorating boundary cycles of $G_{5,18}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,19}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 2, 1, 3, 4, 4]),# a
  Vertex([3, 1, 2, 0]),      # b
])
```

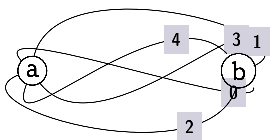
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{2}b^{3}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1}) \\
\delta &= ({}^{3}b^{0} \to {}^{3}a^{4} \to {}^{5}a^{0}) \\
\epsilon &= ({}^{4}a^{5})
\end{aligned}
$$

Markings

Fatgraph $G_{5,19}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{5,19}$ to $G^{(120)}_{5,19}$ are formed by decorating boundary cycles of $G_{5,19}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{5,20}$ (12 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 4, 3]),# a
  Vertex([2, 0, 1, 3, 4]),# b
])
```

Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}b^{1}) \\
\gamma &= ({}^{2}a^{3} \to {}^{4}b^{0}) \\
\delta &= ({}^{3}a^{4} \to {}^{3}b^{4}) \\
\epsilon &= ({}^{2}b^{3} \to {}^{4}a^{0})
\end{aligned}
$$

Automorphisms

A_0	a	b	0	1	2	3	4	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	a	b	2	0	4	1	3	β	γ	δ	ϵ	α
$A_2{}^{\ddagger}$	a	b	4	2	3	0	1	γ	δ	ϵ	α	β
$A_3{}^{\ddagger}$	a	b	3	4	1	2	0	δ	ϵ	α	β	γ
$A_4{}^{\ddagger}$	a	b	1	3	0	4	2	ϵ	α	β	γ	δ
$A_5{}^{\ddagger}$	b	a	0	2	1	4	3	β	α	ϵ	δ	γ
$A_6{}^{\ddagger}$	b	a	1	0	3	2	4	α	ϵ	δ	γ	β

A_7‡	b	a	3	1	4	0	2	ϵ	δ	γ	β	α
A_8‡	b	a	4	3	2	1	0	δ	γ	β	α	ϵ
A_9‡	b	a	2	4	0	3	1	γ	β	α	ϵ	δ

Markings

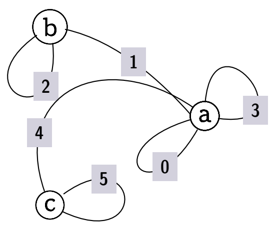
	$G_{5,20}^{(0)}$	$G_{5,20}^{(1)}$	$G_{5,20}^{(2)}$	$G_{5,20}^{(3)}$	$G_{5,20}^{(4)}$	$G_{5,20}^{(5)}$	$G_{5,20}^{(6)}$	$G_{5,20}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

	$G_{5,20}^{(8)}$	$G_{5,20}^{(9)}$	$G_{5,20}^{(10)}$	$G_{5,20}^{(11)}$
α	0	0	0	0
β	2	2	3	3
γ	3	4	1	2
δ	1	1	2	1
ϵ	4	3	4	4

Fatgraphs with 6 edges / 3 vertices

There are 65 unmarked fatgraphs in this section, originating 14520 marked fatgraphs (7260 orientable, and 7260 nonorientable).

The Fatgraph $G_{6,0}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([3, 4, 0, 0, 1, 3]),# a
  Vertex([2, 2, 1]),         # b
  Vertex([5, 5, 4]),         # c
])
```

Boundary cycles

$$\alpha = ({}^{3}a^{4} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{4}a^{5} \to {}^{2}b^{0} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}a^{3})$$
$$\gamma = ({}^{5}a^{0})$$
$$\delta = ({}^{0}b^{1})$$
$$\epsilon = ({}^{0}c^{1})$$

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	c	b	3	4	5	0	1	2	α	γ	β	ϵ	δ

Markings

	$G_{6,0}^{(0)}$	$G_{6,0}^{(1)}$	$G_{6,0}^{(2)}$	$G_{6,0}^{(3)}$	$G_{6,0}^{(4)}$	$G_{6,0}^{(5)}$	$G_{6,0}^{(6)}$	$G_{6,0}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{6,0}^{(8)}$	$G_{6,0}^{(9)}$	$G_{6,0}^{(10)}$	$G_{6,0}^{(11)}$	$G_{6,0}^{(12)}$	$G_{6,0}^{(13)}$	$G_{6,0}^{(14)}$	$G_{6,0}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{6,0}^{(16)}$	$G_{6,0}^{(17)}$	$G_{6,0}^{(18)}$	$G_{6,0}^{(19)}$	$G_{6,0}^{(20)}$	$G_{6,0}^{(21)}$	$G_{6,0}^{(22)}$	$G_{6,0}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{6,0}^{(24)}$	$G_{6,0}^{(25)}$	$G_{6,0}^{(26)}$	$G_{6,0}^{(27)}$	$G_{6,0}^{(28)}$	$G_{6,0}^{(29)}$	$G_{6,0}^{(30)}$	$G_{6,0}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

(continued.)

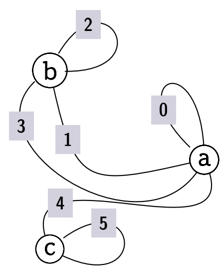
	$G_{6,0}^{(32)}$	$G_{6,0}^{(33)}$	$G_{6,0}^{(34)}$	$G_{6,0}^{(35)}$	$G_{6,0}^{(36)}$	$G_{6,0}^{(37)}$	$G_{6,0}^{(38)}$	$G_{6,0}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1

	$G_{6,0}^{(40)}$	$G_{6,0}^{(41)}$	$G_{6,0}^{(42)}$	$G_{6,0}^{(43)}$	$G_{6,0}^{(44)}$	$G_{6,0}^{(45)}$	$G_{6,0}^{(46)}$	$G_{6,0}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0

	$G_{6,0}^{(48)}$	$G_{6,0}^{(49)}$	$G_{6,0}^{(50)}$	$G_{6,0}^{(51)}$	$G_{6,0}^{(52)}$	$G_{6,0}^{(53)}$	$G_{6,0}^{(54)}$	$G_{6,0}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0

	$G_{6,0}^{(56)}$	$G_{6,0}^{(57)}$	$G_{6,0}^{(58)}$	$G_{6,0}^{(59)}$
α	4	4	4	4
β	1	1	2	2
γ	3	3	3	3
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{6,1}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 3, 4]),# a
  Vertex([3, 1, 2, 2]),   # b
  Vertex([5, 5, 4]),      # c
])
```

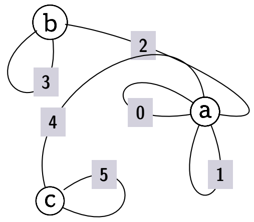
Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{3}a^{4} \to {}^{4}a^{0} \to {}^{1}a^{2} \to {}^{2}c^{0} \to {}^{3}b^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}b^{3})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,1}$ only has the identity automorphism, so the marked fatgraphs $G_{6,1}^{(0)}$ to $G_{6,1}^{(120)}$ are formed by decorating boundary cycles of $G_{6,1}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,2}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 0, 1, 1, 2]),# a
  Vertex([3, 3, 2]),         # b
  Vertex([5, 5, 4]),         # c
])
```

Boundary cycles

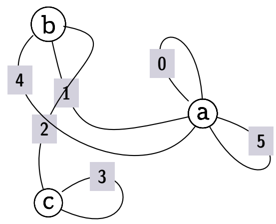
$$\alpha = ({}^{4}a^{5} \to {}^{1}c^{2} \to {}^{2}a^{3} \to {}^{0}a^{1} \to {}^{1}b^{2} \to {}^{5}a^{0} \to {}^{2}b^{0} \to {}^{2}c^{0})$$
$$\beta = ({}^{1}a^{2})$$
$$\gamma = ({}^{3}a^{4})$$
$$\delta = ({}^{0}b^{1})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,2}$ only has the identity automorphism, so the marked fatgraphs $G_{6,2}^{(0)}$ to $G_{6,2}^{(120)}$ are formed by decorating boundary cycles of $G_{6,2}$ with all permutations

of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,3}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 4, 5, 5]),# a
  Vertex([4, 1, 2]),         # b
  Vertex([3, 3, 2]),         # c
])
```

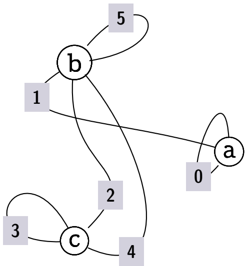
Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{3}a^{4} \rightarrow {}^{5}a^{0} \rightarrow {}^{1}a^{2} \rightarrow {}^{2}c^{0} \rightarrow {}^{1}c^{2} \rightarrow {}^{2}b^{0} \rightarrow {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \rightarrow {}^{0}b^{1})$$
$$\delta = ({}^{4}a^{5})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,3}$ only has the identity automorphism, so the marked fatgraphs $G_{6,3}^{(0)}$ to $G_{6,3}^{(120)}$ are formed by decorating boundary cycles of $G_{6,3}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,4}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),      # a
  Vertex([1, 2, 4, 5, 5]),# b
  Vertex([4, 2, 3, 3]),   # c
])
```

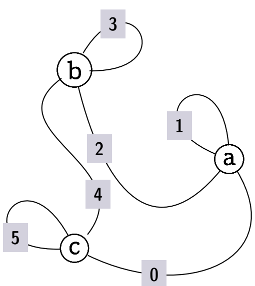
Boundary cycles

$$\alpha = ({}^4b^0 \to {}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^3c^0 \to {}^0b^1)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^2c^3)$$

Markings

Fatgraph $G_{6,4}$ only has the identity automorphism, so the marked fatgraphs $G_{6,4}^{(0)}$ to $G_{6,4}^{(120)}$ are formed by decorating boundary cycles of $G_{6,4}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,5}$ (40 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([4, 2, 3, 3]),# b
  Vertex([0, 4, 5, 5]),# c
])
```

Boundary cycles

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

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	c	a	2	3	4	5	0	1	δ	β	γ	ϵ	α
$A_2{}^{\ddagger}$	c	a	b	4	5	0	1	2	3	ϵ	β	γ	α	δ

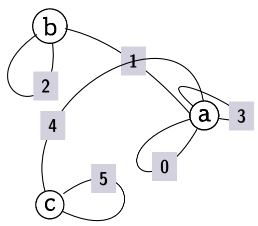
Markings

	$G_{6,5}^{(0)}$	$G_{6,5}^{(1)}$	$G_{6,5}^{(2)}$	$G_{6,5}^{(3)}$	$G_{6,5}^{(4)}$	$G_{6,5}^{(5)}$	$G_{6,5}^{(6)}$	$G_{6,5}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{6,5}^{(8)}$	$G_{6,5}^{(9)}$	$G_{6,5}^{(10)}$	$G_{6,5}^{(11)}$	$G_{6,5}^{(12)}$	$G_{6,5}^{(13)}$	$G_{6,5}^{(14)}$	$G_{6,5}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{6,5}^{(16)}$	$G_{6,5}^{(17)}$	$G_{6,5}^{(18)}$	$G_{6,5}^{(19)}$	$G_{6,5}^{(20)}$	$G_{6,5}^{(21)}$	$G_{6,5}^{(22)}$	$G_{6,5}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{6,5}^{(24)}$	$G_{6,5}^{(25)}$	$G_{6,5}^{(26)}$	$G_{6,5}^{(27)}$	$G_{6,5}^{(28)}$	$G_{6,5}^{(29)}$	$G_{6,5}^{(30)}$	$G_{6,5}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

(continued.)

	$G_{6,5}^{(32)}$	$G_{6,5}^{(33)}$	$G_{6,5}^{(34)}$	$G_{6,5}^{(35)}$	$G_{6,5}^{(36)}$	$G_{6,5}^{(37)}$	$G_{6,5}^{(38)}$	$G_{6,5}^{(39)}$
α	1	1	1	1	2	2	2	2
β	3	3	4	4	0	0	1	1
γ	0	0	0	0	1	1	0	0
δ	2	4	2	3	3	4	3	4
ϵ	4	2	3	2	4	3	4	3

The Fatgraph $G_{6,6}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 3, 0, 0, 1, 3]),# a
  Vertex([2, 2, 1]),         # b
  Vertex([5, 5, 4]),         # c
])
```

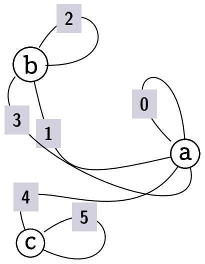
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{5}a^{0} \to {}^{2}c^{0})$$
$$\beta = ({}^{1}a^{2} \to {}^{4}a^{5} \to {}^{2}b^{0} \to {}^{3}a^{4} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3})$$
$$\delta = ({}^{0}b^{1})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,6}$ only has the identity automorphism, so the marked fatgraphs $G_{6,6}^{(0)}$ to $G_{6,6}^{(120)}$ are formed by decorating boundary cycles of $G_{6,6}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,7}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 4, 3]),# a
  Vertex([3, 1, 2, 2]),   # b
  Vertex([5, 5, 4]),      # c
])
```

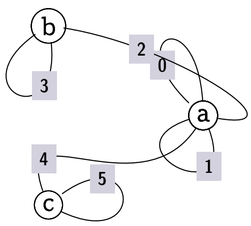
Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}b^{0} \to {}^{4}a^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}a^{4} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\delta = ({}^{2}b^{3})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,7}$ only has the identity automorphism, so the marked fatgraphs $G_{6,7}^{(0)}$ to $G_{6,7}^{(120)}$ are formed by decorating boundary cycles of $G_{6,7}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,8}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 4, 1, 2]),# a
  Vertex([3, 3, 2]),         # b
  Vertex([5, 5, 4]),         # c
])
```

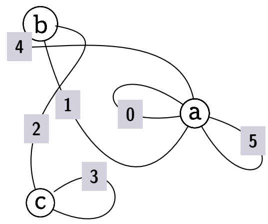
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}b^{0} \to {}^{4}a^{5} \to {}^{5}a^{0} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{3}a^{4} \to {}^{1}c^{2} \to {}^{2}c^{0}) \\
\delta &= ({}^{0}b^{1}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{6,8}$ only has the identity automorphism, so the marked fatgraphs $G_{6,8}^{(0)}$ to $G_{6,8}^{(120)}$ are formed by decorating boundary cycles of $G_{6,8}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,9}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 0, 1, 5, 5]),# a
  Vertex([4, 1, 2]),         # b
  Vertex([3, 3, 2]),         # c
])
```

Boundary cycles

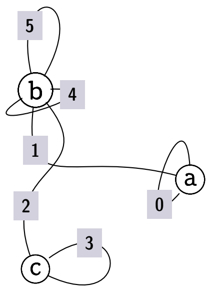
$$
\begin{aligned}
\alpha &= ({}^{2}a^{3} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2}) \\
\gamma &= ({}^{3}a^{4} \to {}^{5}a^{0} \to {}^{0}b^{1}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{6,9}$ only has the identity automorphism, so the marked fatgraphs $G_{6,9}^{(0)}$ to $G_{6,9}^{(120)}$ are formed by decorating boundary cycles of $G_{6,9}$ with all permutations

of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,10}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),          # a
  Vertex([4, 1, 2, 4, 5, 5]),# b
  Vertex([3, 3, 2]),          # c
])
```

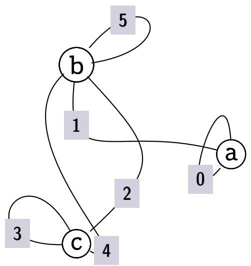
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{2}b^{3} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}a^{0})$$
$$\gamma = ({}^{5}b^{0} \to {}^{3}b^{4})$$
$$\delta = ({}^{4}b^{5})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,10}$ only has the identity automorphism, so the marked fatgraphs $G_{6,10}^{(0)}$ to $G_{6,10}^{(120)}$ are formed by decorating boundary cycles of $G_{6,10}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,11}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),      # a
  Vertex([4, 1, 2, 5, 5]),# b
  Vertex([4, 2, 3, 3]),   # c
])
```

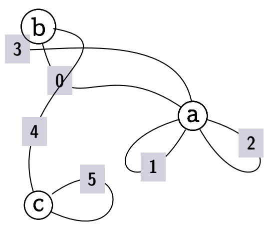
Boundary cycles

$$\alpha = ({}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^3c^0 \to {}^1b^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^4b^0 \to {}^0c^1 \to {}^2b^3)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^2c^3)$$

Markings

Fatgraph $G_{6,11}$ only has the identity automorphism, so the marked fatgraphs $G_{6,11}^{(0)}$ to $G_{6,11}^{(120)}$ are formed by decorating boundary cycles of $G_{6,11}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,12}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 1, 1, 2, 2]),# a
  Vertex([3, 0, 4]),         # b
  Vertex([5, 5, 4]),         # c
])
```

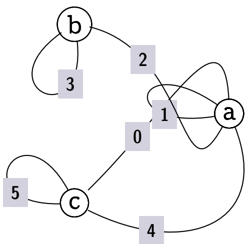
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{2}c^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}a^{4} \to {}^{5}a^{0} \to {}^{0}b^{1}) \\
\gamma &= ({}^{2}a^{3}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}$$

Markings

Fatgraph $G_{6,12}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,12}$ to $G^{(120)}_{6,12}$ are formed by decorating boundary cycles of $G_{6,12}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,13}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 1, 2, 4]),# a
  Vertex([3, 3, 2]),      # b
  Vertex([4, 0, 5, 5]),   # c
])
```

Boundary cycles

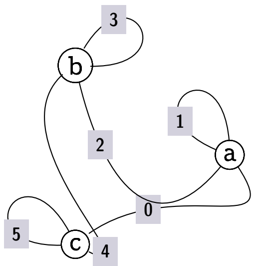
$$\begin{aligned}
\alpha &= ({}^{3}a^{4} \to {}^{2}a^{3} \to {}^{0}a^{1} \to {}^{1}b^{2} \to {}^{0}c^{1} \to {}^{2}b^{0}) \\
\beta &= ({}^{1}a^{2}) \\
\gamma &= ({}^{3}c^{0} \to {}^{1}c^{2} \to {}^{4}a^{0}) \\
\delta &= ({}^{0}b^{1}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,13}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,13}$ to $G^{(120)}_{6,13}$ are formed by decorating boundary cycles of $G_{6,13}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,14}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([4, 2, 3, 3]),# b
  Vertex([4, 0, 5, 5]),# c
])
```

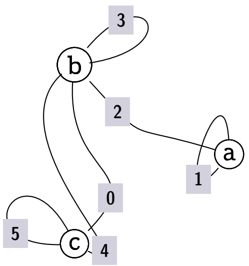
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}a^{0} \to {}^{3}b^{0} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\delta &= ({}^{2}b^{3}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,14}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,14}$ to $G^{(120)}_{6,14}$ are formed by decorating boundary cycles of $G_{6,14}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,15}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),      # a
  Vertex([4, 0, 2, 3, 3]),# b
  Vertex([4, 0, 5, 5]),   # c
])
```

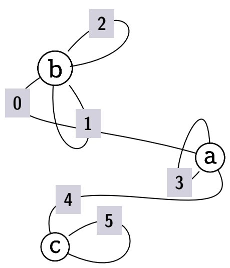
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^4b^0 \to {}^1a^2 \to {}^0a^1 \to {}^1b^2 \to {}^0c^1 \to {}^2b^3) \\
\beta &= ({}^2a^0) \\
\gamma &= ({}^3c^0 \to {}^1c^2 \to {}^0b^1) \\
\delta &= ({}^3b^4) \\
\epsilon &= ({}^2c^3)
\end{aligned}
$$

Markings

Fatgraph $G_{6,15}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,15}$ to $G^{(120)}_{6,15}$ are formed by decorating boundary cycles of $G_{6,15}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,16}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 3, 4]),   # a
  Vertex([0, 1, 1, 2, 2]),# b
  Vertex([5, 5, 4]),      # c
])
```

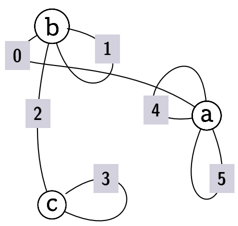
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^4b^0 \to {}^2b^3 \to {}^0a^1 \to {}^0b^1)$$
$$\beta = ({}^2a^3 \to {}^3a^0 \to {}^1c^2 \to {}^2c^0)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0c^1)$$

Markings

Fatgraph $G_{6,16}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,16}$ to $G^{(120)}_{6,16}$ are formed by decorating boundary cycles of $G_{6,16}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,17}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 4, 5, 5]),# a
  Vertex([0, 1, 1, 2]),   # b
  Vertex([3, 3, 2]),      # c
])
```

Boundary cycles

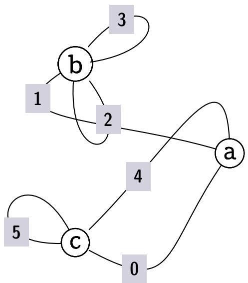
$$\alpha = ({}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^1c^2 \to {}^2c^0 \to {}^0b^1)$$
$$\beta = ({}^2a^3 \to {}^4a^0)$$
$$\gamma = ({}^3a^4)$$
$$\delta = ({}^1b^2)$$
$$\epsilon = ({}^0c^1)$$

Markings

Fatgraph $G_{6,17}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,17}$ to $G^{(120)}_{6,17}$ are formed by decorating boundary cycles of $G_{6,17}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,18}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([1, 2, 2, 3, 3]),# b
  Vertex([0, 4, 5, 5]),   # c
])
```

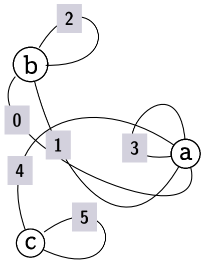
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^4b^0 \to {}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^0c^1 \to {}^0b^1) \\
\beta &= ({}^2a^0 \to {}^3c^0 \to {}^1c^2) \\
\gamma &= ({}^1b^2) \\
\delta &= ({}^3b^4) \\
\epsilon &= ({}^2c^3)
\end{aligned}$$

Markings

Fatgraph $G_{6,18}$ only has the identity automorphism, so the marked fatgraphs $G_{6,18}^{(0)}$ to $G_{6,18}^{(120)}$ are formed by decorating boundary cycles of $G_{6,18}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,19}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 4, 3, 1, 0]),# a
  Vertex([0, 1, 2, 2]),   # b
  Vertex([5, 5, 4]),      # c
])
```

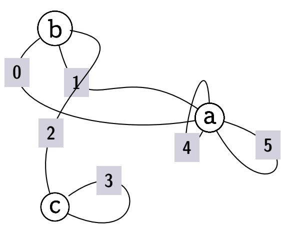
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\beta = ({}^{2}a^{3} \to {}^{3}b^{0} \to {}^{4}a^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{3}a^{4} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}b^{3})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,19}$ only has the identity automorphism, so the marked fatgraphs $G_{6,19}^{(0)}$ to $G_{6,19}^{(120)}$ are formed by decorating boundary cycles of $G_{6,19}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section “Markings of fatgraphs with trivial automorphisms” for a complete table.

The Fatgraph $G_{6,20}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0, 4, 5, 5]),# a
  Vertex([0, 1, 2]),         # b
  Vertex([3, 3, 2]),         # c
])
```

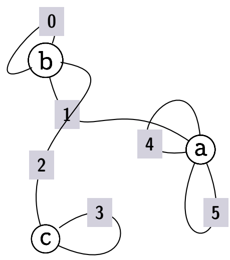
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}a^{3} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}b^{1}) \\
\gamma &= ({}^{3}a^{4} \to {}^{5}a^{0}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}$$

Markings

Fatgraph $G_{6,20}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,20}$ to $G^{(120)}_{6,20}$ are formed by decorating boundary cycles of $G_{6,20}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,21}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 4, 5, 5]),# a
  Vertex([0, 1, 2, 0]),   # b
  Vertex([3, 3, 2]),      # c
])
```

Boundary cycles

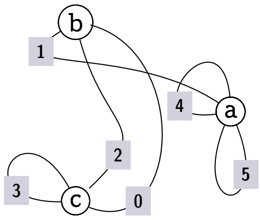
$$\begin{aligned}
\alpha &= ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{2}b^{3} \to {}^{1}b^{2}) \\
\beta &= ({}^{2}a^{3} \to {}^{4}a^{0}) \\
\gamma &= ({}^{3}a^{4}) \\
\delta &= ({}^{3}b^{0}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}$$

Markings

Fatgraph $G_{6,21}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,21}$ to $G^{(120)}_{6,21}$ are formed by decorating boundary cycles of $G_{6,21}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,22}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 4, 5, 5]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([0, 2, 3, 3]),   # c
])
```

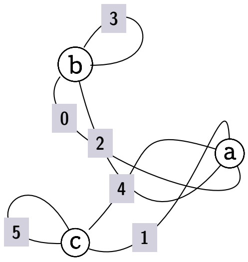
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{2}b^{0}) \\
\beta &= ({}^{2}a^{3} \to {}^{4}a^{0}) \\
\gamma &= ({}^{3}a^{4}) \\
\delta &= ({}^{0}c^{1} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,22}$ only has the identity automorphism, so the marked fatgraphs $G_{6,22}^{(0)}$ to $G_{6,22}^{(120)}$ are formed by decorating boundary cycles of $G_{6,22}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,23}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([0, 2, 3, 3]),# b
  Vertex([1, 4, 5, 5]),# c
])
```

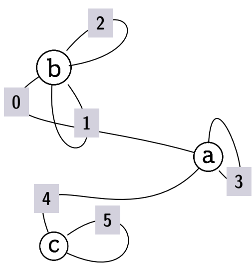
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{3}c^{0} \to {}^{1}c^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}a^{0} \to {}^{3}b^{0} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1}) \\
\delta &= ({}^{2}b^{3}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,23}$ only has the identity automorphism, so the marked fatgraphs $G_{6,23}^{(0)}$ to $G_{6,23}^{(120)}$ are formed by decorating boundary cycles of $G_{6,23}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,24}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 4, 3]),   # a
  Vertex([0, 1, 1, 2, 2]),# b
  Vertex([5, 5, 4]),      # c
])
```

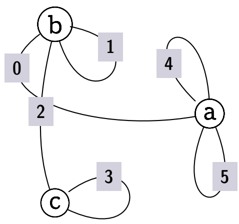
Boundary cycles

$$\alpha = ({}^4b^0 \to {}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^2a^3 \to {}^1c^2 \to {}^2c^0 \to {}^0b^1)$$
$$\beta = ({}^3a^0)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0c^1)$$

Markings

Fatgraph $G_{6,24}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,24}$ to $G^{(120)}_{6,24}$ are formed by decorating boundary cycles of $G_{6,24}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,25}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 4, 0, 5, 5]),# a
  Vertex([0, 1, 1, 2]),   # b
  Vertex([3, 3, 2]),      # c
])
```

Boundary cycles

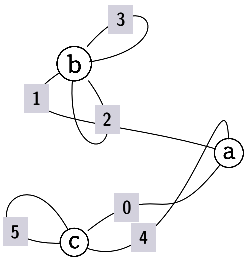
$$\alpha = ({}^0a^1)$$
$$\beta = ({}^4a^0 \to {}^1a^2 \to {}^2b^3 \to {}^2a^3 \to {}^3b^0 \to {}^1c^2 \to {}^2c^0 \to {}^0b^1)$$
$$\gamma = ({}^3a^4)$$
$$\delta = ({}^1b^2)$$
$$\epsilon = ({}^0c^1)$$

Markings

Fatgraph $G_{6,25}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,25}$ to $G^{(120)}_{6,25}$ are formed by decorating boundary cycles of $G_{6,25}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,26}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([1, 2, 2, 3, 3]),# b
  Vertex([4, 0, 5, 5]),   # c
])
```

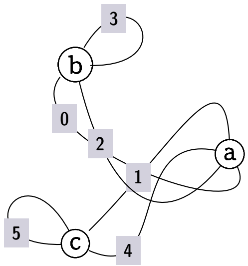
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{4}b^{0} \to {}^{3}c^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{2}a^{0} \to {}^{0}c^{1}) \\
\gamma &= ({}^{1}b^{2}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}
$$

Markings

Fatgraph $G_{6,26}$ only has the identity automorphism, so the marked fatgraphs $G_{6,26}^{(0)}$ to $G_{6,26}^{(120)}$ are formed by decorating boundary cycles of $G_{6,26}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,27}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([0, 2, 3, 3]),# b
  Vertex([4, 1, 5, 5]),# c
])
```

Boundary cycles

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

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	c	b	4	2	1	5	0	3	γ	β	α	ϵ	δ

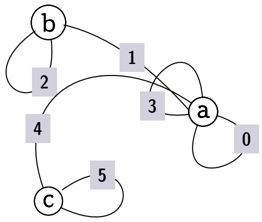
Markings

	$G^{(0)}_{6,27}$	$G^{(1)}_{6,27}$	$G^{(2)}_{6,27}$	$G^{(3)}_{6,27}$	$G^{(4)}_{6,27}$	$G^{(5)}_{6,27}$	$G^{(6)}_{6,27}$	$G^{(7)}_{6,27}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{6,27}$	$G^{(9)}_{6,27}$	$G^{(10)}_{6,27}$	$G^{(11)}_{6,27}$	$G^{(12)}_{6,27}$	$G^{(13)}_{6,27}$	$G^{(14)}_{6,27}$	$G^{(15)}_{6,27}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{6,27}^{(16)}$	$G_{6,27}^{(17)}$	$G_{6,27}^{(18)}$	$G_{6,27}^{(19)}$	$G_{6,27}^{(20)}$	$G_{6,27}^{(21)}$	$G_{6,27}^{(22)}$	$G_{6,27}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{6,27}^{(24)}$	$G_{6,27}^{(25)}$	$G_{6,27}^{(26)}$	$G_{6,27}^{(27)}$	$G_{6,27}^{(28)}$	$G_{6,27}^{(29)}$	$G_{6,27}^{(30)}$	$G_{6,27}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G_{6,27}^{(32)}$	$G_{6,27}^{(33)}$	$G_{6,27}^{(34)}$	$G_{6,27}^{(35)}$	$G_{6,27}^{(36)}$	$G_{6,27}^{(37)}$	$G_{6,27}^{(38)}$	$G_{6,27}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{6,27}^{(40)}$	$G_{6,27}^{(41)}$	$G_{6,27}^{(42)}$	$G_{6,27}^{(43)}$	$G_{6,27}^{(44)}$	$G_{6,27}^{(45)}$	$G_{6,27}^{(46)}$	$G_{6,27}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{6,27}^{(48)}$	$G_{6,27}^{(49)}$	$G_{6,27}^{(50)}$	$G_{6,27}^{(51)}$	$G_{6,27}^{(52)}$	$G_{6,27}^{(53)}$	$G_{6,27}^{(54)}$	$G_{6,27}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G_{6,27}^{(56)}$	$G_{6,27}^{(57)}$	$G_{6,27}^{(58)}$	$G_{6,27}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{6,28}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([3, 4, 3, 0, 1, 0]),# a
  Vertex([2, 2, 1]),         # b
  Vertex([5, 5, 4]),         # c
])
```

Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\beta = ({}^{2}a^{3} \to {}^{5}a^{0})$$
$$\gamma = ({}^{4}a^{5} \to {}^{2}b^{0} \to {}^{3}a^{4} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}b^{1})$$
$$\epsilon = ({}^{0}c^{1})$$

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	c	b	3	4	5	0	1	2	γ	β	α	ϵ	δ

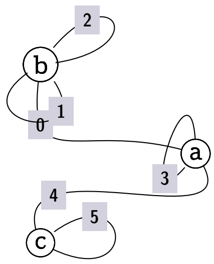
Markings

	$G^{(0)}_{6,28}$	$G^{(1)}_{6,28}$	$G^{(2)}_{6,28}$	$G^{(3)}_{6,28}$	$G^{(4)}_{6,28}$	$G^{(5)}_{6,28}$	$G^{(6)}_{6,28}$	$G^{(7)}_{6,28}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{6,28}$	$G^{(9)}_{6,28}$	$G^{(10)}_{6,28}$	$G^{(11)}_{6,28}$	$G^{(12)}_{6,28}$	$G^{(13)}_{6,28}$	$G^{(14)}_{6,28}$	$G^{(15)}_{6,28}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{6,28}^{(16)}$	$G_{6,28}^{(17)}$	$G_{6,28}^{(18)}$	$G_{6,28}^{(19)}$	$G_{6,28}^{(20)}$	$G_{6,28}^{(21)}$	$G_{6,28}^{(22)}$	$G_{6,28}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{6,28}^{(24)}$	$G_{6,28}^{(25)}$	$G_{6,28}^{(26)}$	$G_{6,28}^{(27)}$	$G_{6,28}^{(28)}$	$G_{6,28}^{(29)}$	$G_{6,28}^{(30)}$	$G_{6,28}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G_{6,28}^{(32)}$	$G_{6,28}^{(33)}$	$G_{6,28}^{(34)}$	$G_{6,28}^{(35)}$	$G_{6,28}^{(36)}$	$G_{6,28}^{(37)}$	$G_{6,28}^{(38)}$	$G_{6,28}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{6,28}^{(40)}$	$G_{6,28}^{(41)}$	$G_{6,28}^{(42)}$	$G_{6,28}^{(43)}$	$G_{6,28}^{(44)}$	$G_{6,28}^{(45)}$	$G_{6,28}^{(46)}$	$G_{6,28}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{6,28}^{(48)}$	$G_{6,28}^{(49)}$	$G_{6,28}^{(50)}$	$G_{6,28}^{(51)}$	$G_{6,28}^{(52)}$	$G_{6,28}^{(53)}$	$G_{6,28}^{(54)}$	$G_{6,28}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G_{6,28}^{(56)}$	$G_{6,28}^{(57)}$	$G_{6,28}^{(58)}$	$G_{6,28}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{6,29}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 0, 3, 4]),   # a
  Vertex([1, 0, 1, 2, 2]),# b
  Vertex([5, 5, 4]),      # c
])
```

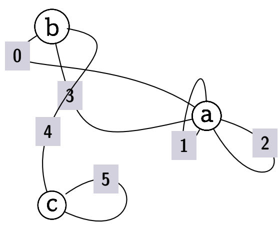
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}b^{1} \to {}^{0}a^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}a^{3} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\gamma = ({}^{4}b^{0} \to {}^{2}b^{3})$$
$$\delta = ({}^{3}b^{4})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,29}$ only has the identity automorphism, so the marked fatgraphs $G_{6,29}^{(0)}$ to $G_{6,29}^{(120)}$ are formed by decorating boundary cycles of $G_{6,29}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,30}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 3, 1, 2, 2]),# a
  Vertex([0, 3, 4]),         # b
  Vertex([5, 5, 4]),         # c
])
```

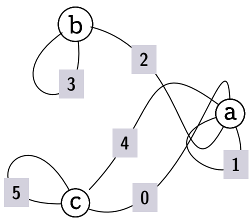
Boundary cycles

$$\alpha = ({}^{2}a^{3} \to {}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{0} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{3}a^{4} \to {}^{5}a^{0})$$
$$\delta = ({}^{4}a^{5})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,30}$ only has the identity automorphism, so the marked fatgraphs $G_{6,30}^{(0)}$ to $G_{6,30}^{(120)}$ are formed by decorating boundary cycles of $G_{6,30}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,31}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 4, 1, 2, 1]),# a
  Vertex([3, 3, 2]),      # b
  Vertex([0, 4, 5, 5]),   # c
])
```

Boundary cycles

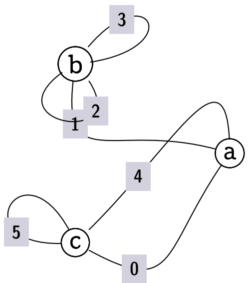
$$\alpha = ({}^{0}a^{1} \to {}^{3}c^{0} \to {}^{1}c^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}c^{1} \to {}^{4}a^{0})$$
$$\gamma = ({}^{2}a^{3} \to {}^{2}b^{0} \to {}^{3}a^{4} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}b^{1})$$
$$\epsilon = ({}^{2}c^{3})$$

Markings

Fatgraph $G_{6,31}$ only has the identity automorphism, so the marked fatgraphs $G_{6,31}^{(0)}$ to $G_{6,31}^{(120)}$ are formed by decorating boundary cycles of $G_{6,31}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,32}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([2, 1, 2, 3, 3]),# b
  Vertex([0, 4, 5, 5]),   # c
])
```

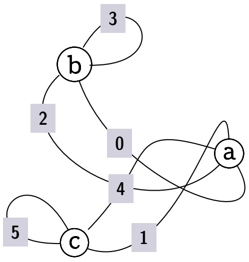
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0b^1 \to {}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2a^0 \to {}^3c^0 \to {}^1c^2)$$
$$\gamma = ({}^4b^0 \to {}^2b^3)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^2c^3)$$

Markings

Fatgraph $G_{6,32}$ only has the identity automorphism, so the marked fatgraphs $G_{6,32}^{(0)}$ to $G_{6,32}^{(120)}$ are formed by decorating boundary cycles of $G_{6,32}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,33}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([2, 0, 3, 3]),# b
  Vertex([1, 4, 5, 5]),# c
])
```

Boundary cycles

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

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	c	b	4	2	1	5	0	3	γ	β	α	ϵ	δ

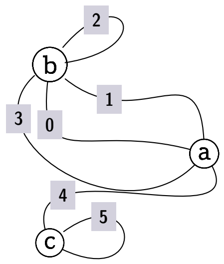
Markings

	$G^{(0)}_{6,33}$	$G^{(1)}_{6,33}$	$G^{(2)}_{6,33}$	$G^{(3)}_{6,33}$	$G^{(4)}_{6,33}$	$G^{(5)}_{6,33}$	$G^{(6)}_{6,33}$	$G^{(7)}_{6,33}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{6,33}$	$G^{(9)}_{6,33}$	$G^{(10)}_{6,33}$	$G^{(11)}_{6,33}$	$G^{(12)}_{6,33}$	$G^{(13)}_{6,33}$	$G^{(14)}_{6,33}$	$G^{(15)}_{6,33}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G^{(16)}_{6,33}$	$G^{(17)}_{6,33}$	$G^{(18)}_{6,33}$	$G^{(19)}_{6,33}$	$G^{(20)}_{6,33}$	$G^{(21)}_{6,33}$	$G^{(22)}_{6,33}$	$G^{(23)}_{6,33}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{6,33}$	$G^{(25)}_{6,33}$	$G^{(26)}_{6,33}$	$G^{(27)}_{6,33}$	$G^{(28)}_{6,33}$	$G^{(29)}_{6,33}$	$G^{(30)}_{6,33}$	$G^{(31)}_{6,33}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G^{(32)}_{6,33}$	$G^{(33)}_{6,33}$	$G^{(34)}_{6,33}$	$G^{(35)}_{6,33}$	$G^{(36)}_{6,33}$	$G^{(37)}_{6,33}$	$G^{(38)}_{6,33}$	$G^{(39)}_{6,33}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G^{(40)}_{6,33}$	$G^{(41)}_{6,33}$	$G^{(42)}_{6,33}$	$G^{(43)}_{6,33}$	$G^{(44)}_{6,33}$	$G^{(45)}_{6,33}$	$G^{(46)}_{6,33}$	$G^{(47)}_{6,33}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G^{(48)}_{6,33}$	$G^{(49)}_{6,33}$	$G^{(50)}_{6,33}$	$G^{(51)}_{6,33}$	$G^{(52)}_{6,33}$	$G^{(53)}_{6,33}$	$G^{(54)}_{6,33}$	$G^{(55)}_{6,33}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G^{(56)}_{6,33}$	$G^{(57)}_{6,33}$	$G^{(58)}_{6,33}$	$G^{(59)}_{6,33}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{6,34}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 3, 4]),   # a
  Vertex([3, 0, 1, 2, 2]),# b
  Vertex([5, 5, 4]),      # c
])
```

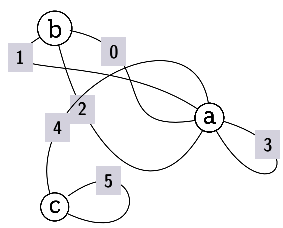
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}b^{1}) \\
\gamma &= ({}^{4}b^{0} \to {}^{2}a^{3} \to {}^{2}b^{3} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{2}c^{0}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}$$

Markings

Fatgraph $G_{6,34}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,34}$ to $G^{(120)}_{6,34}$ are formed by decorating boundary cycles of $G_{6,34}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,35}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0, 2, 3, 3]),# a
  Vertex([1, 2, 0]),         # b
  Vertex([5, 5, 4]),         # c
])
```

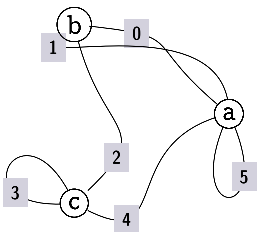
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{3}a^{4} \to {}^{5}a^{0} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}b^{0}) \\
\gamma &= ({}^{2}a^{3} \to {}^{1}b^{2}) \\
\delta &= ({}^{4}a^{5}) \\
\epsilon &= ({}^{0}c^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{6,35}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,35}$ to $G^{(120)}_{6,35}$ are formed by decorating boundary cycles of $G_{6,35}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,36}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 4, 5, 5]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 2, 3, 3]),   # c
])
```

Boundary cycles

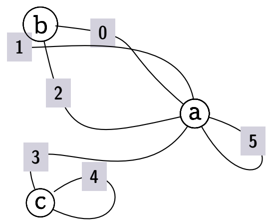
$$
\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{4}a^{0}) \\
\delta &= ({}^{3}a^{4}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}
$$

Markings

Fatgraph $G_{6,36}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,36}$ to $G^{(120)}_{6,36}$ are formed by decorating boundary cycles of $G_{6,36}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,37}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 5, 5]),# a
  Vertex([1, 2, 0]),         # b
  Vertex([4, 4, 3]),         # c
])
```

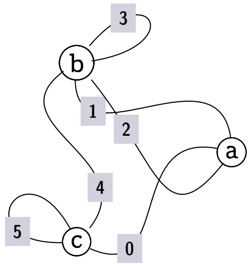
Boundary cycles

$$\alpha = ({}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^1b^2)$$
$$\gamma = ({}^3a^4 \to {}^1c^2 \to {}^2a^3 \to {}^0b^1 \to {}^5a^0 \to {}^2c^0)$$
$$\delta = ({}^4a^5)$$
$$\epsilon = ({}^0c^1)$$

Markings

Fatgraph $G_{6,37}$ only has the identity automorphism, so the marked fatgraphs $G_{6,37}^{(0)}$ to $G_{6,37}^{(120)}$ are formed by decorating boundary cycles of $G_{6,37}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,38}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([4, 1, 2, 3, 3]),# b
  Vertex([0, 4, 5, 5]),   # c
])
```

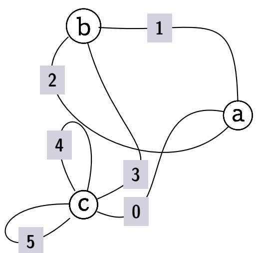
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{4}b^{0} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{2}b^{3}) \\
\gamma &= ({}^{2}a^{0} \to {}^{1}b^{2}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,38}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,38}$ to $G^{(120)}_{6,38}$ are formed by decorating boundary cycles of $G_{6,38}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,39}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),         # a
  Vertex([2, 3, 1]),         # b
  Vertex([0, 3, 4, 4, 5, 5]),# c
])
```

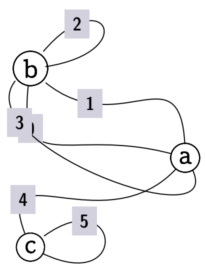
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{5}c^{0} \to {}^{3}c^{4} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{4}c^{5})$$

Markings

Fatgraph $G_{6,39}$ only has the identity automorphism, so the marked fatgraphs $G_{6,39}^{(0)}$ to $G_{6,39}^{(120)}$ are formed by decorating boundary cycles of $G_{6,39}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,40}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 4, 3]),   # a
  Vertex([3, 0, 1, 2, 2]),# b
  Vertex([5, 5, 4]),      # c
])
```

Boundary cycles

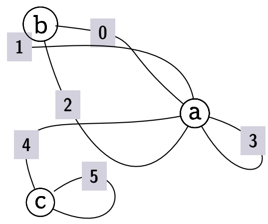
$$\alpha = ({}^{0}a^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\gamma = ({}^{3}a^{0} \to {}^{4}b^{0} \to {}^{2}b^{3})$$
$$\delta = ({}^{3}b^{4})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,40}$ only has the identity automorphism, so the marked fatgraphs $G_{6,40}^{(0)}$ to $G_{6,40}^{(120)}$ are formed by decorating boundary cycles of $G_{6,40}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,41}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 4, 2, 3, 3]),# a
  Vertex([1, 2, 0]),         # b
  Vertex([5, 5, 4]),         # c
])
```

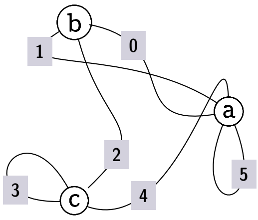
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}a^{3} \to {}^{1}b^{2} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\gamma = ({}^{3}a^{4} \to {}^{5}a^{0} \to {}^{0}b^{1})$$
$$\delta = ({}^{4}a^{5})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,41}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,41}$ to $G^{(120)}_{6,41}$ are formed by decorating boundary cycles of $G_{6,41}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,42}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0, 5, 5]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 2, 3, 3]),   # c
])
```

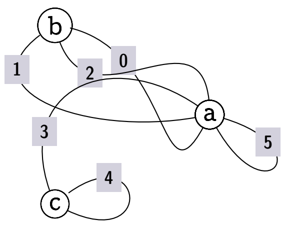
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{0})$$
$$\gamma = ({}^{2}a^{3} \to {}^{1}b^{2} \to {}^{0}c^{1} \to {}^{4}a^{0})$$
$$\delta = ({}^{3}a^{4})$$
$$\epsilon = ({}^{2}c^{3})$$

Markings

Fatgraph $G_{6,42}$ only has the identity automorphism, so the marked fatgraphs $G_{6,42}^{(0)}$ to $G_{6,42}^{(120)}$ are formed by decorating boundary cycles of $G_{6,42}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,43}$ (120 orientable markings)




```
Fatgraph([
  Vertex([2, 3, 1, 0, 5, 5]),# a
  Vertex([1, 2, 0]),         # b
  Vertex([4, 4, 3]),         # c
])
```

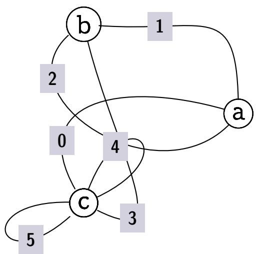
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0b^1 \to {}^0a^1 \to {}^1c^2 \to {}^2c^0)$$
$$\beta = ({}^2a^3 \to {}^2b^0)$$
$$\gamma = ({}^3a^4 \to {}^5a^0 \to {}^1b^2)$$
$$\delta = ({}^4a^5)$$
$$\epsilon = ({}^0c^1)$$

Markings

Fatgraph $G_{6,43}$ only has the identity automorphism, so the marked fatgraphs $G_{6,43}^{(0)}$ to $G_{6,43}^{(120)}$ are formed by decorating boundary cycles of $G_{6,43}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,44}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),          # a
  Vertex([2, 3, 1]),          # b
  Vertex([3, 4, 4, 0, 5, 5]),# c
])
```

Boundary cycles

$$\alpha = ({}^5c^0 \to {}^3c^4 \to {}^0a^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^2c^3 \to {}^0c^1 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^1c^2)$$
$$\epsilon = ({}^4c^5)$$

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	c	3	2	1	0	5	4	β	α	γ	ϵ	δ

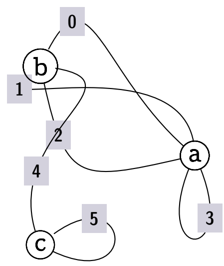
Markings

	$G_{6,44}^{(0)}$	$G_{6,44}^{(1)}$	$G_{6,44}^{(2)}$	$G_{6,44}^{(3)}$	$G_{6,44}^{(4)}$	$G_{6,44}^{(5)}$	$G_{6,44}^{(6)}$	$G_{6,44}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{6,44}^{(8)}$	$G_{6,44}^{(9)}$	$G_{6,44}^{(10)}$	$G_{6,44}^{(11)}$	$G_{6,44}^{(12)}$	$G_{6,44}^{(13)}$	$G_{6,44}^{(14)}$	$G_{6,44}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{6,44}^{(16)}$	$G_{6,44}^{(17)}$	$G_{6,44}^{(18)}$	$G_{6,44}^{(19)}$	$G_{6,44}^{(20)}$	$G_{6,44}^{(21)}$	$G_{6,44}^{(22)}$	$G_{6,44}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{6,44}^{(24)}$	$G_{6,44}^{(25)}$	$G_{6,44}^{(26)}$	$G_{6,44}^{(27)}$	$G_{6,44}^{(28)}$	$G_{6,44}^{(29)}$	$G_{6,44}^{(30)}$	$G_{6,44}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{6,44}^{(32)}$	$G_{6,44}^{(33)}$	$G_{6,44}^{(34)}$	$G_{6,44}^{(35)}$	$G_{6,44}^{(36)}$	$G_{6,44}^{(37)}$	$G_{6,44}^{(38)}$	$G_{6,44}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{6,44}^{(40)}$	$G_{6,44}^{(41)}$	$G_{6,44}^{(42)}$	$G_{6,44}^{(43)}$	$G_{6,44}^{(44)}$	$G_{6,44}^{(45)}$	$G_{6,44}^{(46)}$	$G_{6,44}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{6,44}^{(48)}$	$G_{6,44}^{(49)}$	$G_{6,44}^{(50)}$	$G_{6,44}^{(51)}$	$G_{6,44}^{(52)}$	$G_{6,44}^{(53)}$	$G_{6,44}^{(54)}$	$G_{6,44}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0

(continued.)

δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{6,44}^{(56)}$	$G_{6,44}^{(57)}$	$G_{6,44}^{(58)}$	$G_{6,44}^{(59)}$				
α	3	3	3	3				
β	4	4	4	4				
γ	1	1	2	2				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{6,45}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 3]),# a
  Vertex([1, 2, 4, 0]),   # b
  Vertex([5, 5, 4]),      # c
])
```

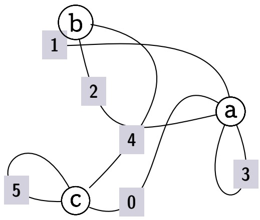
Boundary cycles

$$\alpha = ({}^{3}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{3} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{4}a^{0})$$
$$\delta = ({}^{3}a^{4})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,45}$ only has the identity automorphism, so the marked fatgraphs $G_{6,45}^{(0)}$ to $G_{6,45}^{(120)}$ are formed by decorating boundary cycles of $G_{6,45}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,46}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 3]),# a
  Vertex([1, 2, 4]),      # b
  Vertex([0, 4, 5, 5]),   # c
])
```

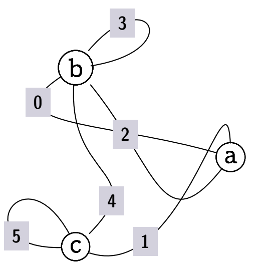
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{4}a^{0})$$
$$\delta = ({}^{3}a^{4})$$
$$\epsilon = ({}^{2}c^{3})$$

Markings

Fatgraph $G_{6,46}$ only has the identity automorphism, so the marked fatgraphs $G_{6,46}^{(0)}$ to $G_{6,46}^{(120)}$ are formed by decorating boundary cycles of $G_{6,46}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,47}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([0, 4, 2, 3, 3]),# b
  Vertex([1, 4, 5, 5]),   # c
])
```

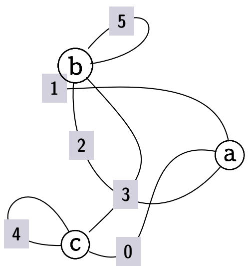
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{4}b^{0} \to {}^{2}b^{3}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,47}$ only has the identity automorphism, so the marked fatgraphs $G_{6,47}^{(0)}$ to $G_{6,47}^{(120)}$ are formed by decorating boundary cycles of $G_{6,47}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,48}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([1, 2, 3, 5, 5]),# b
  Vertex([0, 3, 4, 4]),   # c
])
```

Boundary cycles

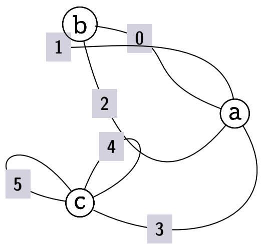
$$\begin{aligned}
\alpha &= ({}^{4}b^{0} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{2}b^{3}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}b^{1}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{2}c^{3})
\end{aligned}$$

Markings

Fatgraph $G_{6,48}$ only has the identity automorphism, so the marked fatgraphs $G_{6,48}^{(0)}$ to $G_{6,48}^{(120)}$ are formed by decorating boundary cycles of $G_{6,48}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,49}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),   # a
  Vertex([1, 2, 0]),      # b
  Vertex([3, 4, 4, 5, 5]),# c
])
```

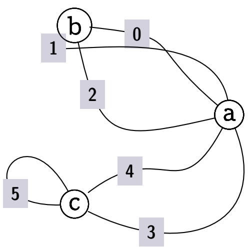
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{4}c^{0} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}a^{0} \to {}^{0}c^{1} \to {}^{2}c^{3}) \\
\delta &= ({}^{1}c^{2}) \\
\epsilon &= ({}^{3}c^{4})
\end{aligned}
$$

Markings

Fatgraph $G_{6,49}$ only has the identity automorphism, so the marked fatgraphs $G_{6,49}^{(0)}$ to $G_{6,49}^{(120)}$ are formed by decorating boundary cycles of $G_{6,49}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,50}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 4, 3]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([3, 4, 5, 5]),   # c
])
```

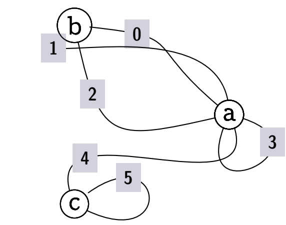
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{4}a^{0})$$
$$\delta = ({}^{3}a^{4} \to {}^{0}c^{1})$$
$$\epsilon = ({}^{2}c^{3})$$

Markings

Fatgraph $G_{6,50}$ only has the identity automorphism, so the marked fatgraphs $G_{6,50}^{(0)}$ to $G_{6,50}^{(120)}$ are formed by decorating boundary cycles of $G_{6,50}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,51}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 4, 3]),# a
  Vertex([1, 2, 0]),         # b
  Vertex([5, 5, 4]),         # c
])
```

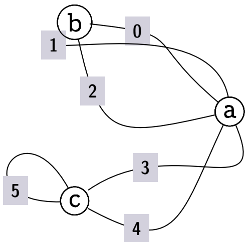
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{5}a^{0} \to {}^{0}b^{1})$$
$$\delta = ({}^{4}a^{5} \to {}^{3}a^{4} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,51}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,51}$ to $G^{(120)}_{6,51}$ are formed by decorating boundary cycles of $G_{6,51}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,52}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 4, 3]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 3, 5, 5]),   # c
])
```

Boundary cycles

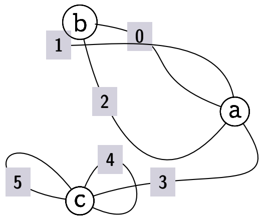
$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{0}c^{1} \to {}^{4}a^{0})$$
$$\delta = ({}^{3}a^{4} \to {}^{3}c^{0} \to {}^{1}c^{2})$$
$$\epsilon = ({}^{2}c^{3})$$

Markings

Fatgraph $G_{6,52}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{6,52}$ to $G^{(120)}_{6,52}$ are formed by decorating boundary cycles of $G_{6,52}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,53}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),   # a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 3, 4, 5, 5]),# c
])
```

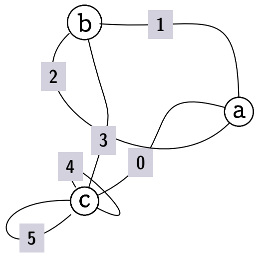
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{3}a^{0} \to {}^{0}c^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\delta &= ({}^{4}c^{0} \to {}^{2}c^{3}) \\
\epsilon &= ({}^{3}c^{4})
\end{aligned}$$

Markings

Fatgraph $G_{6,53}$ only has the identity automorphism, so the marked fatgraphs $G_{6,53}^{(0)}$ to $G_{6,53}^{(120)}$ are formed by decorating boundary cycles of $G_{6,53}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,54}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),          # a
  Vertex([2, 3, 1]),          # b
  Vertex([4, 0, 3, 4, 5, 5]),# c
])
```

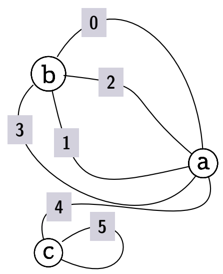
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{3} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{5}c^{0} \to {}^{3}c^{4})$$
$$\epsilon = ({}^{4}c^{5})$$

Markings

Fatgraph $G_{6,54}$ only has the identity automorphism, so the marked fatgraphs $G_{6,54}^{(0)}$ to $G_{6,54}^{(120)}$ are formed by decorating boundary cycles of $G_{6,54}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section “Markings of fatgraphs with trivial automorphisms” for a complete table.

The Fatgraph $G_{6,55}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 2, 1, 3, 4]),# a
  Vertex([3, 1, 2, 0]),   # b
  Vertex([5, 5, 4]),      # c
])
```

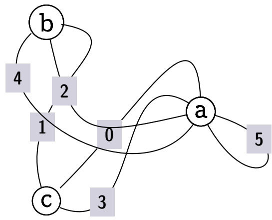
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{2}b^{3})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}b^{0} \to {}^{4}a^{0} \to {}^{3}a^{4} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\epsilon = ({}^{0}c^{1})$$

Markings

Fatgraph $G_{6,55}$ only has the identity automorphism, so the marked fatgraphs $G_{6,55}^{(0)}$ to $G_{6,55}^{(120)}$ are formed by decorating boundary cycles of $G_{6,55}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,56}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 3, 2, 4, 5, 5]),# a
  Vertex([4, 2, 1]),         # b
  Vertex([3, 0, 1]),         # c
])
```

Boundary cycles

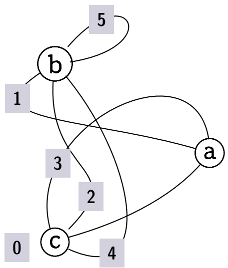
$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}b^{0} \to {}^{3}a^{4} \to {}^{1}c^{2} \to {}^{5}a^{0})$$
$$\epsilon = ({}^{4}a^{5})$$

Markings

Fatgraph $G_{6,56}$ only has the identity automorphism, so the marked fatgraphs $G_{6,56}^{(0)}$ to $G_{6,56}^{(120)}$ are formed by decorating boundary cycles of $G_{6,56}$ with all

permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,57}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0]),      # a
  Vertex([1, 2, 4, 5, 5]),# b
  Vertex([4, 2, 3, 0]),   # c
])
```

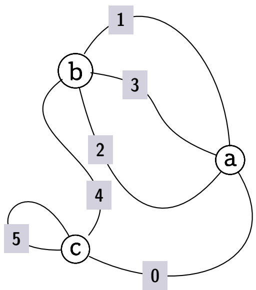
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^4b^0 \to {}^3c^0 \to {}^2b^3)$$
$$\gamma = ({}^2a^0 \to {}^2c^3)$$
$$\delta = ({}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^3b^4)$$

Markings

Fatgraph $G_{6,57}$ only has the identity automorphism, so the marked fatgraphs $G_{6,57}^{(0)}$ to $G_{6,57}^{(120)}$ are formed by decorating boundary cycles of $G_{6,57}$ with all permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,58}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 3, 2, 0]),# a
  Vertex([4, 2, 3, 1]),# b
  Vertex([0, 4, 5, 5]),# c
])
```

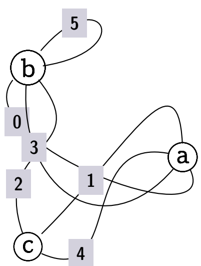
Boundary cycles

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

Markings

Fatgraph $G_{6,58}$ only has the identity automorphism, so the marked fatgraphs $G_{6,58}^{(0)}$ to $G_{6,58}^{(120)}$ are formed by decorating boundary cycles of $G_{6,58}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,59}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 3, 0]),    # a
  Vertex([0, 3, 2, 5, 5]),# b
  Vertex([4, 1, 2]),       # c
])
```

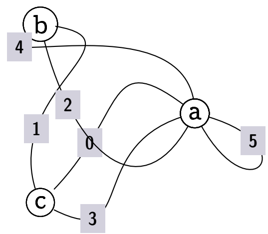
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1}) \\
\delta &= ({}^{3}a^{0} \to {}^{4}b^{0} \to {}^{1}c^{2} \to {}^{2}b^{3}) \\
\epsilon &= ({}^{3}b^{4})
\end{aligned}
$$

Markings

Fatgraph $G_{6,59}$ only has the identity automorphism, so the marked fatgraphs $G_{6,59}^{(0)}$ to $G_{6,59}^{(120)}$ are formed by decorating boundary cycles of $G_{6,59}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,60}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 3, 2, 5, 5]),# a
  Vertex([4, 2, 1]),         # b
  Vertex([3, 0, 1]),         # c
])
```

Boundary cycles

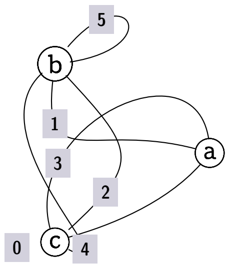
$$
\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1} \to {}^{1}c^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}c^{1}) \\
\gamma &= ({}^{2}a^{3} \to {}^{2}c^{0} \to {}^{1}b^{2}) \\
\delta &= ({}^{3}a^{4} \to {}^{5}a^{0} \to {}^{0}b^{1}) \\
\epsilon &= ({}^{4}a^{5})
\end{aligned}
$$

Markings

Fatgraph $G_{6,60}$ only has the identity automorphism, so the marked fatgraphs $G_{6,60}^{(0)}$ to $G_{6,60}^{(120)}$ are formed by decorating boundary cycles of $G_{6,60}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,61}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0]),      # a
  Vertex([4, 1, 2, 5, 5]),# b
  Vertex([4, 2, 3, 0]),   # c
])
```

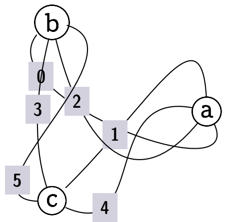
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}c^{0} \to {}^{0}b^{1}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}c^{3}) \\
\delta &= ({}^{4}b^{0} \to {}^{0}c^{1} \to {}^{2}b^{3}) \\
\epsilon &= ({}^{3}b^{4})
\end{aligned}$$

Markings

Fatgraph $G_{6,61}$ only has the identity automorphism, so the marked fatgraphs $G_{6,61}^{(0)}$ to $G_{6,61}^{(120)}$ are formed by decorating boundary cycles of $G_{6,61}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{6,62}$ (non-orientable, 20 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([0, 2, 5, 3]),# b
  Vertex([4, 1, 3, 5]),# c
])
```

Boundary cycles

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

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	c	b	4	2	1	5	0	3	γ	δ	α	β	ϵ
$A_2{}^{\ddagger}$	b	c	a	3	0	5	1	2	4	γ	β	ϵ	δ	α
$A_3{}^{\dagger\ddagger}$	b	a	c	2	5	0	4	3	1	ϵ	δ	γ	β	α
$A_4{}^{\dagger\ddagger}$	c	b	a	5	4	3	2	1	0	α	δ	ϵ	β	γ
$A_5{}^{\ddagger}$	c	a	b	1	3	4	0	5	2	ϵ	β	α	δ	γ

Markings

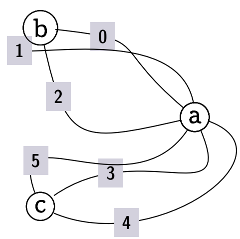
	$G_{6,62}^{(0)}$	$G_{6,62}^{(1)}$	$G_{6,62}^{(2)}$	$G_{6,62}^{(3)}$	$G_{6,62}^{(4)}$	$G_{6,62}^{(5)}$	$G_{6,62}^{(6)}$	$G_{6,62}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{6,62}^{(8)}$	$G_{6,62}^{(9)}$	$G_{6,62}^{(10)}$	$G_{6,62}^{(11)}$	$G_{6,62}^{(12)}$	$G_{6,62}^{(13)}$	$G_{6,62}^{(14)}$	$G_{6,62}^{(15)}$
α	0	0	0	0	1	1	1	1

(continued.)

β	2	2	3	3	0	0	0	0
γ	3	4	1	2	2	2	3	3
δ	4	3	4	4	3	4	2	4
ϵ	1	1	2	1	4	3	4	2

	$G^{(16)}_{6,62}$	$G^{(17)}_{6,62}$	$G^{(18)}_{6,62}$	$G^{(19)}_{6,62}$
α	1	1	2	2
β	0	0	0	0
γ	4	4	3	4
δ	2	3	1	1
ϵ	3	2	4	3

The Fatgraph $G_{6,63}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 5, 3, 4]),# a
  Vertex([1, 2, 0]),         # b
  Vertex([4, 3, 5]),         # c
])
```

Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{5}a^{0} \to {}^{2}c^{0})$$
$$\delta = ({}^{3}a^{4} \to {}^{1}c^{2})$$
$$\epsilon = ({}^{4}a^{5} \to {}^{0}c^{1})$$

Automorphisms

A_0	a	b	c	0	1	2	3	4	5	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	a	c	b	3	5	4	0	2	1	δ	ϵ	γ	α	β

Markings

	$G^{(0)}_{6,63}$	$G^{(1)}_{6,63}$	$G^{(2)}_{6,63}$	$G^{(3)}_{6,63}$	$G^{(4)}_{6,63}$	$G^{(5)}_{6,63}$	$G^{(6)}_{6,63}$	$G^{(7)}_{6,63}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

	$G^{(8)}_{6,63}$	$G^{(9)}_{6,63}$	$G^{(10)}_{6,63}$	$G^{(11)}_{6,63}$	$G^{(12)}_{6,63}$	$G^{(13)}_{6,63}$	$G^{(14)}_{6,63}$	$G^{(15)}_{6,63}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

	$G^{(16)}_{6,63}$	$G^{(17)}_{6,63}$	$G^{(18)}_{6,63}$	$G^{(19)}_{6,63}$	$G^{(20)}_{6,63}$	$G^{(21)}_{6,63}$	$G^{(22)}_{6,63}$	$G^{(23)}_{6,63}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1

	$G^{(24)}_{6,63}$	$G^{(25)}_{6,63}$	$G^{(26)}_{6,63}$	$G^{(27)}_{6,63}$	$G^{(28)}_{6,63}$	$G^{(29)}_{6,63}$	$G^{(30)}_{6,63}$	$G^{(31)}_{6,63}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

	$G^{(32)}_{6,63}$	$G^{(33)}_{6,63}$	$G^{(34)}_{6,63}$	$G^{(35)}_{6,63}$	$G^{(36)}_{6,63}$	$G^{(37)}_{6,63}$	$G^{(38)}_{6,63}$	$G^{(39)}_{6,63}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	4	3	2	4	4	2	2	3
ϵ	0	0	4	2	0	0	3	2

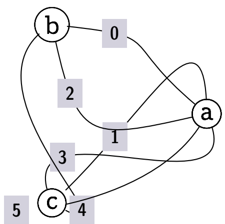
	$G^{(40)}_{6,63}$	$G^{(41)}_{6,63}$	$G^{(42)}_{6,63}$	$G^{(43)}_{6,63}$	$G^{(44)}_{6,63}$	$G^{(45)}_{6,63}$	$G^{(46)}_{6,63}$	$G^{(47)}_{6,63}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	3	2	3	4	4	3	3	4
ϵ	0	0	4	3	1	1	4	3

	$G^{(48)}_{6,63}$	$G^{(49)}_{6,63}$	$G^{(50)}_{6,63}$	$G^{(51)}_{6,63}$	$G^{(52)}_{6,63}$	$G^{(53)}_{6,63}$	$G^{(54)}_{6,63}$	$G^{(55)}_{6,63}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	4	3	4	4	3	3	4	4
ϵ	0	0	1	0	1	0	2	1

(continued.)

	$G_{6,63}^{(56)}$	$G_{6,63}^{(57)}$	$G_{6,63}^{(58)}$	$G_{6,63}^{(59)}$
α	3	3	3	3
β	1	1	2	2
γ	0	2	0	1
δ	4	4	4	4
ϵ	2	0	1	0

The Fatgraph $G_{6,64}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 5, 3]),# a
  Vertex([4, 2, 0]),      # b
  Vertex([4, 1, 3, 5]),   # c
])
```

Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{3}c^{0} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}c^{3} \to {}^{3}a^{4})$$
$$\epsilon = ({}^{1}c^{2} \to {}^{4}a^{0})$$

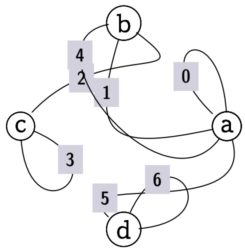
Markings

Fatgraph $G_{6,64}$ only has the identity automorphism, so the marked fatgraphs $G_{6,64}^{(0)}$ to $G_{6,64}^{(120)}$ are formed by decorating boundary cycles of $G_{6,64}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Fatgraphs with 7 edges / 4 vertices

There are 103 unmarked fatgraphs in this section, originating 22560 marked fatgraphs (11280 orientable, and 11280 nonorientable).

The Fatgraph $G_{7,0}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 4, 5]),# a
  Vertex([4, 1, 2]),      # b
  Vertex([3, 3, 2]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{2}d^{0} \to {}^{3}a^{4} \to {}^{4}a^{0} \to {}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{1}b^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,0}$ only has the identity automorphism, so the marked fatgraphs $G_{7,0}^{(0)}$ to $G_{7,0}^{(120)}$ are formed by decorating boundary cycles of $G_{7,0}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

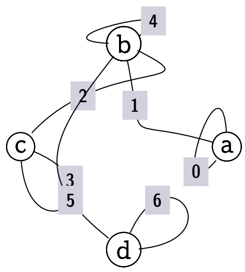
Differentials

$$D(G_{7,0}^{(0)}) = -G_{6,0}^{(4)}$$
$$D(G_{7,0}^{(1)}) = -G_{6,0}^{(2)}$$
$$D(G_{7,0}^{(2)}) = -G_{6,0}^{(5)}$$
$$D(G_{7,0}^{(3)}) = -G_{6,0}^{(0)}$$
$$D(G_{7,0}^{(4)}) = -G_{6,0}^{(3)}$$
$$D(G_{7,0}^{(5)}) = -G_{6,0}^{(1)}$$
$$D(G_{7,0}^{(6)}) = -G_{6,0}^{(10)}$$
$$D(G_{7,0}^{(7)}) = -G_{6,0}^{(8)}$$
$$D(G_{7,0}^{(8)}) = -G_{6,0}^{(11)}$$
$$D(G_{7,0}^{(9)}) = -G_{6,0}^{(6)}$$
$$D(G_{7,0}^{(10)}) = -G_{6,0}^{(9)}$$
$$D(G_{7,0}^{(11)}) = -G_{6,0}^{(7)}$$
$$D(G_{7,0}^{(12)}) = -G_{6,0}^{(16)}$$
$$D(G_{7,0}^{(13)}) = -G_{6,0}^{(14)}$$
$$D(G_{7,0}^{(14)}) = -G_{6,0}^{(17)}$$
$$D(G_{7,0}^{(15)}) = -G_{6,0}^{(12)}$$
$$D(G_{7,0}^{(16)}) = -G_{6,0}^{(15)}$$
$$D(G_{7,0}^{(17)}) = -G_{6,0}^{(13)}$$
$$D(G_{7,0}^{(18)}) = -G_{6,0}^{(22)}$$
$$D(G_{7,0}^{(19)}) = -G_{6,0}^{(20)}$$
$$D(G_{7,0}^{(20)}) = -G_{6,0}^{(23)}$$
$$D(G_{7,0}^{(21)}) = -G_{6,0}^{(18)}$$

$$D(G_{7,0}^{(22)}) = -G_{6,0}^{(21)}$$
$$D(G_{7,0}^{(23)}) = -G_{6,0}^{(19)}$$
$$D(G_{7,0}^{(24)}) = -G_{6,0}^{(28)}$$
$$D(G_{7,0}^{(25)}) = -G_{6,0}^{(26)}$$
$$D(G_{7,0}^{(26)}) = -G_{6,0}^{(29)}$$
$$D(G_{7,0}^{(27)}) = -G_{6,0}^{(24)}$$
$$D(G_{7,0}^{(28)}) = -G_{6,0}^{(27)}$$
$$D(G_{7,0}^{(29)}) = -G_{6,0}^{(25)}$$
$$D(G_{7,0}^{(30)}) = -G_{6,0}^{(8)}$$
$$D(G_{7,0}^{(31)}) = -G_{6,0}^{(10)}$$
$$D(G_{7,0}^{(32)}) = +G_{6,0}^{(7)}$$
$$D(G_{7,0}^{(33)}) = +G_{6,0}^{(9)}$$
$$D(G_{7,0}^{(34)}) = +G_{6,0}^{(6)}$$
$$D(G_{7,0}^{(35)}) = +G_{6,0}^{(11)}$$
$$D(G_{7,0}^{(36)}) = -G_{6,0}^{(14)}$$
$$D(G_{7,0}^{(37)}) = -G_{6,0}^{(16)}$$
$$D(G_{7,0}^{(38)}) = +G_{6,0}^{(13)}$$
$$D(G_{7,0}^{(39)}) = +G_{6,0}^{(15)}$$
$$D(G_{7,0}^{(40)}) = +G_{6,0}^{(12)}$$
$$D(G_{7,0}^{(41)}) = +G_{6,0}^{(17)}$$
$$D(G_{7,0}^{(42)}) = -G_{6,0}^{(20)}$$
$$D(G_{7,0}^{(43)}) = -G_{6,0}^{(22)}$$
$$D(G_{7,0}^{(44)}) = +G_{6,0}^{(19)}$$
$$D(G_{7,0}^{(45)}) = +G_{6,0}^{(21)}$$
$$D(G_{7,0}^{(46)}) = +G_{6,0}^{(18)}$$
$$D(G_{7,0}^{(47)}) = +G_{6,0}^{(23)}$$
$$D(G_{7,0}^{(48)}) = -G_{6,0}^{(26)}$$
$$D(G_{7,0}^{(49)}) = -G_{6,0}^{(28)}$$
$$D(G_{7,0}^{(50)}) = +G_{6,0}^{(25)}$$
$$D(G_{7,0}^{(51)}) = +G_{6,0}^{(27)}$$
$$D(G_{7,0}^{(52)}) = +G_{6,0}^{(24)}$$
$$D(G_{7,0}^{(53)}) = +G_{6,0}^{(29)}$$
$$D(G_{7,0}^{(54)}) = -G_{6,0}^{(2)}$$
$$D(G_{7,0}^{(55)}) = -G_{6,0}^{(4)}$$
$$D(G_{7,0}^{(56)}) = +G_{6,0}^{(1)}$$
$$D(G_{7,0}^{(57)}) = +G_{6,0}^{(3)}$$
$$D(G_{7,0}^{(58)}) = +G_{6,0}^{(0)}$$
$$D(G_{7,0}^{(59)}) = +G_{6,0}^{(5)}$$
$$D(G_{7,0}^{(60)}) = -G_{6,0}^{(12)}$$
$$D(G_{7,0}^{(61)}) = -G_{6,0}^{(17)}$$
$$D(G_{7,0}^{(62)}) = +G_{6,0}^{(15)}$$
$$D(G_{7,0}^{(63)}) = +G_{6,0}^{(13)}$$
$$D(G_{7,0}^{(64)}) = +G_{6,0}^{(14)}$$
$$D(G_{7,0}^{(65)}) = +G_{6,0}^{(16)}$$
$$D(G_{7,0}^{(66)}) = -G_{6,0}^{(18)}$$
$$D(G_{7,0}^{(67)}) = -G_{6,0}^{(23)}$$
$$D(G_{7,0}^{(68)}) = +G_{6,0}^{(21)}$$
$$D(G_{7,0}^{(69)}) = +G_{6,0}^{(19)}$$
$$D(G_{7,0}^{(70)}) = +G_{6,0}^{(20)}$$
$$D(G_{7,0}^{(71)}) = +G_{6,0}^{(22)}$$
$$D(G_{7,0}^{(72)}) = -G_{6,0}^{(24)}$$
$$D(G_{7,0}^{(73)}) = -G_{6,0}^{(29)}$$
$$D(G_{7,0}^{(74)}) = +G_{6,0}^{(27)}$$
$$D(G_{7,0}^{(75)}) = +G_{6,0}^{(25)}$$
$$D(G_{7,0}^{(76)}) = +G_{6,0}^{(26)}$$
$$D(G_{7,0}^{(77)}) = +G_{6,0}^{(28)}$$
$$D(G_{7,0}^{(78)}) = -G_{6,0}^{(0)}$$
$$D(G_{7,0}^{(79)}) = -G_{6,0}^{(5)}$$
$$D(G_{7,0}^{(80)}) = +G_{6,0}^{(3)}$$
$$D(G_{7,0}^{(81)}) = +G_{6,0}^{(1)}$$
$$D(G_{7,0}^{(82)}) = +G_{6,0}^{(2)}$$
$$D(G_{7,0}^{(83)}) = +G_{6,0}^{(4)}$$
$$D(G_{7,0}^{(84)}) = -G_{6,0}^{(6)}$$
$$D(G_{7,0}^{(85)}) = -G_{6,0}^{(11)}$$
$$D(G_{7,0}^{(86)}) = +G_{6,0}^{(9)}$$
$$D(G_{7,0}^{(87)}) = +G_{6,0}^{(7)}$$
$$D(G_{7,0}^{(88)}) = +G_{6,0}^{(8)}$$
$$D(G_{7,0}^{(89)}) = +G_{6,0}^{(10)}$$
$$D(G_{7,0}^{(90)}) = -G_{6,0}^{(19)}$$
$$D(G_{7,0}^{(91)}) = -G_{6,0}^{(21)}$$
$$D(G_{7,0}^{(92)}) = +G_{6,0}^{(23)}$$
$$D(G_{7,0}^{(93)}) = +G_{6,0}^{(18)}$$
$$D(G_{7,0}^{(94)}) = +G_{6,0}^{(22)}$$
$$D(G_{7,0}^{(95)}) = +G_{6,0}^{(20)}$$
$$D(G_{7,0}^{(96)}) = -G_{6,0}^{(25)}$$
$$D(G_{7,0}^{(97)}) = -G_{6,0}^{(27)}$$

$D(G^{(98)}_{7,0}) = +G^{(29)}_{6,0}$
$D(G^{(99)}_{7,0}) = +G^{(24)}_{6,0}$
$D(G^{(100)}_{7,0}) = +G^{(28)}_{6,0}$
$D(G^{(101)}_{7,0}) = +G^{(26)}_{6,0}$
$D(G^{(102)}_{7,0}) = -G^{(1)}_{6,0}$
$D(G^{(103)}_{7,0}) = -G^{(3)}_{6,0}$
$D(G^{(104)}_{7,0}) = +G^{(5)}_{6,0}$
$D(G^{(105)}_{7,0}) = +G^{(0)}_{6,0}$
$D(G^{(106)}_{7,0}) = +G^{(4)}_{6,0}$
$D(G^{(107)}_{7,0}) = +G^{(2)}_{6,0}$
$D(G^{(108)}_{7,0}) = -G^{(7)}_{6,0}$
$D(G^{(109)}_{7,0}) = -G^{(9)}_{6,0}$
$D(G^{(110)}_{7,0}) = +G^{(11)}_{6,0}$
$D(G^{(111)}_{7,0}) = +G^{(6)}_{6,0}$
$D(G^{(112)}_{7,0}) = +G^{(10)}_{6,0}$
$D(G^{(113)}_{7,0}) = +G^{(8)}_{6,0}$
$D(G^{(114)}_{7,0}) = -G^{(13)}_{6,0}$
$D(G^{(115)}_{7,0}) = -G^{(15)}_{6,0}$
$D(G^{(116)}_{7,0}) = +G^{(17)}_{6,0}$
$D(G^{(117)}_{7,0}) = +G^{(12)}_{6,0}$
$D(G^{(118)}_{7,0}) = +G^{(16)}_{6,0}$
$D(G^{(119)}_{7,0}) = +G^{(14)}_{6,0}$

The Fatgraph $G_{7,1}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),      # a
  Vertex([4, 5, 1, 2, 4]),# b
  Vertex([3, 3, 2]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

$\alpha = ({}^2d^0 \to {}^2b^3 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^1c^2 \to {}^3b^4 \to {}^2c^0 \to {}^1d^2 \to {}^1b^2)$
$\beta = ({}^2a^0)$
$\gamma = ({}^4b^0)$
$\delta = ({}^0c^1)$
$\epsilon = ({}^0d^1)$

Markings

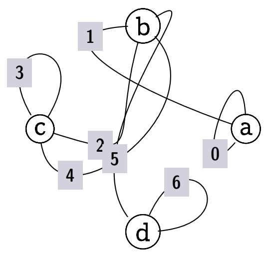
Fatgraph $G_{7,1}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,1}$ to $G^{(120)}_{7,1}$ are formed by decorating boundary cycles of $G_{7,1}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{7,1}^{(0)}) = -G_{6,0}^{(1)} - G_{6,0}^{(4)}$$
$$D(G_{7,1}^{(1)}) = -G_{6,0}^{(0)} - G_{6,0}^{(2)}$$
$$D(G_{7,1}^{(2)}) = -G_{6,0}^{(3)} - G_{6,0}^{(5)}$$
$$D(G_{7,1}^{(3)}) = -G_{6,0}^{(0)} - G_{6,0}^{(2)}$$
$$D(G_{7,1}^{(4)}) = -G_{6,0}^{(3)} - G_{6,0}^{(5)}$$
$$D(G_{7,1}^{(5)}) = -G_{6,0}^{(1)} - G_{6,0}^{(4)}$$
$$D(G_{7,1}^{(6)}) = -G_{6,0}^{(7)} - G_{6,0}^{(10)}$$
$$D(G_{7,1}^{(7)}) = -G_{6,0}^{(6)} - G_{6,0}^{(8)}$$
$$D(G_{7,1}^{(8)}) = -G_{6,0}^{(9)} - G_{6,0}^{(11)}$$
$$D(G_{7,1}^{(9)}) = -G_{6,0}^{(6)} - G_{6,0}^{(8)}$$
$$D(G_{7,1}^{(10)}) = -G_{6,0}^{(9)} - G_{6,0}^{(11)}$$
$$D(G_{7,1}^{(11)}) = -G_{6,0}^{(7)} - G_{6,0}^{(10)}$$
$$D(G_{7,1}^{(12)}) = -G_{6,0}^{(13)} - G_{6,0}^{(16)}$$
$$D(G_{7,1}^{(13)}) = -G_{6,0}^{(12)} - G_{6,0}^{(14)}$$
$$D(G_{7,1}^{(14)}) = -G_{6,0}^{(15)} - G_{6,0}^{(17)}$$
$$D(G_{7,1}^{(15)}) = -G_{6,0}^{(12)} - G_{6,0}^{(14)}$$
$$D(G_{7,1}^{(16)}) = -G_{6,0}^{(15)} - G_{6,0}^{(17)}$$
$$D(G_{7,1}^{(17)}) = -G_{6,0}^{(13)} - G_{6,0}^{(16)}$$
$$D(G_{7,1}^{(18)}) = -G_{6,0}^{(19)} - G_{6,0}^{(22)}$$
$$D(G_{7,1}^{(19)}) = -G_{6,0}^{(18)} - G_{6,0}^{(20)}$$
$$D(G_{7,1}^{(20)}) = -G_{6,0}^{(21)} - G_{6,0}^{(23)}$$
$$D(G_{7,1}^{(21)}) = -G_{6,0}^{(18)} - G_{6,0}^{(20)}$$
$$D(G_{7,1}^{(22)}) = -G_{6,0}^{(21)} - G_{6,0}^{(23)}$$
$$D(G_{7,1}^{(23)}) = -G_{6,0}^{(19)} - G_{6,0}^{(22)}$$
$$D(G_{7,1}^{(24)}) = -G_{6,0}^{(25)} - G_{6,0}^{(28)}$$
$$D(G_{7,1}^{(25)}) = -G_{6,0}^{(24)} - G_{6,0}^{(26)}$$
$$D(G_{7,1}^{(26)}) = -G_{6,0}^{(27)} - G_{6,0}^{(29)}$$
$$D(G_{7,1}^{(27)}) = -G_{6,0}^{(24)} - G_{6,0}^{(26)}$$
$$D(G_{7,1}^{(28)}) = -G_{6,0}^{(27)} - G_{6,0}^{(29)}$$
$$D(G_{7,1}^{(29)}) = -G_{6,0}^{(25)} - G_{6,0}^{(28)}$$
$$D(G_{7,1}^{(30)}) = -G_{6,0}^{(8)} + G_{6,0}^{(11)}$$
$$D(G_{7,1}^{(31)}) = +G_{6,0}^{(9)} - G_{6,0}^{(10)}$$
$$D(G_{7,1}^{(32)}) = +G_{6,0}^{(6)} + G_{6,0}^{(7)}$$
$$D(G_{7,1}^{(33)}) = +G_{6,0}^{(9)} - G_{6,0}^{(10)}$$
$$D(G_{7,1}^{(34)}) = +G_{6,0}^{(6)} + G_{6,0}^{(7)}$$
$$D(G_{7,1}^{(35)}) = -G_{6,0}^{(8)} + G_{6,0}^{(11)}$$
$$D(G_{7,1}^{(36)}) = -G_{6,0}^{(14)} + G_{6,0}^{(17)}$$
$$D(G_{7,1}^{(37)}) = +G_{6,0}^{(15)} - G_{6,0}^{(16)}$$
$$D(G_{7,1}^{(38)}) = +G_{6,0}^{(12)} + G_{6,0}^{(13)}$$
$$D(G_{7,1}^{(39)}) = +G_{6,0}^{(15)} - G_{6,0}^{(16)}$$
$$D(G_{7,1}^{(40)}) = +G_{6,0}^{(12)} + G_{6,0}^{(13)}$$
$$D(G_{7,1}^{(41)}) = -G_{6,0}^{(14)} + G_{6,0}^{(17)}$$
$$D(G_{7,1}^{(42)}) = -G_{6,0}^{(20)} + G_{6,0}^{(23)}$$
$$D(G_{7,1}^{(43)}) = +G_{6,0}^{(21)} - G_{6,0}^{(22)}$$
$$D(G_{7,1}^{(44)}) = +G_{6,0}^{(18)} + G_{6,0}^{(19)}$$
$$D(G_{7,1}^{(45)}) = +G_{6,0}^{(21)} - G_{6,0}^{(22)}$$
$$D(G_{7,1}^{(46)}) = +G_{6,0}^{(18)} + G_{6,0}^{(19)}$$
$$D(G_{7,1}^{(47)}) = -G_{6,0}^{(20)} + G_{6,0}^{(23)}$$
$$D(G_{7,1}^{(48)}) = -G_{6,0}^{(26)} + G_{6,0}^{(29)}$$
$$D(G_{7,1}^{(49)}) = +G_{6,0}^{(27)} - G_{6,0}^{(28)}$$
$$D(G_{7,1}^{(50)}) = +G_{6,0}^{(24)} + G_{6,0}^{(25)}$$
$$D(G_{7,1}^{(51)}) = +G_{6,0}^{(27)} - G_{6,0}^{(28)}$$
$$D(G_{7,1}^{(52)}) = +G_{6,0}^{(24)} + G_{6,0}^{(25)}$$
$$D(G_{7,1}^{(53)}) = -G_{6,0}^{(26)} + G_{6,0}^{(29)}$$
$$D(G_{7,1}^{(54)}) = -G_{6,0}^{(2)} + G_{6,0}^{(5)}$$
$$D(G_{7,1}^{(55)}) = +G_{6,0}^{(3)} - G_{6,0}^{(4)}$$
$$D(G_{7,1}^{(56)}) = +G_{6,0}^{(0)} + G_{6,0}^{(1)}$$
$$D(G_{7,1}^{(57)}) = +G_{6,0}^{(3)} - G_{6,0}^{(4)}$$
$$D(G_{7,1}^{(58)}) = +G_{6,0}^{(0)} + G_{6,0}^{(1)}$$
$$D(G_{7,1}^{(59)}) = -G_{6,0}^{(2)} + G_{6,0}^{(5)}$$
$$D(G_{7,1}^{(60)}) = -G_{6,0}^{(12)} + G_{6,0}^{(16)}$$
$$D(G_{7,1}^{(61)}) = +G_{6,0}^{(13)} - G_{6,0}^{(17)}$$
$$D(G_{7,1}^{(62)}) = +G_{6,0}^{(14)} + G_{6,0}^{(15)}$$
$$D(G_{7,1}^{(63)}) = +G_{6,0}^{(13)} - G_{6,0}^{(17)}$$
$$D(G_{7,1}^{(64)}) = +G_{6,0}^{(14)} + G_{6,0}^{(15)}$$
$$D(G_{7,1}^{(65)}) = -G_{6,0}^{(12)} + G_{6,0}^{(16)}$$
$$D(G_{7,1}^{(66)}) = -G_{6,0}^{(18)} + G_{6,0}^{(22)}$$
$$D(G_{7,1}^{(67)}) = +G_{6,0}^{(19)} - G_{6,0}^{(23)}$$
$$D(G_{7,1}^{(68)}) = +G_{6,0}^{(20)} + G_{6,0}^{(21)}$$
$$D(G_{7,1}^{(69)}) = +G_{6,0}^{(19)} - G_{6,0}^{(23)}$$
$$D(G_{7,1}^{(70)}) = +G_{6,0}^{(20)} + G_{6,0}^{(21)}$$
$$D(G_{7,1}^{(71)}) = -G_{6,0}^{(18)} + G_{6,0}^{(22)}$$
$$D(G_{7,1}^{(72)}) = -G_{6,0}^{(24)} + G_{6,0}^{(28)}$$
$$D(G_{7,1}^{(73)}) = +G_{6,0}^{(25)} - G_{6,0}^{(29)}$$

$D(G_{7,1}^{(74)}) = +G_{6,0}^{(26)} + G_{6,0}^{(27)}$
$D(G_{7,1}^{(75)}) = +G_{6,0}^{(25)} - G_{6,0}^{(29)}$
$D(G_{7,1}^{(76)}) = +G_{6,0}^{(26)} + G_{6,0}^{(27)}$
$D(G_{7,1}^{(77)}) = -G_{6,0}^{(24)} + G_{6,0}^{(28)}$
$D(G_{7,1}^{(78)}) = -G_{6,0}^{(0)} + G_{6,0}^{(4)}$
$D(G_{7,1}^{(79)}) = +G_{6,0}^{(1)} - G_{6,0}^{(5)}$
$D(G_{7,1}^{(80)}) = +G_{6,0}^{(2)} + G_{6,0}^{(3)}$
$D(G_{7,1}^{(81)}) = +G_{6,0}^{(1)} - G_{6,0}^{(5)}$
$D(G_{7,1}^{(82)}) = +G_{6,0}^{(2)} + G_{6,0}^{(3)}$
$D(G_{7,1}^{(83)}) = -G_{6,0}^{(0)} + G_{6,0}^{(4)}$
$D(G_{7,1}^{(84)}) = -G_{6,0}^{(6)} + G_{6,0}^{(10)}$
$D(G_{7,1}^{(85)}) = +G_{6,0}^{(7)} - G_{6,0}^{(11)}$
$D(G_{7,1}^{(86)}) = +G_{6,0}^{(8)} + G_{6,0}^{(9)}$
$D(G_{7,1}^{(87)}) = +G_{6,0}^{(7)} - G_{6,0}^{(11)}$
$D(G_{7,1}^{(88)}) = +G_{6,0}^{(8)} + G_{6,0}^{(9)}$
$D(G_{7,1}^{(89)}) = -G_{6,0}^{(6)} + G_{6,0}^{(10)}$
$D(G_{7,1}^{(90)}) = -G_{6,0}^{(19)} + G_{6,0}^{(20)}$
$D(G_{7,1}^{(91)}) = +G_{6,0}^{(18)} - G_{6,0}^{(21)}$
$D(G_{7,1}^{(92)}) = +G_{6,0}^{(22)} + G_{6,0}^{(23)}$
$D(G_{7,1}^{(93)}) = +G_{6,0}^{(18)} - G_{6,0}^{(21)}$
$D(G_{7,1}^{(94)}) = +G_{6,0}^{(22)} + G_{6,0}^{(23)}$
$D(G_{7,1}^{(95)}) = -G_{6,0}^{(19)} + G_{6,0}^{(20)}$
$D(G_{7,1}^{(96)}) = -G_{6,0}^{(25)} + G_{6,0}^{(26)}$
$D(G_{7,1}^{(97)}) = +G_{6,0}^{(24)} - G_{6,0}^{(27)}$
$D(G_{7,1}^{(98)}) = +G_{6,0}^{(28)} + G_{6,0}^{(29)}$
$D(G_{7,1}^{(99)}) = +G_{6,0}^{(24)} - G_{6,0}^{(27)}$
$D(G_{7,1}^{(100)}) = +G_{6,0}^{(28)} + G_{6,0}^{(29)}$
$D(G_{7,1}^{(101)}) = -G_{6,0}^{(25)} + G_{6,0}^{(26)}$
$D(G_{7,1}^{(102)}) = -G_{6,0}^{(1)} + G_{6,0}^{(2)}$
$D(G_{7,1}^{(103)}) = +G_{6,0}^{(0)} - G_{6,0}^{(3)}$
$D(G_{7,1}^{(104)}) = +G_{6,0}^{(4)} + G_{6,0}^{(5)}$
$D(G_{7,1}^{(105)}) = +G_{6,0}^{(0)} - G_{6,0}^{(3)}$
$D(G_{7,1}^{(106)}) = +G_{6,0}^{(4)} + G_{6,0}^{(5)}$
$D(G_{7,1}^{(107)}) = -G_{6,0}^{(1)} + G_{6,0}^{(2)}$
$D(G_{7,1}^{(108)}) = -G_{6,0}^{(7)} + G_{6,0}^{(8)}$
$D(G_{7,1}^{(109)}) = +G_{6,0}^{(6)} - G_{6,0}^{(9)}$
$D(G_{7,1}^{(110)}) = +G_{6,0}^{(10)} + G_{6,0}^{(11)}$
$D(G_{7,1}^{(111)}) = +G_{6,0}^{(6)} - G_{6,0}^{(9)}$
$D(G_{7,1}^{(112)}) = +G_{6,0}^{(10)} + G_{6,0}^{(11)}$
$D(G_{7,1}^{(113)}) = -G_{6,0}^{(7)} + G_{6,0}^{(8)}$
$D(G_{7,1}^{(114)}) = -G_{6,0}^{(13)} + G_{6,0}^{(14)}$
$D(G_{7,1}^{(115)}) = +G_{6,0}^{(12)} - G_{6,0}^{(15)}$
$D(G_{7,1}^{(116)}) = +G_{6,0}^{(16)} + G_{6,0}^{(17)}$
$D(G_{7,1}^{(117)}) = +G_{6,0}^{(12)} - G_{6,0}^{(15)}$
$D(G_{7,1}^{(118)}) = +G_{6,0}^{(16)} + G_{6,0}^{(17)}$
$D(G_{7,1}^{(119)}) = -G_{6,0}^{(13)} + G_{6,0}^{(14)}$

The Fatgraph $G_{7,2}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),   # a
  Vertex([1, 2, 4, 5]),# b
  Vertex([4, 2, 3, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^3c^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0d^1)$$

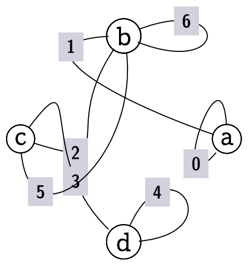
Markings

Fatgraph $G_{7,2}$ only has the identity automorphism, so the marked fatgraphs $G_{7,2}^{(0)}$ to $G_{7,2}^{(120)}$ are formed by decorating boundary cycles of $G_{7,2}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$D(G_{7,2}^{(0)}) = -G_{6,1}^{(62)}$
$D(G_{7,2}^{(1)}) = -G_{6,1}^{(64)}$
$D(G_{7,2}^{(24)}) = -G_{6,0}^{(38)}$
$D(G_{7,2}^{(25)}) = -G_{6,0}^{(40)}$
$D(G_{7,2}^{(26)}) = -G_{6,0}^{(44)}$
$D(G_{7,2}^{(27)}) = -G_{6,0}^{(46)}$
$D(G_{7,2}^{(28)}) = -G_{6,0}^{(50)}$
$D(G_{7,2}^{(29)}) = -G_{6,0}^{(52)}$
$D(G_{7,2}^{(48)}) = -G_{6,0}^{(32)}$
$D(G_{7,2}^{(49)}) = -G_{6,0}^{(34)}$
$D(G_{7,2}^{(50)}) = -G_{6,0}^{(42)}$
$D(G_{7,2}^{(51)}) = -G_{6,0}^{(47)}$
$D(G_{7,2}^{(52)}) = -G_{6,0}^{(48)}$
$D(G_{7,2}^{(53)}) = -G_{6,0}^{(53)}$
$D(G_{7,2}^{(54)}) = -G_{6,0}^{(56)}$
$D(G_{7,2}^{(55)}) = -G_{6,0}^{(58)}$
$D(G_{7,2}^{(72)}) = -G_{6,0}^{(30)}$
$D(G_{7,2}^{(73)}) = -G_{6,0}^{(35)}$
$D(G_{7,2}^{(74)}) = -G_{6,0}^{(36)}$
$D(G_{7,2}^{(75)}) = -G_{6,0}^{(41)}$
$D(G_{7,2}^{(76)}) = -G_{6,0}^{(49)}$
$D(G_{7,2}^{(77)}) = -G_{6,0}^{(51)}$
$D(G_{7,2}^{(78)}) = -G_{6,0}^{(54)}$
$D(G_{7,2}^{(79)}) = -G_{6,0}^{(59)}$
$D(G_{7,2}^{(80)}) = -G_{6,0}^{(60)}$
$D(G_{7,2}^{(96)}) = -G_{6,0}^{(31)}$
$D(G_{7,2}^{(97)}) = -G_{6,0}^{(33)}$
$D(G_{7,2}^{(98)}) = -G_{6,0}^{(37)}$
$D(G_{7,2}^{(99)}) = -G_{6,0}^{(39)}$
$D(G_{7,2}^{(100)}) = -G_{6,0}^{(43)}$
$D(G_{7,2}^{(101)}) = -G_{6,0}^{(45)}$
$D(G_{7,2}^{(102)}) = -G_{6,0}^{(55)}$
$D(G_{7,2}^{(103)}) = -G_{6,0}^{(57)}$
$D(G_{7,2}^{(104)}) = -G_{6,1}^{(61)}$
$D(G_{7,2}^{(105)}) = -G_{6,1}^{(63)}$

The Fatgraph $G_{7,3}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),      # a
  Vertex([1, 2, 5, 6, 6]),# b
  Vertex([5, 2, 3]),      # c
  Vertex([4, 4, 3]),      # d
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^2b^3 \to {}^4b^0 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

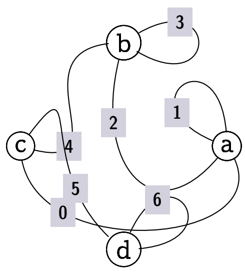
Fatgraph $G_{7,3}$ only has the identity automorphism, so the marked fatgraphs $G_{7,3}^{(0)}$ to $G_{7,3}^{(120)}$ are formed by decorating boundary cycles of $G_{7,3}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{7,3}^{(0)}) = -G_{6,0}^{(34)}$$
$$D(G_{7,3}^{(1)}) = -G_{6,0}^{(32)}$$
$$D(G_{7,3}^{(2)}) = -G_{6,0}^{(35)}$$
$$D(G_{7,3}^{(3)}) = -G_{6,0}^{(30)}$$
$$D(G_{7,3}^{(4)}) = -G_{6,0}^{(33)}$$
$$D(G_{7,3}^{(5)}) = -G_{6,0}^{(31)}$$
$$D(G_{7,3}^{(6)}) = -G_{6,0}^{(40)}$$
$$D(G_{7,3}^{(7)}) = -G_{6,0}^{(38)}$$
$$D(G_{7,3}^{(8)}) = -G_{6,0}^{(41)}$$
$$D(G_{7,3}^{(9)}) = -G_{6,0}^{(36)}$$
$$D(G_{7,3}^{(10)}) = -G_{6,0}^{(39)}$$
$$D(G_{7,3}^{(11)}) = -G_{6,0}^{(37)}$$
$$D(G_{7,3}^{(12)}) = -G_{6,0}^{(46)}$$
$$D(G_{7,3}^{(13)}) = -G_{6,0}^{(44)}$$
$$D(G_{7,3}^{(14)}) = -G_{6,0}^{(47)}$$
$$D(G_{7,3}^{(15)}) = -G_{6,0}^{(42)}$$
$$D(G_{7,3}^{(16)}) = -G_{6,0}^{(45)}$$
$$D(G_{7,3}^{(17)}) = -G_{6,0}^{(43)}$$
$$D(G_{7,3}^{(18)}) = -G_{6,0}^{(52)}$$
$$D(G_{7,3}^{(19)}) = -G_{6,0}^{(50)}$$
$$D(G_{7,3}^{(20)}) = -G_{6,0}^{(53)}$$
$$D(G_{7,3}^{(21)}) = -G_{6,0}^{(48)}$$

$D(G_{7,3}^{(22)}) = -G_{6,0}^{(51)}$
$D(G_{7,3}^{(23)}) = -G_{6,0}^{(49)}$
$D(G_{7,3}^{(24)}) = -G_{6,0}^{(58)}$
$D(G_{7,3}^{(25)}) = -G_{6,0}^{(56)}$
$D(G_{7,3}^{(26)}) = -G_{6,0}^{(59)}$
$D(G_{7,3}^{(27)}) = -G_{6,0}^{(54)}$
$D(G_{7,3}^{(28)}) = -G_{6,0}^{(57)}$
$D(G_{7,3}^{(29)}) = -G_{6,0}^{(55)}$
$D(G_{7,3}^{(30)}) = -G_{6,1}^{(64)}$
$D(G_{7,3}^{(31)}) = -G_{6,1}^{(62)}$
$D(G_{7,3}^{(33)}) = -G_{6,0}^{(60)}$
$D(G_{7,3}^{(34)}) = -G_{6,1}^{(63)}$
$D(G_{7,3}^{(35)}) = -G_{6,1}^{(61)}$

The Fatgraph $G_{7,4}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([4, 2, 3, 3]),# b
  Vertex([0, 4, 5]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{1}b^{2} \to {}^{3}a^{0} \to {}^{3}b^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}b^{3})$$
$$\epsilon = ({}^{0}d^{1})$$

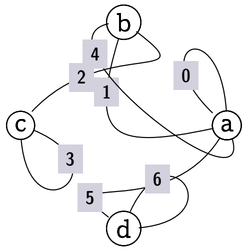
Markings

Fatgraph $G_{7,4}$ only has the identity automorphism, so the marked fatgraphs $G_{7,4}^{(0)}$ to $G_{7,4}^{(120)}$ are formed by decorating boundary cycles of $G_{7,4}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$D(G_{7,4}^{(0)}) = -G_{6,0}^{(34)} - G_{6,0}^{(48)}$
$D(G_{7,4}^{(1)}) = -G_{6,0}^{(32)} - G_{6,0}^{(42)}$
$D(G_{7,4}^{(2)}) = -G_{6,0}^{(35)} - G_{6,0}^{(49)}$
$D(G_{7,4}^{(3)}) = -G_{6,0}^{(30)} - G_{6,0}^{(36)}$
$D(G_{7,4}^{(4)}) = -G_{6,0}^{(33)} - G_{6,0}^{(43)}$
$D(G_{7,4}^{(5)}) = -G_{6,0}^{(31)} - G_{6,0}^{(37)}$
$D(G_{7,4}^{(6)}) = -G_{6,0}^{(40)} - G_{6,0}^{(50)}$
$D(G_{7,4}^{(7)}) = -G_{6,0}^{(38)} - G_{6,0}^{(44)}$
$D(G_{7,4}^{(8)}) = -G_{6,0}^{(41)} - G_{6,0}^{(51)}$
$D(G_{7,4}^{(9)}) = -G_{6,0}^{(30)} - G_{6,0}^{(36)}$
$D(G_{7,4}^{(10)}) = -G_{6,0}^{(39)} - G_{6,0}^{(45)}$
$D(G_{7,4}^{(11)}) = -G_{6,0}^{(31)} - G_{6,0}^{(37)}$
$D(G_{7,4}^{(12)}) = -G_{6,0}^{(46)} - G_{6,0}^{(52)}$
$D(G_{7,4}^{(13)}) = -G_{6,0}^{(38)} - G_{6,0}^{(44)}$
$D(G_{7,4}^{(14)}) = -G_{6,0}^{(47)} - G_{6,0}^{(53)}$
$D(G_{7,4}^{(15)}) = -G_{6,0}^{(32)} - G_{6,0}^{(42)}$
$D(G_{7,4}^{(16)}) = -G_{6,0}^{(39)} - G_{6,0}^{(45)}$
$D(G_{7,4}^{(17)}) = -G_{6,0}^{(33)} - G_{6,0}^{(43)}$
$D(G_{7,4}^{(18)}) = -G_{6,0}^{(46)} - G_{6,0}^{(52)}$
$D(G_{7,4}^{(19)}) = -G_{6,0}^{(40)} - G_{6,0}^{(50)}$
$D(G_{7,4}^{(20)}) = -G_{6,0}^{(47)} - G_{6,0}^{(53)}$
$D(G_{7,4}^{(21)}) = -G_{6,0}^{(34)} - G_{6,0}^{(48)}$
$D(G_{7,4}^{(22)}) = -G_{6,0}^{(41)} - G_{6,0}^{(51)}$
$D(G_{7,4}^{(23)}) = -G_{6,0}^{(35)} - G_{6,0}^{(49)}$
$D(G_{7,4}^{(24)}) = -G_{6,0}^{(58)}$
$D(G_{7,4}^{(25)}) = -G_{6,0}^{(56)}$
$D(G_{7,4}^{(26)}) = -G_{6,0}^{(59)}$
$D(G_{7,4}^{(27)}) = -G_{6,0}^{(54)} - G_{6,0}^{(60)}$
$D(G_{7,4}^{(28)}) = -G_{6,0}^{(57)}$
$D(G_{7,4}^{(29)}) = -G_{6,0}^{(55)} - G_{6,1}^{(61)}$
$D(G_{7,4}^{(30)}) = -G_{6,1}^{(64)}$
$D(G_{7,4}^{(31)}) = -G_{6,1}^{(62)}$
$D(G_{7,4}^{(33)}) = -G_{6,0}^{(54)} - G_{6,0}^{(60)}$
$D(G_{7,4}^{(34)}) = -G_{6,1}^{(63)}$
$D(G_{7,4}^{(35)}) = -G_{6,0}^{(55)} - G_{6,1}^{(61)}$
$D(G_{7,4}^{(37)}) = -G_{6,1}^{(62)}$
$D(G_{7,4}^{(39)}) = -G_{6,0}^{(56)}$
$D(G_{7,4}^{(40)}) = -G_{6,1}^{(63)}$
$D(G_{7,4}^{(41)}) = -G_{6,0}^{(57)}$
$D(G_{7,4}^{(43)}) = -G_{6,1}^{(64)}$
$D(G_{7,4}^{(45)}) = -G_{6,0}^{(58)}$
$D(G_{7,4}^{(47)}) = -G_{6,0}^{(59)}$

The Fatgraph $G_{7,5}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 0, 1, 5, 4]),# a
  Vertex([4, 1, 2]),      # b
  Vertex([3, 3, 2]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{4}a^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{2}d^{0} \to {}^{3}a^{4} \to {}^{1}d^{2} \to {}^{0}b^{1})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

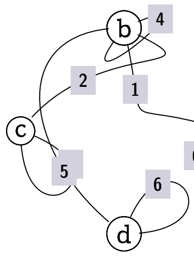
Markings

Fatgraph $G_{7,5}$ only has the identity automorphism, so the marked fatgraphs $G_{7,5}^{(0)}$ to $G_{7,5}^{(120)}$ are formed by decorating boundary cycles of $G_{7,5}$ with all permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$D(G_{7,5}^{(0)}) = +G_{6,0}^{(48)}$
$D(G_{7,5}^{(1)}) = +G_{6,0}^{(42)}$
$D(G_{7,5}^{(2)}) = +G_{6,0}^{(49)}$
$D(G_{7,5}^{(3)}) = +G_{6,0}^{(36)}$
$D(G_{7,5}^{(4)}) = +G_{6,0}^{(43)}$
$D(G_{7,5}^{(5)}) = +G_{6,0}^{(37)}$
$D(G_{7,5}^{(6)}) = +G_{6,0}^{(50)}$
$D(G_{7,5}^{(7)}) = +G_{6,0}^{(44)}$
$D(G_{7,5}^{(8)}) = +G_{6,0}^{(51)}$
$D(G_{7,5}^{(9)}) = +G_{6,0}^{(30)}$
$D(G_{7,5}^{(10)}) = +G_{6,0}^{(45)}$
$D(G_{7,5}^{(11)}) = +G_{6,0}^{(31)}$
$D(G_{7,5}^{(12)}) = +G_{6,0}^{(52)}$
$D(G_{7,5}^{(13)}) = +G_{6,0}^{(38)}$
$D(G_{7,5}^{(14)}) = +G_{6,0}^{(53)}$
$D(G_{7,5}^{(15)}) = +G_{6,0}^{(32)}$
$D(G_{7,5}^{(16)}) = +G_{6,0}^{(39)}$
$D(G_{7,5}^{(17)}) = +G_{6,0}^{(33)}$
$D(G_{7,5}^{(18)}) = +G_{6,0}^{(46)}$
$D(G_{7,5}^{(19)}) = +G_{6,0}^{(40)}$
$D(G_{7,5}^{(20)}) = +G_{6,0}^{(47)}$
$D(G_{7,5}^{(21)}) = +G_{6,0}^{(34)}$
$D(G_{7,5}^{(22)}) = +G_{6,0}^{(41)}$
$D(G_{7,5}^{(23)}) = +G_{6,0}^{(35)}$
$D(G_{7,5}^{(27)}) = +G_{6,0}^{(60)}$
$D(G_{7,5}^{(29)}) = +G_{6,1}^{(61)}$
$D(G_{7,5}^{(33)}) = +G_{6,0}^{(54)}$
$D(G_{7,5}^{(35)}) = +G_{6,0}^{(55)}$
$D(G_{7,5}^{(37)}) = +G_{6,1}^{(62)}$
$D(G_{7,5}^{(39)}) = +G_{6,0}^{(56)}$
$D(G_{7,5}^{(40)}) = +G_{6,1}^{(63)}$
$D(G_{7,5}^{(41)}) = +G_{6,0}^{(57)}$
$D(G_{7,5}^{(43)}) = +G_{6,1}^{(64)}$
$D(G_{7,5}^{(45)}) = +G_{6,0}^{(58)}$
$D(G_{7,5}^{(47)}) = +G_{6,0}^{(59)}$

The Fatgraph $G_{7,6}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),      # a
  Vertex([5, 4, 1, 2, 4]),# b
  Vertex([3, 3, 2]),      # c
  Vertex([6, 6, 5]),      # d
])
```

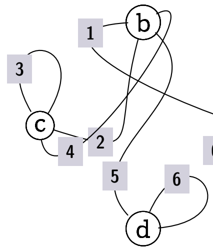
Boundary cycles

$$\alpha = ({}^2b^3 \to {}^1a^2 \to {}^0a^1 \to {}^1b^2 \to {}^1c^2 \to {}^3b^4 \to {}^2c^0)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^2d^0 \to {}^4b^0 \to {}^1d^2 \to {}^0b^1)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,6}$ only has the identity automorphism, so the marked fatgraphs $G_{7,6}^{(0)}$ to $G_{7,6}^{(120)}$ are formed by decorating boundary cycles of $G_{7,6}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,7}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),   # a
  Vertex([1, 2, 5, 4]),# b
  Vertex([4, 2, 3, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^3b^0 \to {}^3c^0)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^2d^0 \to {}^2b^3 \to {}^1d^2 \to {}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0d^1)$$

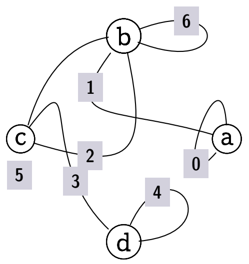
Markings

Fatgraph $G_{7,7}$ only has the identity automorphism, so the marked fatgraphs $G_{7,7}^{(0)}$ to $G_{7,7}^{(120)}$ are formed by decorating boundary cycles of $G_{7,7}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{7,7}^{(0)}) = +G_{6,0}^{(46)}$$
$$D(G_{7,7}^{(1)}) = +G_{6,0}^{(52)}$$
$$D(G_{7,7}^{(2)}) = +G_{6,0}^{(40)}$$
$$D(G_{7,7}^{(3)}) = +G_{6,0}^{(50)}$$
$$D(G_{7,7}^{(4)}) = +G_{6,0}^{(38)}$$
$$D(G_{7,7}^{(5)}) = +G_{6,0}^{(44)}$$
$$D(G_{7,7}^{(6)}) = +G_{6,0}^{(47)}$$
$$D(G_{7,7}^{(7)}) = +G_{6,0}^{(53)}$$
$$D(G_{7,7}^{(8)}) = +G_{6,0}^{(34)}$$
$$D(G_{7,7}^{(9)}) = +G_{6,0}^{(48)}$$
$$D(G_{7,7}^{(10)}) = +G_{6,0}^{(32)}$$
$$D(G_{7,7}^{(11)}) = +G_{6,0}^{(42)}$$
$$D(G_{7,7}^{(12)}) = +G_{6,0}^{(41)}$$
$$D(G_{7,7}^{(13)}) = +G_{6,0}^{(51)}$$
$$D(G_{7,7}^{(14)}) = +G_{6,0}^{(35)}$$
$$D(G_{7,7}^{(15)}) = +G_{6,0}^{(49)}$$
$$D(G_{7,7}^{(16)}) = +G_{6,0}^{(30)}$$
$$D(G_{7,7}^{(17)}) = +G_{6,0}^{(36)}$$
$$D(G_{7,7}^{(18)}) = +G_{6,0}^{(39)}$$
$$D(G_{7,7}^{(19)}) = +G_{6,0}^{(45)}$$
$$D(G_{7,7}^{(20)}) = +G_{6,0}^{(33)}$$
$$D(G_{7,7}^{(21)}) = +G_{6,0}^{(43)}$$
$$D(G_{7,7}^{(22)}) = +G_{6,0}^{(31)}$$
$$D(G_{7,7}^{(23)}) = +G_{6,0}^{(37)}$$
$$D(G_{7,7}^{(26)}) = +G_{6,1}^{(64)}$$
$$D(G_{7,7}^{(28)}) = +G_{6,1}^{(62)}$$
$$D(G_{7,7}^{(32)}) = +G_{6,0}^{(58)}$$
$$D(G_{7,7}^{(34)}) = +G_{6,0}^{(56)}$$
$$D(G_{7,7}^{(38)}) = +G_{6,0}^{(59)}$$
$$D(G_{7,7}^{(40)}) = +G_{6,0}^{(54)}$$
$$D(G_{7,7}^{(41)}) = +G_{6,0}^{(60)}$$
$$D(G_{7,7}^{(42)}) = +G_{6,1}^{(63)}$$
$$D(G_{7,7}^{(44)}) = +G_{6,0}^{(57)}$$
$$D(G_{7,7}^{(46)}) = +G_{6,0}^{(55)}$$
$$D(G_{7,7}^{(47)}) = +G_{6,1}^{(61)}$$

The Fatgraph $G_{7,8}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),       # a
  Vertex([5, 1, 2, 6, 6]),# b
  Vertex([5, 2, 3]),       # c
  Vertex([4, 4, 3]),       # d
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^1b^2 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^4b^0 \to {}^0c^1 \to {}^2b^3)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

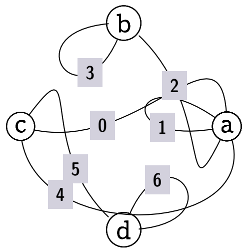
Fatgraph $G_{7,8}$ only has the identity automorphism, so the marked fatgraphs $G_{7,8}^{(0)}$ to $G_{7,8}^{(120)}$ are formed by decorating boundary cycles of $G_{7,8}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{7,8}^{(0)}) = +G_{6,0}^{(34)} + G_{6,0}^{(48)}$$
$$D(G_{7,8}^{(1)}) = +G_{6,0}^{(32)} + G_{6,0}^{(42)}$$
$$D(G_{7,8}^{(2)}) = +G_{6,0}^{(35)} + G_{6,0}^{(49)}$$
$$D(G_{7,8}^{(3)}) = +G_{6,0}^{(30)} + G_{6,0}^{(36)}$$
$$D(G_{7,8}^{(4)}) = +G_{6,0}^{(33)} + G_{6,0}^{(43)}$$
$$D(G_{7,8}^{(5)}) = +G_{6,0}^{(31)} + G_{6,0}^{(37)}$$
$$D(G_{7,8}^{(6)}) = +G_{6,0}^{(40)} + G_{6,0}^{(50)}$$
$$D(G_{7,8}^{(7)}) = +G_{6,0}^{(38)} + G_{6,0}^{(44)}$$
$$D(G_{7,8}^{(8)}) = +G_{6,0}^{(41)} + G_{6,0}^{(51)}$$
$$D(G_{7,8}^{(9)}) = +G_{6,0}^{(30)} + G_{6,0}^{(36)}$$
$$D(G_{7,8}^{(10)}) = +G_{6,0}^{(39)} + G_{6,0}^{(45)}$$
$$D(G_{7,8}^{(11)}) = +G_{6,0}^{(31)} + G_{6,0}^{(37)}$$
$$D(G_{7,8}^{(12)}) = +G_{6,0}^{(46)} + G_{6,0}^{(52)}$$
$$D(G_{7,8}^{(13)}) = +G_{6,0}^{(38)} + G_{6,0}^{(44)}$$
$$D(G_{7,8}^{(14)}) = +G_{6,0}^{(47)} + G_{6,0}^{(53)}$$
$$D(G_{7,8}^{(15)}) = +G_{6,0}^{(32)} + G_{6,0}^{(42)}$$
$$D(G_{7,8}^{(16)}) = +G_{6,0}^{(39)} + G_{6,0}^{(45)}$$
$$D(G_{7,8}^{(17)}) = +G_{6,0}^{(33)} + G_{6,0}^{(43)}$$
$$D(G_{7,8}^{(18)}) = +G_{6,0}^{(46)} + G_{6,0}^{(52)}$$
$$D(G_{7,8}^{(19)}) = +G_{6,0}^{(40)} + G_{6,0}^{(50)}$$
$$D(G_{7,8}^{(20)}) = +G_{6,0}^{(47)} + G_{6,0}^{(53)}$$
$$D(G_{7,8}^{(21)}) = +G_{6,0}^{(34)} + G_{6,0}^{(48)}$$

$D(G_{7,8}^{(22)}) = +G_{6,0}^{(41)} + G_{6,0}^{(51)}$
$D(G_{7,8}^{(23)}) = +G_{6,0}^{(35)} + G_{6,0}^{(49)}$
$D(G_{7,8}^{(24)}) = +G_{6,0}^{(58)}$
$D(G_{7,8}^{(25)}) = +G_{6,0}^{(56)}$
$D(G_{7,8}^{(26)}) = +G_{6,0}^{(59)}$
$D(G_{7,8}^{(27)}) = +G_{6,0}^{(54)} + G_{6,0}^{(60)}$
$D(G_{7,8}^{(28)}) = +G_{6,0}^{(57)}$
$D(G_{7,8}^{(29)}) = +G_{6,0}^{(55)} + G_{6,1}^{(61)}$
$D(G_{7,8}^{(30)}) = +G_{6,1}^{(64)}$
$D(G_{7,8}^{(31)}) = +G_{6,1}^{(62)}$
$D(G_{7,8}^{(33)}) = +G_{6,0}^{(54)} + G_{6,0}^{(60)}$
$D(G_{7,8}^{(34)}) = +G_{6,1}^{(63)}$
$D(G_{7,8}^{(35)}) = +G_{6,0}^{(55)} + G_{6,1}^{(61)}$
$D(G_{7,8}^{(37)}) = +G_{6,1}^{(62)}$
$D(G_{7,8}^{(39)}) = +G_{6,0}^{(56)}$
$D(G_{7,8}^{(40)}) = +G_{6,1}^{(63)}$
$D(G_{7,8}^{(41)}) = +G_{6,0}^{(57)}$
$D(G_{7,8}^{(43)}) = +G_{6,1}^{(64)}$
$D(G_{7,8}^{(45)}) = +G_{6,0}^{(58)}$
$D(G_{7,8}^{(47)}) = +G_{6,0}^{(59)}$

The Fatgraph $G_{7,9}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 1, 2, 4]),# a
  Vertex([3, 3, 2]),      # b
  Vertex([4, 0, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

$$\alpha = ({}^3a^4 \to {}^2a^3 \to {}^0a^1 \to {}^1b^2 \to {}^0c^1 \to {}^2b^0)$$
$$\beta = ({}^1a^2)$$
$$\gamma = ({}^2d^0 \to {}^2c^0 \to {}^1d^2 \to {}^1c^2 \to {}^4a^0)$$
$$\delta = ({}^0b^1)$$
$$\epsilon = ({}^0d^1)$$

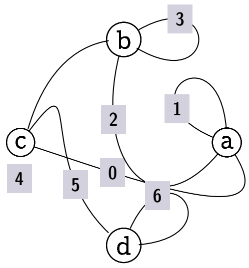
Markings

Fatgraph $G_{7,9}$ only has the identity automorphism, so the marked fatgraphs $G_{7,9}^{(0)}$ to $G_{7,9}^{(120)}$ are formed by decorating boundary cycles of $G_{7,9}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{7,9}^{(0)}) = +G_{6,0}^{(3)}$$
$$D(G_{7,9}^{(1)}) = +G_{6,0}^{(5)}$$
$$D(G_{7,9}^{(2)}) = +G_{6,0}^{(1)}$$
$$D(G_{7,9}^{(3)}) = +G_{6,0}^{(4)}$$
$$D(G_{7,9}^{(4)}) = +G_{6,0}^{(0)}$$
$$D(G_{7,9}^{(5)}) = +G_{6,0}^{(2)}$$
$$D(G_{7,9}^{(6)}) = +G_{6,0}^{(9)}$$
$$D(G_{7,9}^{(7)}) = +G_{6,0}^{(11)}$$
$$D(G_{7,9}^{(8)}) = +G_{6,0}^{(7)}$$
$$D(G_{7,9}^{(9)}) = +G_{6,0}^{(10)}$$
$$D(G_{7,9}^{(10)}) = +G_{6,0}^{(6)}$$
$$D(G_{7,9}^{(11)}) = +G_{6,0}^{(8)}$$
$$D(G_{7,9}^{(12)}) = +G_{6,0}^{(15)}$$
$$D(G_{7,9}^{(13)}) = +G_{6,0}^{(17)}$$
$$D(G_{7,9}^{(14)}) = +G_{6,0}^{(13)}$$
$$D(G_{7,9}^{(15)}) = +G_{6,0}^{(16)}$$
$$D(G_{7,9}^{(16)}) = +G_{6,0}^{(12)}$$
$$D(G_{7,9}^{(17)}) = +G_{6,0}^{(14)}$$
$$D(G_{7,9}^{(18)}) = +G_{6,0}^{(21)}$$
$$D(G_{7,9}^{(19)}) = +G_{6,0}^{(23)}$$
$$D(G_{7,9}^{(20)}) = +G_{6,0}^{(19)}$$
$$D(G_{7,9}^{(21)}) = +G_{6,0}^{(22)}$$
$$D(G_{7,9}^{(22)}) = +G_{6,0}^{(18)}$$
$$D(G_{7,9}^{(23)}) = +G_{6,0}^{(20)}$$
$$D(G_{7,9}^{(24)}) = +G_{6,0}^{(27)}$$
$$D(G_{7,9}^{(25)}) = +G_{6,0}^{(29)}$$
$$D(G_{7,9}^{(26)}) = +G_{6,0}^{(25)}$$
$$D(G_{7,9}^{(27)}) = +G_{6,0}^{(28)}$$
$$D(G_{7,9}^{(28)}) = +G_{6,0}^{(24)}$$
$$D(G_{7,9}^{(29)}) = +G_{6,0}^{(26)}$$
$$D(G_{7,9}^{(30)}) = -G_{6,0}^{(6)}$$
$$D(G_{7,9}^{(31)}) = -G_{6,0}^{(7)}$$
$$D(G_{7,9}^{(32)}) = -G_{6,0}^{(11)}$$
$$D(G_{7,9}^{(33)}) = -G_{6,0}^{(9)}$$
$$D(G_{7,9}^{(34)}) = -G_{6,0}^{(12)}$$
$$D(G_{7,9}^{(35)}) = -G_{6,0}^{(13)}$$
$$D(G_{7,9}^{(36)}) = -G_{6,0}^{(17)}$$
$$D(G_{7,9}^{(37)}) = -G_{6,0}^{(15)}$$
$$D(G_{7,9}^{(38)}) = -G_{6,0}^{(18)}$$
$$D(G_{7,9}^{(39)}) = -G_{6,0}^{(19)}$$
$$D(G_{7,9}^{(40)}) = -G_{6,0}^{(23)}$$
$$D(G_{7,9}^{(41)}) = -G_{6,0}^{(21)}$$
$$D(G_{7,9}^{(42)}) = -G_{6,0}^{(24)}$$
$$D(G_{7,9}^{(43)}) = -G_{6,0}^{(25)}$$
$$D(G_{7,9}^{(44)}) = -G_{6,0}^{(29)}$$
$$D(G_{7,9}^{(45)}) = -G_{6,0}^{(27)}$$
$$D(G_{7,9}^{(46)}) = -G_{6,0}^{(0)}$$
$$D(G_{7,9}^{(47)}) = -G_{6,0}^{(1)}$$
$$D(G_{7,9}^{(48)}) = -G_{6,0}^{(5)}$$
$$D(G_{7,9}^{(49)}) = -G_{6,0}^{(3)}$$
$$D(G_{7,9}^{(50)}) = -G_{6,0}^{(14)}$$
$$D(G_{7,9}^{(51)}) = -G_{6,0}^{(16)}$$
$$D(G_{7,9}^{(52)}) = -G_{6,0}^{(20)}$$
$$D(G_{7,9}^{(53)}) = -G_{6,0}^{(22)}$$
$$D(G_{7,9}^{(54)}) = -G_{6,0}^{(26)}$$
$$D(G_{7,9}^{(55)}) = -G_{6,0}^{(28)}$$
$$D(G_{7,9}^{(56)}) = -G_{6,0}^{(2)}$$
$$D(G_{7,9}^{(57)}) = -G_{6,0}^{(4)}$$
$$D(G_{7,9}^{(58)}) = -G_{6,0}^{(8)}$$
$$D(G_{7,9}^{(59)}) = -G_{6,0}^{(10)}$$

The Fatgraph $G_{7,10}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([4, 2, 3, 3]),# b
  Vertex([4, 0, 5]),   # c
  Vertex([6, 6, 5]),   # d
])
```

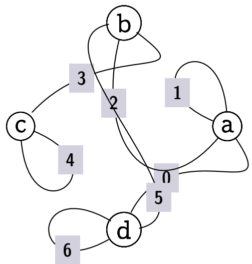
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^0a^1) \\
\beta &= ({}^1a^2 \to {}^3a^0 \to {}^3b^0 \to {}^0c^1 \to {}^1b^2) \\
\gamma &= ({}^2d^0 \to {}^2a^3 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^1d^2) \\
\delta &= ({}^2b^3) \\
\epsilon &= ({}^0d^1)
\end{aligned}$$

Markings

Fatgraph $G_{7,10}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,10}$ to $G^{(120)}_{7,10}$ are formed by decorating boundary cycles of $G_{7,10}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,11}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([5, 2, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 0, 6, 6]),# d
])
```

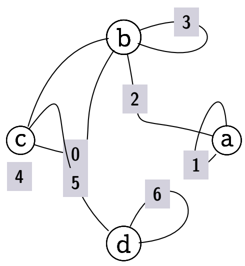
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{3}d^{0} \to {}^{1}d^{2} \to {}^{0}b^{1}) \\
\delta &= ({}^{0}c^{1}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

Fatgraph $G_{7,11}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,11}$ to $G^{(120)}_{7,11}$ are formed by decorating boundary cycles of $G_{7,11}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,12}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),      # a
  Vertex([4, 0, 2, 3, 3]),# b
  Vertex([4, 0, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{4}b^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{1}b^{2} \to {}^{0}c^{1} \to {}^{2}b^{3}) \\
\beta &= ({}^{2}a^{0}) \\
\gamma &= ({}^{2}d^{0} \to {}^{2}c^{0} \to {}^{1}d^{2} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,12}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,12}$ to $G^{(120)}_{7,12}$ are formed by decorating boundary cycles of $G_{7,12}$ with all

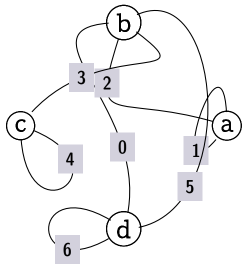
permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$D(G^{(0)}_{7,12}) = +G^{(10)}_{6,0}$
$D(G^{(1)}_{7,12}) = +G^{(8)}_{6,0}$
$D(G^{(2)}_{7,12}) = +G^{(16)}_{6,0}$
$D(G^{(3)}_{7,12}) = +G^{(14)}_{6,0}$
$D(G^{(4)}_{7,12}) = +G^{(22)}_{6,0}$
$D(G^{(5)}_{7,12}) = +G^{(20)}_{6,0}$
$D(G^{(6)}_{7,12}) = +G^{(4)}_{6,0}$
$D(G^{(7)}_{7,12}) = +G^{(2)}_{6,0}$
$D(G^{(8)}_{7,12}) = +G^{(17)}_{6,0}$
$D(G^{(9)}_{7,12}) = +G^{(12)}_{6,0}$
$D(G^{(10)}_{7,12}) = +G^{(23)}_{6,0}$
$D(G^{(11)}_{7,12}) = +G^{(18)}_{6,0}$
$D(G^{(12)}_{7,12}) = +G^{(5)}_{6,0}$
$D(G^{(13)}_{7,12}) = +G^{(0)}_{6,0} + G^{(64)}_{6,1}$
$D(G^{(14)}_{7,12}) = +G^{(11)}_{6,0}$
$D(G^{(15)}_{7,12}) = +G^{(6)}_{6,0}$
$D(G^{(16)}_{7,12}) = +G^{(21)}_{6,0}$
$D(G^{(17)}_{7,12}) = +G^{(19)}_{6,0}$
$D(G^{(18)}_{7,12}) = +G^{(3)}_{6,0} + G^{(63)}_{6,1}$
$D(G^{(19)}_{7,12}) = +G^{(1)}_{6,0} + G^{(62)}_{6,1}$
$D(G^{(20)}_{7,12}) = +G^{(9)}_{6,0}$
$D(G^{(21)}_{7,12}) = +G^{(7)}_{6,0}$
$D(G^{(22)}_{7,12}) = +G^{(15)}_{6,0}$
$D(G^{(23)}_{7,12}) = +G^{(13)}_{6,0}$
$D(G^{(24)}_{7,12}) = +G^{(28)}_{6,0} + G^{(47)}_{6,0} + G^{(52)}_{6,0}$
$D(G^{(25)}_{7,12}) = +G^{(26)}_{6,0} + G^{(46)}_{6,0} + G^{(53)}_{6,0}$
$D(G^{(26)}_{7,12}) = -G^{(13)}_{6,0}$
$D(G^{(27)}_{7,12}) = -G^{(15)}_{6,0}$
$D(G^{(28)}_{7,12}) = -G^{(19)}_{6,0}$
$D(G^{(29)}_{7,12}) = -G^{(21)}_{6,0}$
$D(G^{(30)}_{7,12}) = +G^{(29)}_{6,0} + G^{(41)}_{6,0} + G^{(50)}_{6,0}$
$D(G^{(31)}_{7,12}) = +G^{(24)}_{6,0} + G^{(40)}_{6,0} + G^{(51)}_{6,0}$
$D(G^{(32)}_{7,12}) = -G^{(7)}_{6,0}$
$D(G^{(33)}_{7,12}) = -G^{(9)}_{6,0}$
$D(G^{(34)}_{7,12}) = -G^{(18)}_{6,0}$
$D(G^{(35)}_{7,12}) = -G^{(23)}_{6,0}$
$D(G^{(36)}_{7,12}) = +G^{(27)}_{6,0} + G^{(39)}_{6,0} + G^{(44)}_{6,0}$
$D(G^{(37)}_{7,12}) = +G^{(25)}_{6,0} + G^{(38)}_{6,0} + G^{(45)}_{6,0}$
$D(G^{(38)}_{7,12}) = -G^{(6)}_{6,0}$
$D(G^{(39)}_{7,12}) = -G^{(11)}_{6,0}$
$D(G^{(40)}_{7,12}) = -G^{(12)}_{6,0}$
$D(G^{(41)}_{7,12}) = -G^{(17)}_{6,0}$
$D(G^{(42)}_{7,12}) = -G^{(25)}_{6,0} + G^{(35)}_{6,0} + G^{(48)}_{6,0}$
$D(G^{(43)}_{7,12}) = -G^{(27)}_{6,0} + G^{(34)}_{6,0} + G^{(49)}_{6,0}$
$D(G^{(44)}_{7,12}) = -G^{(1)}_{6,0} + G^{(59)}_{6,0}$
$D(G^{(45)}_{7,12}) = -G^{(3)}_{6,0} + G^{(58)}_{6,0}$
$D(G^{(46)}_{7,12}) = -G^{(20)}_{6,0}$
$D(G^{(47)}_{7,12}) = -G^{(22)}_{6,0}$
$D(G^{(48)}_{7,12}) = -G^{(24)}_{6,0} + G^{(33)}_{6,0} + G^{(42)}_{6,0}$
$D(G^{(49)}_{7,12}) = -G^{(29)}_{6,0} + G^{(32)}_{6,0} + G^{(43)}_{6,0}$
$D(G^{(50)}_{7,12}) = -G^{(0)}_{6,0} + G^{(57)}_{6,0}$
$D(G^{(51)}_{7,12}) = -G^{(5)}_{6,0} + G^{(56)}_{6,0}$
$D(G^{(52)}_{7,12}) = -G^{(14)}_{6,0}$
$D(G^{(53)}_{7,12}) = -G^{(16)}_{6,0}$
$D(G^{(54)}_{7,12}) = -G^{(26)}_{6,0} + G^{(31)}_{6,0} + G^{(36)}_{6,0}$
$D(G^{(55)}_{7,12}) = -G^{(28)}_{6,0} + G^{(30)}_{6,0} + G^{(37)}_{6,0}$
$D(G^{(56)}_{7,12}) = -G^{(2)}_{6,0} + G^{(55)}_{6,0} + G^{(60)}_{6,0}$
$D(G^{(57)}_{7,12}) = -G^{(4)}_{6,0} + G^{(54)}_{6,0} + G^{(61)}_{6,1}$
$D(G^{(58)}_{7,12}) = -G^{(8)}_{6,0}$
$D(G^{(59)}_{7,12}) = -G^{(10)}_{6,0}$
$D(G^{(60)}_{7,12}) = +G^{(6)}_{6,0}$
$D(G^{(61)}_{7,12}) = +G^{(7)}_{6,0}$
$D(G^{(62)}_{7,12}) = +G^{(12)}_{6,0}$
$D(G^{(63)}_{7,12}) = +G^{(13)}_{6,0}$
$D(G^{(64)}_{7,12}) = +G^{(18)}_{6,0}$
$D(G^{(65)}_{7,12}) = +G^{(19)}_{6,0}$
$D(G^{(66)}_{7,12}) = +G^{(0)}_{6,0}$
$D(G^{(67)}_{7,12}) = +G^{(1)}_{6,0}$

$D(G^{(68)}_{7,12}) = +G^{(14)}_{6,0}$
$D(G^{(69)}_{7,12}) = +G^{(15)}_{6,0}$
$D(G^{(70)}_{7,12}) = +G^{(20)}_{6,0}$
$D(G^{(71)}_{7,12}) = +G^{(21)}_{6,0}$
$D(G^{(72)}_{7,12}) = +G^{(2)}_{6,0} - G^{(64)}_{6,1}$
$D(G^{(73)}_{7,12}) = +G^{(3)}_{6,0}$
$D(G^{(74)}_{7,12}) = +G^{(8)}_{6,0}$
$D(G^{(75)}_{7,12}) = +G^{(9)}_{6,0}$
$D(G^{(76)}_{7,12}) = +G^{(22)}_{6,0}$
$D(G^{(77)}_{7,12}) = +G^{(23)}_{6,0}$
$D(G^{(78)}_{7,12}) = +G^{(4)}_{6,0} - G^{(62)}_{6,1} + G^{(63)}_{6,1}$
$D(G^{(79)}_{7,12}) = +G^{(5)}_{6,0}$
$D(G^{(80)}_{7,12}) = +G^{(10)}_{6,0}$
$D(G^{(81)}_{7,12}) = +G^{(11)}_{6,0}$
$D(G^{(82)}_{7,12}) = +G^{(16)}_{6,0}$
$D(G^{(83)}_{7,12}) = +G^{(17)}_{6,0}$
$D(G^{(84)}_{7,12}) = -G^{(9)}_{6,0}$
$D(G^{(85)}_{7,12}) = -G^{(11)}_{6,0}$
$D(G^{(86)}_{7,12}) = -G^{(15)}_{6,0}$
$D(G^{(87)}_{7,12}) = -G^{(17)}_{6,0}$
$D(G^{(88)}_{7,12}) = -G^{(21)}_{6,0}$
$D(G^{(89)}_{7,12}) = -G^{(23)}_{6,0}$
$D(G^{(90)}_{7,12}) = +G^{(24)}_{6,0} - G^{(46)}_{6,0} + G^{(47)}_{6,0}$
$D(G^{(91)}_{7,12}) = +G^{(25)}_{6,0} - G^{(52)}_{6,0} + G^{(53)}_{6,0}$
$D(G^{(92)}_{7,12}) = +G^{(16)}_{6,0}$
$D(G^{(93)}_{7,12}) = -G^{(12)}_{6,0}$
$D(G^{(94)}_{7,12}) = +G^{(22)}_{6,0}$
$D(G^{(95)}_{7,12}) = -G^{(18)}_{6,0}$
$D(G^{(96)}_{7,12}) = +G^{(26)}_{6,0} - G^{(40)}_{6,0} + G^{(41)}_{6,0}$
$D(G^{(97)}_{7,12}) = +G^{(27)}_{6,0} - G^{(50)}_{6,0} + G^{(51)}_{6,0}$
$D(G^{(98)}_{7,12}) = +G^{(10)}_{6,0}$
$D(G^{(99)}_{7,12}) = -G^{(6)}_{6,0}$
$D(G^{(100)}_{7,12}) = +G^{(20)}_{6,0}$
$D(G^{(101)}_{7,12}) = -G^{(19)}_{6,0}$
$D(G^{(102)}_{7,12}) = +G^{(28)}_{6,0} - G^{(38)}_{6,0} + G^{(39)}_{6,0}$
$D(G^{(103)}_{7,12}) = +G^{(29)}_{6,0} - G^{(44)}_{6,0} + G^{(45)}_{6,0}$
$D(G^{(104)}_{7,12}) = +G^{(8)}_{6,0}$
$D(G^{(105)}_{7,12}) = -G^{(7)}_{6,0}$
$D(G^{(106)}_{7,12}) = +G^{(14)}_{6,0}$
$D(G^{(107)}_{7,12}) = -G^{(13)}_{6,0}$
$D(G^{(108)}_{7,12}) = -G^{(3)}_{6,0}$
$D(G^{(109)}_{7,12}) = -G^{(5)}_{6,0}$
$D(G^{(110)}_{7,12}) = -G^{(13)}_{6,0}$
$D(G^{(111)}_{7,12}) = -G^{(16)}_{6,0}$
$D(G^{(112)}_{7,12}) = -G^{(19)}_{6,0}$
$D(G^{(113)}_{7,12}) = -G^{(22)}_{6,0}$
$D(G^{(114)}_{7,12}) = -G^{(27)}_{6,0} + G^{(46)}_{6,0} - G^{(47)}_{6,0}$
$D(G^{(115)}_{7,12}) = -G^{(29)}_{6,0} + G^{(52)}_{6,0} - G^{(53)}_{6,0}$
$D(G^{(116)}_{7,12}) = +G^{(17)}_{6,0}$
$D(G^{(117)}_{7,12}) = -G^{(14)}_{6,0}$
$D(G^{(118)}_{7,12}) = +G^{(23)}_{6,0}$
$D(G^{(119)}_{7,12}) = -G^{(20)}_{6,0}$

The Fatgraph $G_{7,13}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([0, 2, 3, 5]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 0, 6, 6]),# d
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{2}c^{0} \to {}^{0}b^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{2}a^{0}) \\
\gamma &= ({}^{3}d^{0} \to {}^{3}b^{0} \to {}^{1}d^{2}) \\
\delta &= ({}^{0}c^{1}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

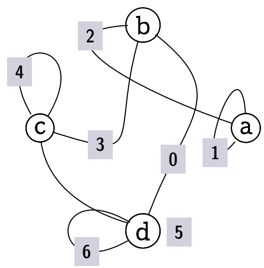
Fatgraph $G_{7,13}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,13}$ to $G^{(120)}_{7,13}$ are formed by decorating boundary cycles of $G_{7,13}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$\begin{aligned}
D(G^{(0)}_{7,13}) &= +G^{(28)}_{6,0} - G^{(34)}_{6,0} + G^{(35)}_{6,0} \\
D(G^{(1)}_{7,13}) &= -G^{(24)}_{6,0} - G^{(48)}_{6,0} + G^{(49)}_{6,0} \\
D(G^{(2)}_{7,13}) &= +G^{(4)}_{6,0} - G^{(58)}_{6,0} + G^{(59)}_{6,0} \\
D(G^{(3)}_{7,13}) &= -G^{(0)}_{6,0} \\
D(G^{(4)}_{7,13}) &= +G^{(18)}_{6,0} \\
D(G^{(5)}_{7,13}) &= -G^{(21)}_{6,0} \\
D(G^{(6)}_{7,13}) &= +G^{(26)}_{6,0} - G^{(32)}_{6,0} + G^{(33)}_{6,0} \\
D(G^{(7)}_{7,13}) &= -G^{(25)}_{6,0} - G^{(42)}_{6,0} + G^{(43)}_{6,0} \\
D(G^{(8)}_{7,13}) &= +G^{(2)}_{6,0} - G^{(56)}_{6,0} + G^{(57)}_{6,0} \\
D(G^{(9)}_{7,13}) &= -G^{(1)}_{6,0} \\
D(G^{(10)}_{7,13}) &= +G^{(12)}_{6,0} \\
D(G^{(11)}_{7,13}) &= -G^{(15)}_{6,0} \\
D(G^{(12)}_{7,13}) &= -G^{(1)}_{6,0} + G^{(64)}_{6,1} \\
D(G^{(13)}_{7,13}) &= -G^{(4)}_{6,0} \\
D(G^{(14)}_{7,13}) &= -G^{(7)}_{6,0} \\
D(G^{(15)}_{7,13}) &= -G^{(10)}_{6,0} \\
D(G^{(16)}_{7,13}) &= -G^{(18)}_{6,0} \\
D(G^{(17)}_{7,13}) &= -G^{(20)}_{6,0} \\
D(G^{(18)}_{7,13}) &= -G^{(25)}_{6,0} + G^{(40)}_{6,0} - G^{(41)}_{6,0} \\
D(G^{(19)}_{7,13}) &= -G^{(28)}_{6,0} + G^{(50)}_{6,0} - G^{(51)}_{6,0} \\
D(G^{(20)}_{7,13}) &= +G^{(11)}_{6,0} \\
D(G^{(21)}_{7,13}) &= -G^{(8)}_{6,0}
\end{aligned}$$

$$D(G^{(22)}_{7,13}) = +G^{(21)}_{6,0}$$
$$D(G^{(23)}_{7,13}) = -G^{(22)}_{6,0}$$
$$D(G^{(24)}_{7,13}) = +G^{(29)}_{6,0} + G^{(34)}_{6,0} - G^{(35)}_{6,0}$$
$$D(G^{(25)}_{7,13}) = -G^{(26)}_{6,0} + G^{(48)}_{6,0} - G^{(49)}_{6,0}$$
$$D(G^{(26)}_{7,13}) = +G^{(5)}_{6,0} + G^{(58)}_{6,0} - G^{(59)}_{6,0}$$
$$D(G^{(27)}_{7,13}) = -G^{(2)}_{6,0}$$
$$D(G^{(28)}_{7,13}) = +G^{(19)}_{6,0}$$
$$D(G^{(29)}_{7,13}) = -G^{(23)}_{6,0}$$
$$D(G^{(30)}_{7,13}) = +G^{(24)}_{6,0} - G^{(30)}_{6,0} + G^{(31)}_{6,0}$$
$$D(G^{(31)}_{7,13}) = -G^{(27)}_{6,0} - G^{(36)}_{6,0} + G^{(37)}_{6,0}$$
$$D(G^{(32)}_{7,13}) = +G^{(0)}_{6,0} - G^{(54)}_{6,0} + G^{(55)}_{6,0}$$
$$D(G^{(33)}_{7,13}) = -G^{(3)}_{6,0} - G^{(60)}_{6,0} + G^{(61)}_{6,1}$$
$$D(G^{(34)}_{7,13}) = +G^{(6)}_{6,0}$$
$$D(G^{(35)}_{7,13}) = -G^{(9)}_{6,0}$$
$$D(G^{(36)}_{7,13}) = -G^{(0)}_{6,0} + G^{(62)}_{6,1} - G^{(63)}_{6,1}$$
$$D(G^{(37)}_{7,13}) = -G^{(2)}_{6,0}$$
$$D(G^{(38)}_{7,13}) = -G^{(6)}_{6,0}$$
$$D(G^{(39)}_{7,13}) = -G^{(8)}_{6,0}$$
$$D(G^{(40)}_{7,13}) = -G^{(12)}_{6,0}$$
$$D(G^{(41)}_{7,13}) = -G^{(14)}_{6,0}$$
$$D(G^{(42)}_{7,13}) = -G^{(24)}_{6,0} + G^{(38)}_{6,0} - G^{(39)}_{6,0}$$
$$D(G^{(43)}_{7,13}) = -G^{(26)}_{6,0} + G^{(44)}_{6,0} - G^{(45)}_{6,0}$$
$$D(G^{(44)}_{7,13}) = +G^{(9)}_{6,0}$$
$$D(G^{(45)}_{7,13}) = -G^{(10)}_{6,0}$$
$$D(G^{(46)}_{7,13}) = +G^{(15)}_{6,0}$$
$$D(G^{(47)}_{7,13}) = -G^{(16)}_{6,0}$$
$$D(G^{(48)}_{7,13}) = +G^{(27)}_{6,0} + G^{(32)}_{6,0} - G^{(33)}_{6,0}$$
$$D(G^{(49)}_{7,13}) = -G^{(28)}_{6,0} + G^{(42)}_{6,0} - G^{(43)}_{6,0}$$
$$D(G^{(50)}_{7,13}) = +G^{(3)}_{6,0} + G^{(56)}_{6,0} - G^{(57)}_{6,0}$$
$$D(G^{(51)}_{7,13}) = -G^{(4)}_{6,0}$$
$$D(G^{(52)}_{7,13}) = +G^{(13)}_{6,0}$$
$$D(G^{(53)}_{7,13}) = -G^{(17)}_{6,0}$$
$$D(G^{(54)}_{7,13}) = +G^{(25)}_{6,0} + G^{(30)}_{6,0} - G^{(31)}_{6,0}$$
$$D(G^{(55)}_{7,13}) = -G^{(29)}_{6,0} + G^{(36)}_{6,0} - G^{(37)}_{6,0}$$
$$D(G^{(56)}_{7,13}) = +G^{(1)}_{6,0} + G^{(54)}_{6,0} - G^{(55)}_{6,0}$$
$$D(G^{(57)}_{7,13}) = -G^{(5)}_{6,0} + G^{(60)}_{6,0} - G^{(61)}_{6,1}$$
$$D(G^{(58)}_{7,13}) = +G^{(7)}_{6,0}$$
$$D(G^{(59)}_{7,13}) = -G^{(11)}_{6,0}$$
$$D(G^{(60)}_{7,13}) = +G^{(34)}_{6,0}$$
$$D(G^{(61)}_{7,13}) = +G^{(32)}_{6,0}$$
$$D(G^{(62)}_{7,13}) = +G^{(35)}_{6,0}$$
$$D(G^{(63)}_{7,13}) = +G^{(30)}_{6,0}$$
$$D(G^{(64)}_{7,13}) = +G^{(33)}_{6,0}$$
$$D(G^{(65)}_{7,13}) = +G^{(31)}_{6,0}$$
$$D(G^{(66)}_{7,13}) = +G^{(40)}_{6,0} + G^{(62)}_{6,1}$$
$$D(G^{(67)}_{7,13}) = +G^{(38)}_{6,0} + G^{(64)}_{6,1}$$
$$D(G^{(68)}_{7,13}) = +G^{(41)}_{6,0}$$
$$D(G^{(69)}_{7,13}) = +G^{(36)}_{6,0}$$
$$D(G^{(70)}_{7,13}) = +G^{(39)}_{6,0}$$
$$D(G^{(71)}_{7,13}) = +G^{(37)}_{6,0}$$
$$D(G^{(72)}_{7,13}) = +G^{(46)}_{6,0}$$
$$D(G^{(73)}_{7,13}) = +G^{(44)}_{6,0}$$
$$D(G^{(74)}_{7,13}) = +G^{(47)}_{6,0}$$
$$D(G^{(75)}_{7,13}) = +G^{(42)}_{6,0}$$
$$D(G^{(76)}_{7,13}) = +G^{(45)}_{6,0}$$
$$D(G^{(77)}_{7,13}) = +G^{(43)}_{6,0}$$
$$D(G^{(78)}_{7,13}) = +G^{(52)}_{6,0}$$
$$D(G^{(79)}_{7,13}) = +G^{(50)}_{6,0}$$
$$D(G^{(80)}_{7,13}) = +G^{(53)}_{6,0}$$
$$D(G^{(81)}_{7,13}) = +G^{(48)}_{6,0}$$
$$D(G^{(82)}_{7,13}) = +G^{(51)}_{6,0}$$
$$D(G^{(83)}_{7,13}) = +G^{(49)}_{6,0}$$
$$D(G^{(84)}_{7,13}) = +G^{(58)}_{6,0}$$
$$D(G^{(85)}_{7,13}) = +G^{(56)}_{6,0}$$
$$D(G^{(86)}_{7,13}) = +G^{(59)}_{6,0}$$
$$D(G^{(87)}_{7,13}) = +G^{(54)}_{6,0}$$
$$D(G^{(88)}_{7,13}) = +G^{(57)}_{6,0}$$
$$D(G^{(89)}_{7,13}) = +G^{(55)}_{6,0}$$
$$D(G^{(91)}_{7,13}) = +G^{(60)}_{6,0}$$
$$D(G^{(92)}_{7,13}) = +G^{(63)}_{6,1}$$
$$D(G^{(93)}_{7,13}) = +G^{(61)}_{6,1}$$

The Fatgraph $G_{7,14}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([5, 3, 4, 4]),# c
  Vertex([5, 0, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{0}d^{1} \to {}^{2}b^{0})$$
$$\beta = ({}^{2}a^{0})$$
$$\gamma = ({}^{3}d^{0} \to {}^{1}d^{2} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

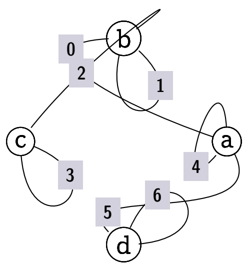
Fatgraph $G_{7,14}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,14}$ to $G^{(120)}_{7,14}$ are formed by decorating boundary cycles of $G_{7,14}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G^{(0)}_{7,14}) = +G^{(30)}_{6,0}$$
$$D(G^{(1)}_{7,14}) = +G^{(31)}_{6,0}$$
$$D(G^{(2)}_{7,14}) = +G^{(32)}_{6,0}$$
$$D(G^{(3)}_{7,14}) = +G^{(33)}_{6,0}$$
$$D(G^{(4)}_{7,14}) = +G^{(34)}_{6,0}$$
$$D(G^{(5)}_{7,14}) = +G^{(35)}_{6,0}$$
$$D(G^{(6)}_{7,14}) = +G^{(36)}_{6,0}$$
$$D(G^{(7)}_{7,14}) = +G^{(37)}_{6,0}$$
$$D(G^{(8)}_{7,14}) = +G^{(38)}_{6,0}$$
$$D(G^{(9)}_{7,14}) = +G^{(39)}_{6,0}$$
$$D(G^{(10)}_{7,14}) = +G^{(40)}_{6,0}$$
$$D(G^{(11)}_{7,14}) = +G^{(41)}_{6,0}$$
$$D(G^{(12)}_{7,14}) = +G^{(42)}_{6,0}$$
$$D(G^{(13)}_{7,14}) = +G^{(43)}_{6,0}$$
$$D(G^{(14)}_{7,14}) = +G^{(44)}_{6,0} - G^{(64)}_{6,1}$$
$$D(G^{(15)}_{7,14}) = +G^{(45)}_{6,0}$$
$$D(G^{(16)}_{7,14}) = +G^{(46)}_{6,0}$$
$$D(G^{(17)}_{7,14}) = +G^{(47)}_{6,0}$$
$$D(G^{(18)}_{7,14}) = +G^{(48)}_{6,0}$$
$$D(G^{(19)}_{7,14}) = +G^{(49)}_{6,0}$$
$$D(G^{(20)}_{7,14}) = +G^{(50)}_{6,0} - G^{(62)}_{6,1}$$
$$D(G^{(21)}_{7,14}) = +G^{(51)}_{6,0}$$

$D(G_{7,14}^{(22)}) = +G_{6,0}^{(52)}$
$D(G_{7,14}^{(23)}) = +G_{6,0}^{(53)}$
$D(G_{7,14}^{(24)}) = +G_{6,0}^{(54)}$
$D(G_{7,14}^{(25)}) = +G_{6,0}^{(55)}$
$D(G_{7,14}^{(26)}) = +G_{6,0}^{(56)}$
$D(G_{7,14}^{(27)}) = +G_{6,0}^{(57)}$
$D(G_{7,14}^{(28)}) = +G_{6,0}^{(58)}$
$D(G_{7,14}^{(29)}) = +G_{6,0}^{(59)}$
$D(G_{7,14}^{(30)}) = +G_{6,0}^{(60)}$
$D(G_{7,14}^{(31)}) = +G_{6,1}^{(61)}$
$D(G_{7,14}^{(32)}) = -G_{6,0}^{(46)} + G_{6,1}^{(62)}$
$D(G_{7,14}^{(33)}) = +G_{6,1}^{(63)}$
$D(G_{7,14}^{(34)}) = -G_{6,0}^{(52)} + G_{6,1}^{(64)}$
$D(G_{7,14}^{(38)}) = -G_{6,0}^{(40)}$
$D(G_{7,14}^{(40)}) = -G_{6,0}^{(50)}$
$D(G_{7,14}^{(44)}) = -G_{6,0}^{(38)}$
$D(G_{7,14}^{(46)}) = -G_{6,0}^{(44)}$
$D(G_{7,14}^{(56)}) = -G_{6,0}^{(47)}$
$D(G_{7,14}^{(58)}) = -G_{6,0}^{(53)}$
$D(G_{7,14}^{(60)}) = -G_{6,0}^{(58)}$
$D(G_{7,14}^{(62)}) = -G_{6,0}^{(34)}$
$D(G_{7,14}^{(64)}) = -G_{6,0}^{(48)}$
$D(G_{7,14}^{(66)}) = -G_{6,0}^{(56)}$
$D(G_{7,14}^{(68)}) = -G_{6,0}^{(32)}$
$D(G_{7,14}^{(70)}) = -G_{6,0}^{(42)}$
$D(G_{7,14}^{(80)}) = -G_{6,0}^{(41)}$
$D(G_{7,14}^{(82)}) = -G_{6,0}^{(51)}$
$D(G_{7,14}^{(84)}) = -G_{6,0}^{(59)}$
$D(G_{7,14}^{(86)}) = -G_{6,0}^{(35)}$
$D(G_{7,14}^{(88)}) = -G_{6,0}^{(49)}$
$D(G_{7,14}^{(90)}) = -G_{6,0}^{(54)}$
$D(G_{7,14}^{(92)}) = -G_{6,0}^{(30)}$
$D(G_{7,14}^{(94)}) = -G_{6,0}^{(36)}$
$D(G_{7,14}^{(95)}) = -G_{6,0}^{(60)}$
$D(G_{7,14}^{(98)}) = -G_{6,1}^{(63)}$
$D(G_{7,14}^{(104)}) = -G_{6,0}^{(39)}$
$D(G_{7,14}^{(106)}) = -G_{6,0}^{(45)}$
$D(G_{7,14}^{(108)}) = -G_{6,0}^{(57)}$
$D(G_{7,14}^{(110)}) = -G_{6,0}^{(33)}$
$D(G_{7,14}^{(112)}) = -G_{6,0}^{(43)}$
$D(G_{7,14}^{(114)}) = -G_{6,0}^{(55)}$
$D(G_{7,14}^{(116)}) = -G_{6,0}^{(31)}$
$D(G_{7,14}^{(118)}) = -G_{6,0}^{(37)}$
$D(G_{7,14}^{(119)}) = -G_{6,1}^{(61)}$

The Fatgraph $G_{7,15}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 4, 5]),# a
  Vertex([0, 1, 1, 2]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}b^{3} \to {}^{3}b^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}b^{1})$$
$$\beta = ({}^{2}a^{3} \to {}^{2}d^{0} \to {}^{3}a^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

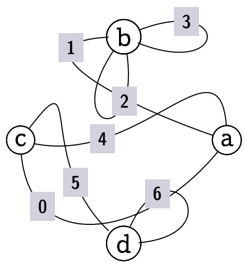
Fatgraph $G_{7,15}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,15}$ to $G^{(120)}_{7,15}$ are formed by decorating boundary cycles of $G_{7,15}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G^{(3)}_{7,15}) = +G^{(60)}_{6,0}$$
$$D(G^{(5)}_{7,15}) = +G^{(61)}_{6,1}$$
$$D(G^{(12)}_{7,15}) = +G^{(48)}_{6,0}$$
$$D(G^{(13)}_{7,15}) = +G^{(42)}_{6,0}$$
$$D(G^{(14)}_{7,15}) = +G^{(49)}_{6,0}$$
$$D(G^{(15)}_{7,15}) = +G^{(36)}_{6,0}$$
$$D(G^{(16)}_{7,15}) = +G^{(43)}_{6,0}$$
$$D(G^{(17)}_{7,15}) = +G^{(37)}_{6,0}$$
$$D(G^{(24)}_{7,15}) = +G^{(50)}_{6,0}$$
$$D(G^{(25)}_{7,15}) = +G^{(44)}_{6,0}$$
$$D(G^{(26)}_{7,15}) = +G^{(51)}_{6,0}$$
$$D(G^{(27)}_{7,15}) = +G^{(30)}_{6,0}$$
$$D(G^{(28)}_{7,15}) = +G^{(45)}_{6,0}$$
$$D(G^{(29)}_{7,15}) = +G^{(31)}_{6,0}$$
$$D(G^{(31)}_{7,15}) = +G^{(54)}_{6,0}$$
$$D(G^{(33)}_{7,15}) = +G^{(55)}_{6,0}$$
$$D(G^{(36)}_{7,15}) = +G^{(52)}_{6,0} + G^{(62)}_{6,1}$$
$$D(G^{(37)}_{7,15}) = +G^{(38)}_{6,0}$$
$$D(G^{(38)}_{7,15}) = +G^{(53)}_{6,0}$$
$$D(G^{(39)}_{7,15}) = +G^{(32)}_{6,0}$$
$$D(G^{(40)}_{7,15}) = +G^{(39)}_{6,0}$$
$$D(G^{(41)}_{7,15}) = +G^{(33)}_{6,0}$$
$$D(G^{(43)}_{7,15}) = +G^{(56)}_{6,0}$$
$$D(G^{(44)}_{7,15}) = +G^{(63)}_{6,1}$$
$$D(G^{(45)}_{7,15}) = +G^{(57)}_{6,0}$$
$$D(G^{(48)}_{7,15}) = +G^{(46)}_{6,0} + G^{(64)}_{6,1}$$
$$D(G^{(49)}_{7,15}) = +G^{(40)}_{6,0}$$
$$D(G^{(50)}_{7,15}) = +G^{(47)}_{6,0}$$
$$D(G^{(51)}_{7,15}) = +G^{(34)}_{6,0}$$
$$D(G^{(52)}_{7,15}) = +G^{(41)}_{6,0}$$
$$D(G^{(53)}_{7,15}) = +G^{(35)}_{6,0}$$
$$D(G^{(55)}_{7,15}) = +G^{(58)}_{6,0}$$
$$D(G^{(57)}_{7,15}) = +G^{(59)}_{6,0}$$
$$D(G^{(60)}_{7,15}) = +G^{(30)}_{6,0}$$
$$D(G^{(61)}_{7,15}) = +G^{(31)}_{6,0}$$
$$D(G^{(62)}_{7,15}) = +G^{(32)}_{6,0}$$
$$D(G^{(63)}_{7,15}) = +G^{(33)}_{6,0}$$
$$D(G^{(64)}_{7,15}) = +G^{(34)}_{6,0}$$
$$D(G^{(65)}_{7,15}) = +G^{(35)}_{6,0}$$
$$D(G^{(66)}_{7,15}) = +G^{(36)}_{6,0}$$
$$D(G^{(67)}_{7,15}) = +G^{(37)}_{6,0}$$
$$D(G^{(68)}_{7,15}) = +G^{(38)}_{6,0}$$
$$D(G^{(69)}_{7,15}) = +G^{(39)}_{6,0}$$
$$D(G^{(70)}_{7,15}) = +G^{(40)}_{6,0}$$

$$
\begin{aligned}
D(G_{7,15}^{(71)}) &= +G_{6,0}^{(41)} & D(G_{7,15}^{(83)}) &= +G_{6,0}^{(53)} \\
D(G_{7,15}^{(72)}) &= +G_{6,0}^{(42)} & D(G_{7,15}^{(84)}) &= +G_{6,0}^{(54)} \\
D(G_{7,15}^{(73)}) &= +G_{6,0}^{(43)} & D(G_{7,15}^{(85)}) &= +G_{6,0}^{(55)} \\
D(G_{7,15}^{(74)}) &= +G_{6,0}^{(44)} & D(G_{7,15}^{(86)}) &= +G_{6,0}^{(56)} \\
D(G_{7,15}^{(75)}) &= +G_{6,0}^{(45)} & D(G_{7,15}^{(87)}) &= +G_{6,0}^{(57)} \\
D(G_{7,15}^{(76)}) &= +G_{6,0}^{(46)} & D(G_{7,15}^{(88)}) &= +G_{6,0}^{(58)} \\
D(G_{7,15}^{(77)}) &= +G_{6,0}^{(47)} & D(G_{7,15}^{(89)}) &= +G_{6,0}^{(59)} \\
D(G_{7,15}^{(78)}) &= +G_{6,0}^{(48)} & D(G_{7,15}^{(90)}) &= +G_{6,0}^{(60)} \\
D(G_{7,15}^{(79)}) &= +G_{6,0}^{(49)} & D(G_{7,15}^{(91)}) &= +G_{6,1}^{(61)} \\
D(G_{7,15}^{(80)}) &= +G_{6,0}^{(50)} & D(G_{7,15}^{(92)}) &= +G_{6,1}^{(62)} \\
D(G_{7,15}^{(81)}) &= +G_{6,0}^{(51)} & D(G_{7,15}^{(93)}) &= +G_{6,1}^{(63)} \\
D(G_{7,15}^{(82)}) &= +G_{6,0}^{(52)} & D(G_{7,15}^{(94)}) &= +G_{6,1}^{(64)}
\end{aligned}
$$

The Fatgraph $G_{7,16}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),       # a
  Vertex([1, 2, 2, 3, 3]),# b
  Vertex([0, 4, 5]),       # c
  Vertex([6, 6, 5]),       # d
])
```

Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^4b^0 \to {}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^0c^1 \to {}^0b^1) \\
\beta &= ({}^2d^0 \to {}^2a^0 \to {}^1d^2 \to {}^1c^2 \to {}^2c^0) \\
\gamma &= ({}^1b^2) \\
\delta &= ({}^3b^4) \\
\epsilon &= ({}^0d^1)
\end{aligned}
$$

Markings

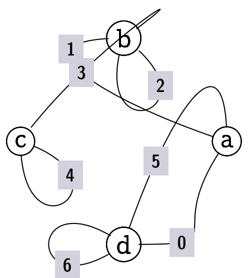
Fatgraph $G_{7,16}$ only has the identity automorphism, so the marked fatgraphs $G_{7,16}^{(0)}$ to $G_{7,16}^{(120)}$ are formed by decorating boundary cycles of $G_{7,16}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G^{(74)}_{7,16}) = -G^{(64)}_{6,1}$$
$$D(G^{(76)}_{7,16}) = +G^{(61)}_{6,1}$$
$$D(G^{(80)}_{7,16}) = -G^{(62)}_{6,1}$$
$$D(G^{(82)}_{7,16}) = +G^{(60)}_{6,0}$$
$$D(G^{(92)}_{7,16}) = -G^{(46)}_{6,0} + G^{(49)}_{6,0}$$
$$D(G^{(94)}_{7,16}) = +G^{(43)}_{6,0} - G^{(52)}_{6,0}$$
$$D(G^{(98)}_{7,16}) = -G^{(40)}_{6,0} + G^{(48)}_{6,0}$$
$$D(G^{(100)}_{7,16}) = +G^{(37)}_{6,0} - G^{(50)}_{6,0}$$
$$D(G^{(104)}_{7,16}) = -G^{(38)}_{6,0} + G^{(42)}_{6,0}$$
$$D(G^{(106)}_{7,16}) = +G^{(36)}_{6,0} - G^{(44)}_{6,0}$$
$$D(G^{(116)}_{7,16}) = -G^{(47)}_{6,0} + G^{(51)}_{6,0}$$
$$D(G^{(118)}_{7,16}) = +G^{(45)}_{6,0} - G^{(53)}_{6,0}$$

The Fatgraph $G_{7,17}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0]),   # a
  Vertex([1, 2, 2, 3]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^1c^2 \to {}^0d^1 \to {}^2c^0 \to {}^0b^1)$$
$$\beta = ({}^2a^0 \to {}^1d^2 \to {}^3d^0)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^2d^3)$$

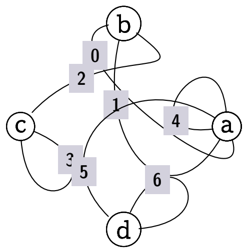
Markings

Fatgraph $G_{7,17}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,17}$ to $G^{(120)}_{7,17}$ are formed by decorating boundary cycles of $G_{7,17}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

$$
\begin{aligned}
D(G^{(0)}_{7,17}) &= -G^{(58)}_{6,0} \\
D(G^{(2)}_{7,17}) &= -G^{(34)}_{6,0} + G^{(50)}_{6,0} \\
D(G^{(4)}_{7,17}) &= +G^{(31)}_{6,0} - G^{(48)}_{6,0} \\
D(G^{(5)}_{7,17}) &= +G^{(55)}_{6,0} \\
D(G^{(6)}_{7,17}) &= -G^{(56)}_{6,0} \\
D(G^{(8)}_{7,17}) &= -G^{(32)}_{6,0} + G^{(44)}_{6,0} \\
D(G^{(10)}_{7,17}) &= +G^{(30)}_{6,0} - G^{(42)}_{6,0} \\
D(G^{(11)}_{7,17}) &= +G^{(54)}_{6,0} \\
D(G^{(16)}_{7,17}) &= +G^{(63)}_{6,1} \\
D(G^{(20)}_{7,17}) &= -G^{(41)}_{6,0} + G^{(53)}_{6,0} \\
D(G^{(22)}_{7,17}) &= +G^{(39)}_{6,0} - G^{(51)}_{6,0} \\
D(G^{(24)}_{7,17}) &= -G^{(59)}_{6,0} \\
D(G^{(26)}_{7,17}) &= -G^{(35)}_{6,0} + G^{(52)}_{6,0} \\
D(G^{(28)}_{7,17}) &= +G^{(33)}_{6,0} - G^{(49)}_{6,0} \\
D(G^{(29)}_{7,17}) &= +G^{(57)}_{6,0}
\end{aligned}
$$

$$
\begin{aligned}
D(G^{(30)}_{7,17}) &= -G^{(54)}_{6,0} + G^{(62)}_{6,1} \\
D(G^{(32)}_{7,17}) &= -G^{(30)}_{6,0} + G^{(38)}_{6,0} \\
D(G^{(34)}_{7,17}) &= +G^{(32)}_{6,0} - G^{(36)}_{6,0} \\
D(G^{(35)}_{7,17}) &= +G^{(56)}_{6,0} - G^{(60)}_{6,0} \\
D(G^{(38)}_{7,17}) &= -G^{(63)}_{6,1} \\
D(G^{(44)}_{7,17}) &= -G^{(39)}_{6,0} + G^{(47)}_{6,0} \\
D(G^{(46)}_{7,17}) &= +G^{(41)}_{6,0} - G^{(45)}_{6,0} \\
D(G^{(48)}_{7,17}) &= -G^{(57)}_{6,0} \\
D(G^{(50)}_{7,17}) &= -G^{(33)}_{6,0} + G^{(46)}_{6,0} \\
D(G^{(52)}_{7,17}) &= +G^{(35)}_{6,0} - G^{(43)}_{6,0} \\
D(G^{(53)}_{7,17}) &= +G^{(59)}_{6,0} \\
D(G^{(54)}_{7,17}) &= -G^{(55)}_{6,0} + G^{(64)}_{6,1} \\
D(G^{(56)}_{7,17}) &= -G^{(31)}_{6,0} + G^{(40)}_{6,0} \\
D(G^{(58)}_{7,17}) &= +G^{(34)}_{6,0} - G^{(37)}_{6,0} \\
D(G^{(59)}_{7,17}) &= +G^{(58)}_{6,0} - G^{(61)}_{6,1}
\end{aligned}
$$

The Fatgraph $G_{7,18}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 5, 4, 1, 0]),# a
  Vertex([0, 1, 2]),      # b
  Vertex([3, 3, 2]),      # c
  Vertex([6, 6, 5]),      # d
])
```

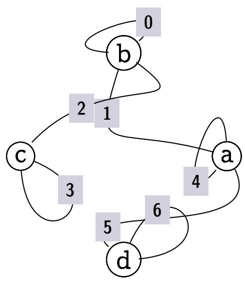
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{1}d^{2}) \\
\beta &= ({}^{2}a^{3} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{4}a^{0} \to {}^{1}b^{2}) \\
\gamma &= ({}^{3}a^{4} \to {}^{0}b^{1}) \\
\delta &= ({}^{0}c^{1}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{7,18}$ only has the identity automorphism, so the marked fatgraphs $G_{7,18}^{(0)}$ to $G_{7,18}^{(120)}$ are formed by decorating boundary cycles of $G_{7,18}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,19}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 4, 5]),# a
  Vertex([0, 1, 2, 0]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

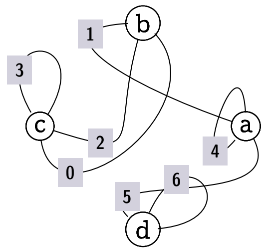
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^2b^3 \to {}^1b^2)$$
$$\beta = ({}^2a^3 \to {}^2d^0 \to {}^3a^0 \to {}^1d^2)$$
$$\gamma = ({}^3b^0)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,19}$ only has the identity automorphism, so the marked fatgraphs $G_{7,19}^{(0)}$ to $G_{7,19}^{(120)}$ are formed by decorating boundary cycles of $G_{7,19}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,20}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 4, 5]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([0, 2, 3, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

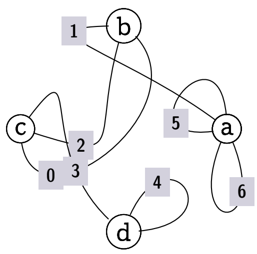
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{2}b^{0}) \\
\beta &= ({}^{2}a^{3} \to {}^{2}d^{0} \to {}^{3}a^{0} \to {}^{1}d^{2}) \\
\gamma &= ({}^{0}c^{1} \to {}^{1}b^{2}) \\
\delta &= ({}^{2}c^{3}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,20}$ only has the identity automorphism, so the marked fatgraphs $G_{7,20}^{(0)}$ to $G_{7,20}^{(120)}$ are formed by decorating boundary cycles of $G_{7,20}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,21}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 5, 6, 6]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([0, 2, 3]),      # c
  Vertex([4, 4, 3]),      # d
])
```

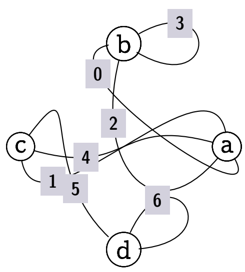
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^2d^0 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1d^2) \\
\beta &= ({}^2a^3 \to {}^4a^0) \\
\gamma &= ({}^3a^4) \\
\delta &= ({}^0c^1 \to {}^1b^2) \\
\epsilon &= ({}^0d^1)
\end{aligned}
$$

Markings

Fatgraph $G_{7,21}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,21}$ to $G^{(120)}_{7,21}$ are formed by decorating boundary cycles of $G_{7,21}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,22}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([0, 2, 3, 3]),# b
  Vertex([1, 4, 5]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

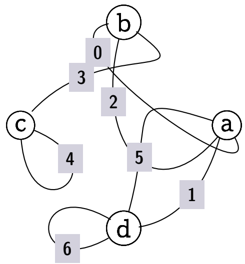
$$
\begin{aligned}
\alpha &= ({}^2d^0 \to {}^0a^1 \to {}^1d^2 \to {}^1c^2 \to {}^2c^0) \\
\beta &= ({}^1a^2 \to {}^3a^0 \to {}^3b^0 \to {}^0c^1 \to {}^1b^2) \\
\gamma &= ({}^2a^3 \to {}^0b^1) \\
\delta &= ({}^2b^3) \\
\epsilon &= ({}^0d^1)
\end{aligned}
$$

Markings

Fatgraph $G_{7,22}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,22}$ to $G^{(120)}_{7,22}$ are formed by decorating boundary cycles of $G_{7,22}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,23}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 5, 2, 0]),# a
  Vertex([0, 2, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6, 6]),# d
])
```

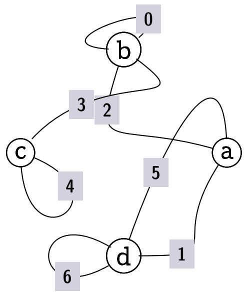
Boundary cycles

$$\alpha = ({}^{3}d^{0} \to {}^{0}a^{1} \to {}^{1}d^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,23}$ only has the identity automorphism, so the marked fatgraphs $G_{7,23}^{(0)}$ to $G_{7,23}^{(120)}$ are formed by decorating boundary cycles of $G_{7,23}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,24}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([0, 2, 3, 0]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6, 6]),# d
])
```

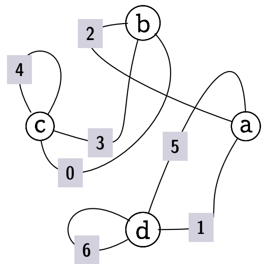
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}d^{1} \to {}^{2}b^{3} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}a^{0} \to {}^{1}d^{2} \to {}^{3}d^{0})$$
$$\gamma = ({}^{3}b^{0})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,24}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,24}$ to $G^{(120)}_{7,24}$ are formed by decorating boundary cycles of $G_{7,24}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,25}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([1, 5, 6, 6]),# d
])
```

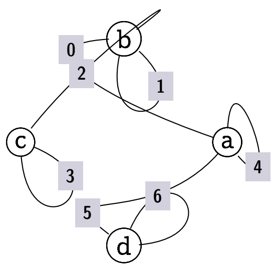
Boundary cycles

$$\alpha = ({}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^3c^0 \to {}^0d^1 \to {}^2b^0)$$
$$\beta = ({}^2a^0 \to {}^1d^2 \to {}^3d^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,25}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,25}$ to $G^{(120)}_{7,25}$ are formed by decorating boundary cycles of $G_{7,25}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,26}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 5, 4]),# a
  Vertex([0, 1, 1, 2]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

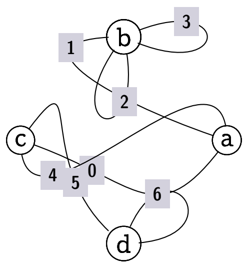
$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^2a^3 \to {}^3b^0 \to {}^1c^2 \to {}^2c^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^3a^0)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,26}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,26}$ to $G^{(120)}_{7,26}$ are formed by decorating boundary cycles of $G_{7,26}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,27}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([1, 2, 2, 3, 3]),# b
  Vertex([4, 0, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

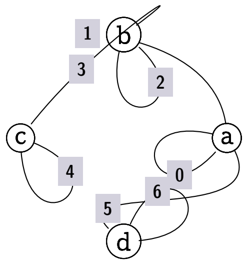
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{4}b^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\beta = ({}^{2}a^{0} \to {}^{0}c^{1})$$
$$\gamma = ({}^{1}b^{2})$$
$$\delta = ({}^{3}b^{4})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,27}$ only has the identity automorphism, so the marked fatgraphs $G_{7,27}^{(0)}$ to $G_{7,27}^{(120)}$ are formed by decorating boundary cycles of $G_{7,27}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,28}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 0, 5]),# a
  Vertex([1, 2, 2, 3]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{3}a^{0} \to {}^{3}b^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{2}b^{3} \to {}^{1}d^{2})$$
$$\beta = ({}^{1}a^{2})$$
$$\gamma = ({}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	2	1	0	5	6	3	4	α	γ	β	ϵ	δ

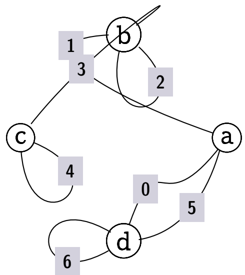
Markings

	$G^{(0)}_{7,28}$	$G^{(1)}_{7,28}$	$G^{(2)}_{7,28}$	$G^{(3)}_{7,28}$	$G^{(4)}_{7,28}$	$G^{(5)}_{7,28}$	$G^{(6)}_{7,28}$	$G^{(7)}_{7,28}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G^{(8)}_{7,28}$	$G^{(9)}_{7,28}$	$G^{(10)}_{7,28}$	$G^{(11)}_{7,28}$	$G^{(12)}_{7,28}$	$G^{(13)}_{7,28}$	$G^{(14)}_{7,28}$	$G^{(15)}_{7,28}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2

(continued.)

	$G_{7,28}^{(16)}$	$G_{7,28}^{(17)}$	$G_{7,28}^{(18)}$	$G_{7,28}^{(19)}$	$G_{7,28}^{(20)}$	$G_{7,28}^{(21)}$	$G_{7,28}^{(22)}$	$G_{7,28}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,28}^{(24)}$	$G_{7,28}^{(25)}$	$G_{7,28}^{(26)}$	$G_{7,28}^{(27)}$	$G_{7,28}^{(28)}$	$G_{7,28}^{(29)}$	$G_{7,28}^{(30)}$	$G_{7,28}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0
	$G_{7,28}^{(32)}$	$G_{7,28}^{(33)}$	$G_{7,28}^{(34)}$	$G_{7,28}^{(35)}$	$G_{7,28}^{(36)}$	$G_{7,28}^{(37)}$	$G_{7,28}^{(38)}$	$G_{7,28}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{7,28}^{(40)}$	$G_{7,28}^{(41)}$	$G_{7,28}^{(42)}$	$G_{7,28}^{(43)}$	$G_{7,28}^{(44)}$	$G_{7,28}^{(45)}$	$G_{7,28}^{(46)}$	$G_{7,28}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{7,28}^{(48)}$	$G_{7,28}^{(49)}$	$G_{7,28}^{(50)}$	$G_{7,28}^{(51)}$	$G_{7,28}^{(52)}$	$G_{7,28}^{(53)}$	$G_{7,28}^{(54)}$	$G_{7,28}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{7,28}^{(56)}$	$G_{7,28}^{(57)}$	$G_{7,28}^{(58)}$	$G_{7,28}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,29}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0]),   # a
  Vertex([1, 2, 2, 3]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 0, 6, 6]),# d
])
```

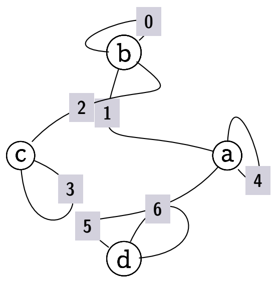
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^1c^2 \to {}^3d^0 \to {}^2c^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0 \to {}^0d^1)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,29}$ only has the identity automorphism, so the marked fatgraphs $G_{7,29}^{(0)}$ to $G_{7,29}^{(120)}$ are formed by decorating boundary cycles of $G_{7,29}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,30}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 5, 4]),# a
  Vertex([0, 1, 2, 0]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^2a^3 \to {}^1c^2 \to {}^2c^0 \to {}^2b^3 \to {}^1d^2 \to {}^1b^2)$$
$$\beta = ({}^3a^0)$$
$$\gamma = ({}^3b^0)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0d^1)$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	4	1	5	6	0	2	3	α	γ	β	ϵ	δ

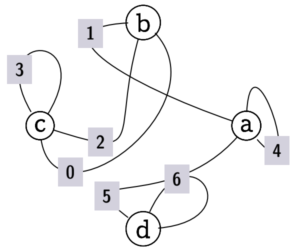
Markings

	$G_{7,30}^{(0)}$	$G_{7,30}^{(1)}$	$G_{7,30}^{(2)}$	$G_{7,30}^{(3)}$	$G_{7,30}^{(4)}$	$G_{7,30}^{(5)}$	$G_{7,30}^{(6)}$	$G_{7,30}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{7,30}^{(8)}$	$G_{7,30}^{(9)}$	$G_{7,30}^{(10)}$	$G_{7,30}^{(11)}$	$G_{7,30}^{(12)}$	$G_{7,30}^{(13)}$	$G_{7,30}^{(14)}$	$G_{7,30}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{7,30}^{(16)}$	$G_{7,30}^{(17)}$	$G_{7,30}^{(18)}$	$G_{7,30}^{(19)}$	$G_{7,30}^{(20)}$	$G_{7,30}^{(21)}$	$G_{7,30}^{(22)}$	$G_{7,30}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,30}^{(24)}$	$G_{7,30}^{(25)}$	$G_{7,30}^{(26)}$	$G_{7,30}^{(27)}$	$G_{7,30}^{(28)}$	$G_{7,30}^{(29)}$	$G_{7,30}^{(30)}$	$G_{7,30}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

(continued.)

	$G_{7,30}^{(32)}$	$G_{7,30}^{(33)}$	$G_{7,30}^{(34)}$	$G_{7,30}^{(35)}$	$G_{7,30}^{(36)}$	$G_{7,30}^{(37)}$	$G_{7,30}^{(38)}$	$G_{7,30}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{7,30}^{(40)}$	$G_{7,30}^{(41)}$	$G_{7,30}^{(42)}$	$G_{7,30}^{(43)}$	$G_{7,30}^{(44)}$	$G_{7,30}^{(45)}$	$G_{7,30}^{(46)}$	$G_{7,30}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{7,30}^{(48)}$	$G_{7,30}^{(49)}$	$G_{7,30}^{(50)}$	$G_{7,30}^{(51)}$	$G_{7,30}^{(52)}$	$G_{7,30}^{(53)}$	$G_{7,30}^{(54)}$	$G_{7,30}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{7,30}^{(56)}$	$G_{7,30}^{(57)}$	$G_{7,30}^{(58)}$	$G_{7,30}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,31}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 5, 4]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([0, 2, 3, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

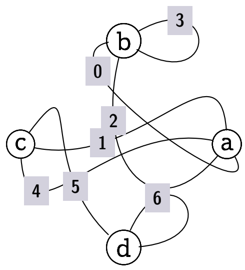
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^2a^3 \to {}^3c^0 \to {}^2b^0 \to {}^1d^2)$$
$$\beta = ({}^3a^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,31}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,31}$ to $G^{(120)}_{7,31}$ are formed by decorating boundary cycles of $G_{7,31}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,32}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([0, 2, 3, 3]),# b
  Vertex([4, 1, 5]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

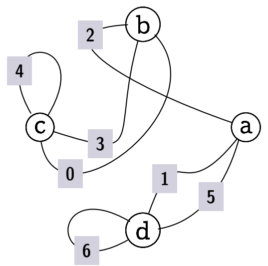
$$\alpha = ({}^0a^1 \to {}^0c^1)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^1b^2 \to {}^3a^0 \to {}^3b^0 \to {}^1c^2 \to {}^2c^0 \to {}^1d^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1)$$
$$\delta = ({}^2b^3)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,32}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,32}$ to $G^{(120)}_{7,32}$ are formed by decorating boundary cycles of $G_{7,32}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,33}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([5, 1, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{3}d^{0} \to {}^{2}b^{0} \to {}^{1}d^{2})$$
$$\beta = ({}^{2}a^{0} \to {}^{0}d^{1})$$
$$\gamma = ({}^{0}c^{1} \to {}^{1}b^{2})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{2}d^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	5	3	2	1	6	0	4	α	γ	β	ϵ	δ

Markings

	$G^{(0)}_{7,33}$	$G^{(1)}_{7,33}$	$G^{(2)}_{7,33}$	$G^{(3)}_{7,33}$	$G^{(4)}_{7,33}$	$G^{(5)}_{7,33}$	$G^{(6)}_{7,33}$	$G^{(7)}_{7,33}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1

(continued.)

	$G_{7,33}^{(8)}$	$G_{7,33}^{(9)}$	$G_{7,33}^{(10)}$	$G_{7,33}^{(11)}$	$G_{7,33}^{(12)}$	$G_{7,33}^{(13)}$	$G_{7,33}^{(14)}$	$G_{7,33}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2

	$G_{7,33}^{(16)}$	$G_{7,33}^{(17)}$	$G_{7,33}^{(18)}$	$G_{7,33}^{(19)}$	$G_{7,33}^{(20)}$	$G_{7,33}^{(21)}$	$G_{7,33}^{(22)}$	$G_{7,33}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0

	$G_{7,33}^{(24)}$	$G_{7,33}^{(25)}$	$G_{7,33}^{(26)}$	$G_{7,33}^{(27)}$	$G_{7,33}^{(28)}$	$G_{7,33}^{(29)}$	$G_{7,33}^{(30)}$	$G_{7,33}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

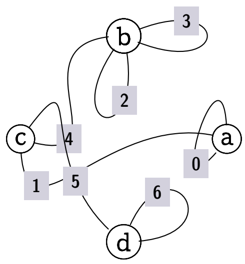
	$G_{7,33}^{(32)}$	$G_{7,33}^{(33)}$	$G_{7,33}^{(34)}$	$G_{7,33}^{(35)}$	$G_{7,33}^{(36)}$	$G_{7,33}^{(37)}$	$G_{7,33}^{(38)}$	$G_{7,33}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1

	$G_{7,33}^{(40)}$	$G_{7,33}^{(41)}$	$G_{7,33}^{(42)}$	$G_{7,33}^{(43)}$	$G_{7,33}^{(44)}$	$G_{7,33}^{(45)}$	$G_{7,33}^{(46)}$	$G_{7,33}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0

	$G_{7,33}^{(48)}$	$G_{7,33}^{(49)}$	$G_{7,33}^{(50)}$	$G_{7,33}^{(51)}$	$G_{7,33}^{(52)}$	$G_{7,33}^{(53)}$	$G_{7,33}^{(54)}$	$G_{7,33}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0

	$G_{7,33}^{(56)}$	$G_{7,33}^{(57)}$	$G_{7,33}^{(58)}$	$G_{7,33}^{(59)}$
α	4	4	4	4
β	1	1	2	2
γ	3	3	3	3
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{7,34}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),      # a
  Vertex([4, 2, 2, 3, 3]),# b
  Vertex([1, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

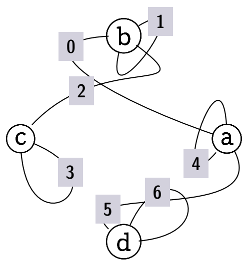
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}d^{0} \to {}^{4}b^{0} \to {}^{0}c^{1} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}b^{1} \to {}^{1}d^{2}) \\
\beta &= ({}^{2}a^{0}) \\
\gamma &= ({}^{1}b^{2}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,34}$ only has the identity automorphism, so the marked fatgraphs $G_{7,34}^{(0)}$ to $G_{7,34}^{(120)}$ are formed by decorating boundary cycles of $G_{7,34}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,35}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([4, 0, 4, 5]),# a
  Vertex([0, 1, 2, 1]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{3}b^{0} \to {}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{2}a^{3} \to {}^{2}d^{0} \to {}^{3}a^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}b^{3} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	0	4	5	6	1	2	3	α	γ	β	ϵ	δ

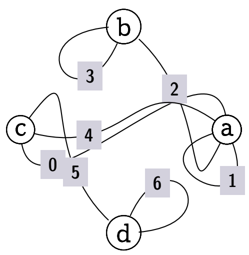
Markings

	$G_{7,35}^{(0)}$	$G_{7,35}^{(1)}$	$G_{7,35}^{(2)}$	$G_{7,35}^{(3)}$	$G_{7,35}^{(4)}$	$G_{7,35}^{(5)}$	$G_{7,35}^{(6)}$	$G_{7,35}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{7,35}^{(8)}$	$G_{7,35}^{(9)}$	$G_{7,35}^{(10)}$	$G_{7,35}^{(11)}$	$G_{7,35}^{(12)}$	$G_{7,35}^{(13)}$	$G_{7,35}^{(14)}$	$G_{7,35}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{7,35}^{(16)}$	$G_{7,35}^{(17)}$	$G_{7,35}^{(18)}$	$G_{7,35}^{(19)}$	$G_{7,35}^{(20)}$	$G_{7,35}^{(21)}$	$G_{7,35}^{(22)}$	$G_{7,35}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,35}^{(24)}$	$G_{7,35}^{(25)}$	$G_{7,35}^{(26)}$	$G_{7,35}^{(27)}$	$G_{7,35}^{(28)}$	$G_{7,35}^{(29)}$	$G_{7,35}^{(30)}$	$G_{7,35}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

(continued.)

	$G_{7,35}^{(32)}$	$G_{7,35}^{(33)}$	$G_{7,35}^{(34)}$	$G_{7,35}^{(35)}$	$G_{7,35}^{(36)}$	$G_{7,35}^{(37)}$	$G_{7,35}^{(38)}$	$G_{7,35}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{7,35}^{(40)}$	$G_{7,35}^{(41)}$	$G_{7,35}^{(42)}$	$G_{7,35}^{(43)}$	$G_{7,35}^{(44)}$	$G_{7,35}^{(45)}$	$G_{7,35}^{(46)}$	$G_{7,35}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{7,35}^{(48)}$	$G_{7,35}^{(49)}$	$G_{7,35}^{(50)}$	$G_{7,35}^{(51)}$	$G_{7,35}^{(52)}$	$G_{7,35}^{(53)}$	$G_{7,35}^{(54)}$	$G_{7,35}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{7,35}^{(56)}$	$G_{7,35}^{(57)}$	$G_{7,35}^{(58)}$	$G_{7,35}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,36}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 4, 1, 2, 1]),# a
  Vertex([3, 3, 2]),      # b
  Vertex([0, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

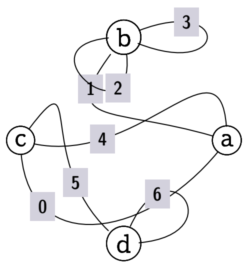
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1d^2 \to {}^1c^2 \to {}^2c^0)$$
$$\beta = ({}^1a^2 \to {}^0c^1 \to {}^4a^0)$$
$$\gamma = ({}^2a^3 \to {}^2b^0 \to {}^3a^4 \to {}^1b^2)$$
$$\delta = ({}^0b^1)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,36}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,36}$ to $G^{(120)}_{7,36}$ are formed by decorating boundary cycles of $G_{7,36}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,37}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([2, 1, 2, 3, 3]),# b
  Vertex([0, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

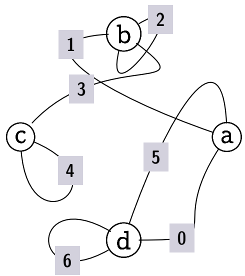
$$\alpha = ({}^1a^2 \to {}^0b^1 \to {}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^2a^0 \to {}^1d^2 \to {}^1c^2 \to {}^2c^0)$$
$$\gamma = ({}^4b^0 \to {}^2b^3)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,37}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,37}$ to $G^{(120)}_{7,37}$ are formed by decorating boundary cycles of $G_{7,37}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,38}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0]),   # a
  Vertex([1, 2, 3, 2]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6, 6]),# d
])
```

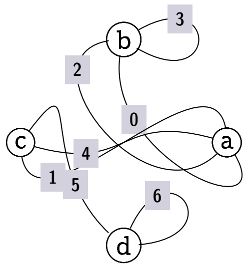
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^1a^2 \to {}^0d^1 \to {}^3b^0 \to {}^0a^1 \to {}^0b^1) \\
\beta &= ({}^2a^0 \to {}^1d^2 \to {}^3d^0) \\
\gamma &= ({}^2b^3 \to {}^2c^0 \to {}^1c^2 \to {}^1b^2) \\
\delta &= ({}^0c^1) \\
\epsilon &= ({}^2d^3)
\end{aligned}$$

Markings

Fatgraph $G_{7,38}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,38}$ to $G^{(120)}_{7,38}$ are formed by decorating boundary cycles of $G_{7,38}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,39}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 2, 0]),# a
  Vertex([2, 0, 3, 3]),# b
  Vertex([1, 4, 5]),   # c
  Vertex([6, 6, 5]),   # d
])
```

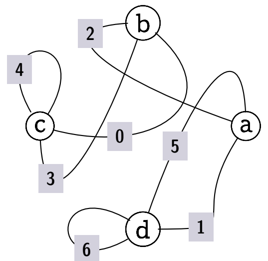
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}d^{2} \to {}^{1}c^{2} \to {}^{2}c^{0})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}a^{0} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{3} \to {}^{3}b^{0} \to {}^{1}b^{2})$$
$$\delta = ({}^{2}b^{3})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,39}$ only has the identity automorphism, so the marked fatgraphs $G_{7,39}^{(0)}$ to $G_{7,39}^{(120)}$ are formed by decorating boundary cycles of $G_{7,39}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,40}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([3, 0, 4, 4]),# c
  Vertex([1, 5, 6, 6]),# d
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{0}c^{1} \to {}^{0}d^{1} \to {}^{2}b^{0}) \\
\beta &= ({}^{2}a^{0} \to {}^{1}d^{2} \to {}^{3}d^{0}) \\
\gamma &= ({}^{3}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2}) \\
\delta &= ({}^{2}c^{3}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	5	3	2	1	6	0	4	α	γ	β	ϵ	δ

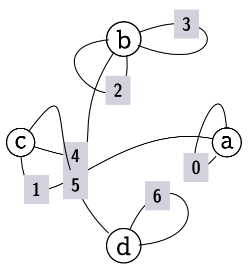
Markings

	$G_{7,40}^{(0)}$	$G_{7,40}^{(1)}$	$G_{7,40}^{(2)}$	$G_{7,40}^{(3)}$	$G_{7,40}^{(4)}$	$G_{7,40}^{(5)}$	$G_{7,40}^{(6)}$	$G_{7,40}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{7,40}^{(8)}$	$G_{7,40}^{(9)}$	$G_{7,40}^{(10)}$	$G_{7,40}^{(11)}$	$G_{7,40}^{(12)}$	$G_{7,40}^{(13)}$	$G_{7,40}^{(14)}$	$G_{7,40}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{7,40}^{(16)}$	$G_{7,40}^{(17)}$	$G_{7,40}^{(18)}$	$G_{7,40}^{(19)}$	$G_{7,40}^{(20)}$	$G_{7,40}^{(21)}$	$G_{7,40}^{(22)}$	$G_{7,40}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,40}^{(24)}$	$G_{7,40}^{(25)}$	$G_{7,40}^{(26)}$	$G_{7,40}^{(27)}$	$G_{7,40}^{(28)}$	$G_{7,40}^{(29)}$	$G_{7,40}^{(30)}$	$G_{7,40}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

(continued.)

	$G_{7,40}^{(32)}$	$G_{7,40}^{(33)}$	$G_{7,40}^{(34)}$	$G_{7,40}^{(35)}$	$G_{7,40}^{(36)}$	$G_{7,40}^{(37)}$	$G_{7,40}^{(38)}$	$G_{7,40}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{7,40}^{(40)}$	$G_{7,40}^{(41)}$	$G_{7,40}^{(42)}$	$G_{7,40}^{(43)}$	$G_{7,40}^{(44)}$	$G_{7,40}^{(45)}$	$G_{7,40}^{(46)}$	$G_{7,40}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{7,40}^{(48)}$	$G_{7,40}^{(49)}$	$G_{7,40}^{(50)}$	$G_{7,40}^{(51)}$	$G_{7,40}^{(52)}$	$G_{7,40}^{(53)}$	$G_{7,40}^{(54)}$	$G_{7,40}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{7,40}^{(56)}$	$G_{7,40}^{(57)}$	$G_{7,40}^{(58)}$	$G_{7,40}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,41}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),       # a
  Vertex([2, 4, 2, 3, 3]),# b
  Vertex([1, 4, 5]),       # c
  Vertex([6, 6, 5]),       # d
])
```

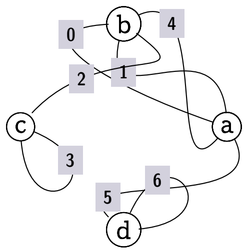
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0c^1 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^1b^2 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^4b^0 \to {}^2b^3)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,41}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,41}$ to $G^{(120)}_{7,41}$ are formed by decorating boundary cycles of $G_{7,41}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,42}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 4, 5]),# a
  Vertex([0, 1, 2, 4]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^3b^0)$$
$$\gamma = ({}^2d^0 \to {}^2b^3 \to {}^2a^3 \to {}^2c^0 \to {}^3a^0 \to {}^1c^2 \to {}^1b^2 \to {}^1d^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0d^1)$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	0	4	5	6	1	2	3	β	α	γ	ϵ	δ

Markings

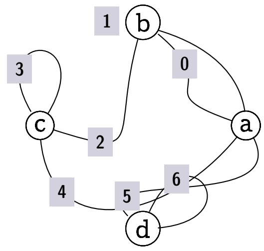
	$G_{7,42}^{(0)}$	$G_{7,42}^{(1)}$	$G_{7,42}^{(2)}$	$G_{7,42}^{(3)}$	$G_{7,42}^{(4)}$	$G_{7,42}^{(5)}$	$G_{7,42}^{(6)}$	$G_{7,42}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{7,42}^{(8)}$	$G_{7,42}^{(9)}$	$G_{7,42}^{(10)}$	$G_{7,42}^{(11)}$	$G_{7,42}^{(12)}$	$G_{7,42}^{(13)}$	$G_{7,42}^{(14)}$	$G_{7,42}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{7,42}^{(16)}$	$G_{7,42}^{(17)}$	$G_{7,42}^{(18)}$	$G_{7,42}^{(19)}$	$G_{7,42}^{(20)}$	$G_{7,42}^{(21)}$	$G_{7,42}^{(22)}$	$G_{7,42}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{7,42}^{(24)}$	$G_{7,42}^{(25)}$	$G_{7,42}^{(26)}$	$G_{7,42}^{(27)}$	$G_{7,42}^{(28)}$	$G_{7,42}^{(29)}$	$G_{7,42}^{(30)}$	$G_{7,42}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{7,42}^{(32)}$	$G_{7,42}^{(33)}$	$G_{7,42}^{(34)}$	$G_{7,42}^{(35)}$	$G_{7,42}^{(36)}$	$G_{7,42}^{(37)}$	$G_{7,42}^{(38)}$	$G_{7,42}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{7,42}^{(40)}$	$G_{7,42}^{(41)}$	$G_{7,42}^{(42)}$	$G_{7,42}^{(43)}$	$G_{7,42}^{(44)}$	$G_{7,42}^{(45)}$	$G_{7,42}^{(46)}$	$G_{7,42}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{7,42}^{(48)}$	$G_{7,42}^{(49)}$	$G_{7,42}^{(50)}$	$G_{7,42}^{(51)}$	$G_{7,42}^{(52)}$	$G_{7,42}^{(53)}$	$G_{7,42}^{(54)}$	$G_{7,42}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0

(continued.)

δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1

	$G_{7,42}^{(56)}$	$G_{7,42}^{(57)}$	$G_{7,42}^{(58)}$	$G_{7,42}^{(59)}$
α	3	3	3	3
β	4	4	4	4
γ	1	1	2	2
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{7,43}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 4, 5]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([4, 2, 3, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

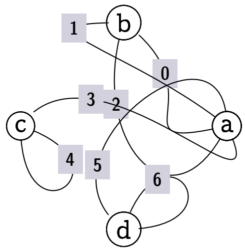
Boundary cycles

$$\alpha = ({}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^0c^1 \to {}^1b^2)$$
$$\gamma = ({}^2d^0 \to {}^3c^0 \to {}^2a^3 \to {}^0b^1 \to {}^3a^0 \to {}^1c^2 \to {}^1d^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,43}$ only has the identity automorphism, so the marked fatgraphs $G_{7,43}^{(0)}$ to $G_{7,43}^{(120)}$ are formed by decorating boundary cycles of $G_{7,43}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,44}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 4, 3]),      # c
  Vertex([6, 6, 5]),      # d
])
```

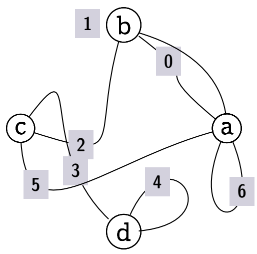
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{3}a^{4} \to {}^{0}a^{1} \to {}^{4}a^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{0})$$
$$\gamma = ({}^{2}a^{3} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,44}$ only has the identity automorphism, so the marked fatgraphs $G_{7,44}^{(0)}$ to $G_{7,44}^{(120)}$ are formed by decorating boundary cycles of $G_{7,44}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,45}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 6, 6]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([5, 2, 3]),      # c
  Vertex([4, 4, 3]),      # d
])
```

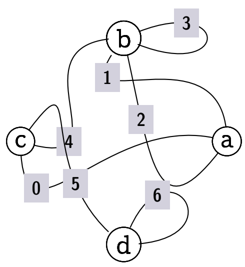
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{4}a^{0} \to {}^{1}d^{2})$$
$$\delta = ({}^{3}a^{4})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,45}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,45}$ to $G^{(120)}_{7,45}$ are formed by decorating boundary cycles of $G_{7,45}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,46}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([4, 1, 2, 3, 3]),# b
  Vertex([0, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

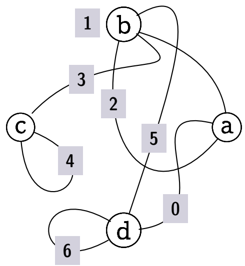
$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{2}d^{0} \to {}^{4}b^{0} \to {}^{1}a^{2} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{1}b^{2})$$
$$\delta = ({}^{3}b^{4})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,46}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,46}$ to $G^{(120)}_{7,46}$ are formed by decorating boundary cycles of $G_{7,46}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,47}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([1, 2, 3, 5]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6, 6]),# d
])
```

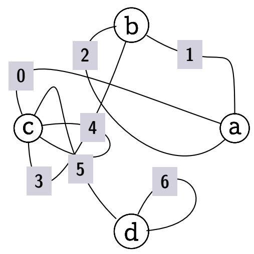
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}d^{1} \to {}^{3}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{3}d^{0} \to {}^{2}c^{0} \to {}^{1}d^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}b^{1}) \\
\delta &= ({}^{0}c^{1}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

Fatgraph $G_{7,47}$ only has the identity automorphism, so the marked fatgraphs $G_{7,47}^{(0)}$ to $G_{7,47}^{(120)}$ are formed by decorating boundary cycles of $G_{7,47}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,48}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([2, 3, 1]),      # b
  Vertex([3, 4, 4, 5, 0]),# c
  Vertex([6, 6, 5]),      # d
])
```

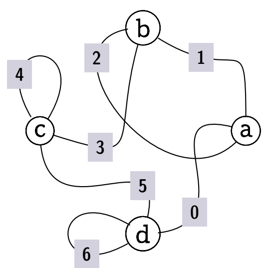
Boundary cycles

$$\alpha = ({}^{4}c^{0} \to {}^{0}a^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{3}c^{4} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{0}c^{1} \to {}^{2}c^{3} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{1}c^{2})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,48}$ only has the identity automorphism, so the marked fatgraphs $G_{7,48}^{(0)}$ to $G_{7,48}^{(120)}$ are formed by decorating boundary cycles of $G_{7,48}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,49}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([5, 3, 4, 4]),# c
  Vertex([0, 5, 6, 6]),# d
])
```

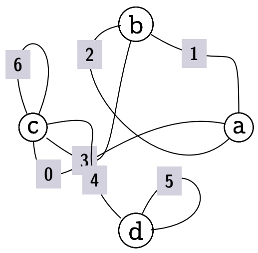
Boundary cycles

$$\alpha = ({}^0d^1 \to {}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1c^2 \to {}^1a^2 \to {}^0b^1 \to {}^3c^0 \to {}^3d^0 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,49}$ only has the identity automorphism, so the marked fatgraphs $G_{7,49}^{(0)}$ to $G_{7,49}^{(120)}$ are formed by decorating boundary cycles of $G_{7,49}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,50}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([2, 3, 1]),      # b
  Vertex([0, 3, 4, 6, 6]),# c
  Vertex([5, 5, 4]),      # d
])
```

Boundary cycles

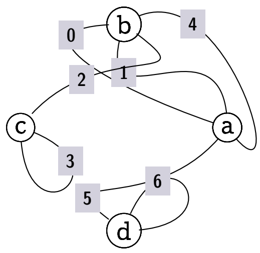
$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^4c^0 \to {}^1a^2 \to {}^0b^1 \to {}^1c^2 \to {}^2c^3 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^3c^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,50}$ only has the identity automorphism, so the marked fatgraphs $G_{7,50}^{(0)}$ to $G_{7,50}^{(120)}$ are formed by decorating boundary cycles of $G_{7,50}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,51}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 4]),# a
  Vertex([0, 1, 2, 4]),# b
  Vertex([3, 3, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}d^{0} \to {}^{3}b^{0} \to {}^{1}d^{2} \to {}^{2}a^{3})$$
$$\gamma = ({}^{3}a^{0} \to {}^{2}b^{3} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	1	0	5	6	4	2	3	α	γ	β	ϵ	δ

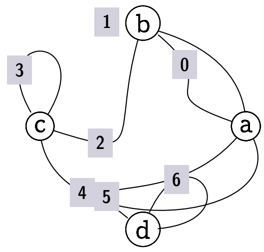
Markings

	$G^{(0)}_{7,51}$	$G^{(1)}_{7,51}$	$G^{(2)}_{7,51}$	$G^{(3)}_{7,51}$	$G^{(4)}_{7,51}$	$G^{(5)}_{7,51}$	$G^{(6)}_{7,51}$	$G^{(7)}_{7,51}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1

(continued.)

	$G_{7,51}^{(8)}$	$G_{7,51}^{(9)}$	$G_{7,51}^{(10)}$	$G_{7,51}^{(11)}$	$G_{7,51}^{(12)}$	$G_{7,51}^{(13)}$	$G_{7,51}^{(14)}$	$G_{7,51}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{7,51}^{(16)}$	$G_{7,51}^{(17)}$	$G_{7,51}^{(18)}$	$G_{7,51}^{(19)}$	$G_{7,51}^{(20)}$	$G_{7,51}^{(21)}$	$G_{7,51}^{(22)}$	$G_{7,51}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,51}^{(24)}$	$G_{7,51}^{(25)}$	$G_{7,51}^{(26)}$	$G_{7,51}^{(27)}$	$G_{7,51}^{(28)}$	$G_{7,51}^{(29)}$	$G_{7,51}^{(30)}$	$G_{7,51}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0
	$G_{7,51}^{(32)}$	$G_{7,51}^{(33)}$	$G_{7,51}^{(34)}$	$G_{7,51}^{(35)}$	$G_{7,51}^{(36)}$	$G_{7,51}^{(37)}$	$G_{7,51}^{(38)}$	$G_{7,51}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{7,51}^{(40)}$	$G_{7,51}^{(41)}$	$G_{7,51}^{(42)}$	$G_{7,51}^{(43)}$	$G_{7,51}^{(44)}$	$G_{7,51}^{(45)}$	$G_{7,51}^{(46)}$	$G_{7,51}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{7,51}^{(48)}$	$G_{7,51}^{(49)}$	$G_{7,51}^{(50)}$	$G_{7,51}^{(51)}$	$G_{7,51}^{(52)}$	$G_{7,51}^{(53)}$	$G_{7,51}^{(54)}$	$G_{7,51}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{7,51}^{(56)}$	$G_{7,51}^{(57)}$	$G_{7,51}^{(58)}$	$G_{7,51}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,52}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 4]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([4, 2, 3, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

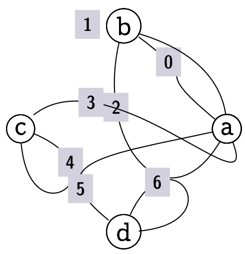
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{1}b^{2} \to {}^{2}a^{3} \to {}^{0}c^{1} \to {}^{1}d^{2}) \\
\gamma &= ({}^{3}a^{0} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\delta &= ({}^{2}c^{3}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,52}$ only has the identity automorphism, so the marked fatgraphs $G_{7,52}^{(0)}$ to $G_{7,52}^{(120)}$ are formed by decorating boundary cycles of $G_{7,52}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,53}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 2, 3]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 4, 3]),      # c
  Vertex([6, 6, 5]),      # d
])
```

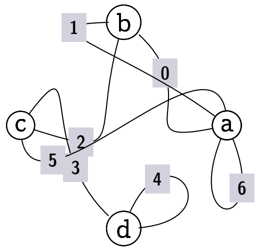
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}d^{0} \to {}^{1}b^{2} \to {}^{1}d^{2} \to {}^{2}a^{3}) \\
\gamma &= ({}^{0}b^{1} \to {}^{4}a^{0} \to {}^{3}a^{4} \to {}^{1}c^{2} \to {}^{2}c^{0}) \\
\delta &= ({}^{0}c^{1}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,53}$ only has the identity automorphism, so the marked fatgraphs $G_{7,53}^{(0)}$ to $G_{7,53}^{(120)}$ are formed by decorating boundary cycles of $G_{7,53}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,54}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0, 6, 6]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([5, 2, 3]),      # c
  Vertex([4, 4, 3]),      # d
])
```

Boundary cycles

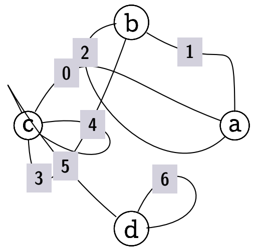
$$\begin{aligned}
\alpha &= ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1} \to {}^{1}d^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}b^{0}) \\
\gamma &= ({}^{2}a^{3} \to {}^{1}b^{2} \to {}^{0}c^{1} \to {}^{4}a^{0}) \\
\delta &= ({}^{3}a^{4}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,54}$ only has the identity automorphism, so the marked fatgraphs $G_{7,54}^{(0)}$ to $G_{7,54}^{(120)}$ are formed by decorating boundary cycles of $G_{7,54}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,55}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([2, 3, 1]),      # b
  Vertex([3, 4, 4, 0, 5]),# c
  Vertex([6, 6, 5]),      # d
])
```

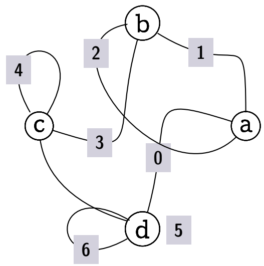
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^4c^0 \to {}^0a^1 \to {}^1b^2 \to {}^3c^4 \to {}^1d^2)$$
$$\beta = ({}^1a^2 \to {}^2c^3 \to {}^0c^1 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^1c^2)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,55}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,55}$ to $G^{(120)}_{7,55}$ are formed by decorating boundary cycles of $G_{7,55}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,56}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([5, 3, 4, 4]),# c
  Vertex([5, 0, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^3d^0 \to {}^0a^1 \to {}^1d^2 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^0d^1 \to {}^3c^0 \to {}^1c^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^2d^3)$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	3	2	1	0	6	5	4	β	α	γ	ϵ	δ

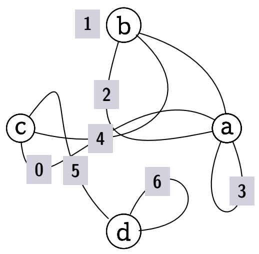
Markings

	$G^{(0)}_{7,56}$	$G^{(1)}_{7,56}$	$G^{(2)}_{7,56}$	$G^{(3)}_{7,56}$	$G^{(4)}_{7,56}$	$G^{(5)}_{7,56}$	$G^{(6)}_{7,56}$	$G^{(7)}_{7,56}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{7,56}$	$G^{(9)}_{7,56}$	$G^{(10)}_{7,56}$	$G^{(11)}_{7,56}$	$G^{(12)}_{7,56}$	$G^{(13)}_{7,56}$	$G^{(14)}_{7,56}$	$G^{(15)}_{7,56}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{7,56}^{(16)}$	$G_{7,56}^{(17)}$	$G_{7,56}^{(18)}$	$G_{7,56}^{(19)}$	$G_{7,56}^{(20)}$	$G_{7,56}^{(21)}$	$G_{7,56}^{(22)}$	$G_{7,56}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{7,56}^{(24)}$	$G_{7,56}^{(25)}$	$G_{7,56}^{(26)}$	$G_{7,56}^{(27)}$	$G_{7,56}^{(28)}$	$G_{7,56}^{(29)}$	$G_{7,56}^{(30)}$	$G_{7,56}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{7,56}^{(32)}$	$G_{7,56}^{(33)}$	$G_{7,56}^{(34)}$	$G_{7,56}^{(35)}$	$G_{7,56}^{(36)}$	$G_{7,56}^{(37)}$	$G_{7,56}^{(38)}$	$G_{7,56}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{7,56}^{(40)}$	$G_{7,56}^{(41)}$	$G_{7,56}^{(42)}$	$G_{7,56}^{(43)}$	$G_{7,56}^{(44)}$	$G_{7,56}^{(45)}$	$G_{7,56}^{(46)}$	$G_{7,56}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{7,56}^{(48)}$	$G_{7,56}^{(49)}$	$G_{7,56}^{(50)}$	$G_{7,56}^{(51)}$	$G_{7,56}^{(52)}$	$G_{7,56}^{(53)}$	$G_{7,56}^{(54)}$	$G_{7,56}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{7,56}^{(56)}$	$G_{7,56}^{(57)}$	$G_{7,56}^{(58)}$	$G_{7,56}^{(59)}$				
α	3	3	3	3				
β	4	4	4	4				
γ	1	1	2	2				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,57}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3, 3]),# a
  Vertex([1, 2, 4]),      # b
  Vertex([0, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

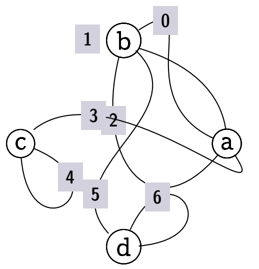
Boundary cycles

$$\alpha = ({}^2b^0 \to {}^0a^1 \to {}^0c^1)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^2c^0 \to {}^1c^2 \to {}^1b^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1 \to {}^4a^0)$$
$$\delta = ({}^3a^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,57}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,57}$ to $G^{(120)}_{7,57}$ are formed by decorating boundary cycles of $G_{7,57}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,58}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 5, 0]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([6, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^3b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^2d^0 \to {}^2b^3 \to {}^1d^2 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^3a^0 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0d^1)$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	1	0	2	5	6	3	4	α	γ	β	ϵ	δ

Markings

	$G_{7,58}^{(0)}$	$G_{7,58}^{(1)}$	$G_{7,58}^{(2)}$	$G_{7,58}^{(3)}$	$G_{7,58}^{(4)}$	$G_{7,58}^{(5)}$	$G_{7,58}^{(6)}$	$G_{7,58}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{7,58}^{(8)}$	$G_{7,58}^{(9)}$	$G_{7,58}^{(10)}$	$G_{7,58}^{(11)}$	$G_{7,58}^{(12)}$	$G_{7,58}^{(13)}$	$G_{7,58}^{(14)}$	$G_{7,58}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{7,58}^{(16)}$	$G_{7,58}^{(17)}$	$G_{7,58}^{(18)}$	$G_{7,58}^{(19)}$	$G_{7,58}^{(20)}$	$G_{7,58}^{(21)}$	$G_{7,58}^{(22)}$	$G_{7,58}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,58}^{(24)}$	$G_{7,58}^{(25)}$	$G_{7,58}^{(26)}$	$G_{7,58}^{(27)}$	$G_{7,58}^{(28)}$	$G_{7,58}^{(29)}$	$G_{7,58}^{(30)}$	$G_{7,58}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0

(continued.)

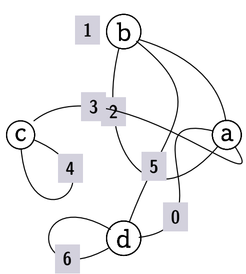
	$G_{7,58}^{(32)}$	$G_{7,58}^{(33)}$	$G_{7,58}^{(34)}$	$G_{7,58}^{(35)}$	$G_{7,58}^{(36)}$	$G_{7,58}^{(37)}$	$G_{7,58}^{(38)}$	$G_{7,58}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1

	$G_{7,58}^{(40)}$	$G_{7,58}^{(41)}$	$G_{7,58}^{(42)}$	$G_{7,58}^{(43)}$	$G_{7,58}^{(44)}$	$G_{7,58}^{(45)}$	$G_{7,58}^{(46)}$	$G_{7,58}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0

	$G_{7,58}^{(48)}$	$G_{7,58}^{(49)}$	$G_{7,58}^{(50)}$	$G_{7,58}^{(51)}$	$G_{7,58}^{(52)}$	$G_{7,58}^{(53)}$	$G_{7,58}^{(54)}$	$G_{7,58}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0

	$G_{7,58}^{(56)}$	$G_{7,58}^{(57)}$	$G_{7,58}^{(58)}$	$G_{7,58}^{(59)}$
α	4	4	4	4
β	1	1	2	2
γ	3	3	3	3
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{7,59}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 5]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6, 6]),# d
])
```

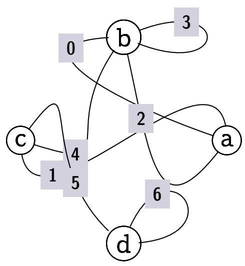
Boundary cycles

$$\alpha = ({}^0d^1 \to {}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^3d^0 \to {}^1d^2 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^3a^0 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,59}$ only has the identity automorphism, so the marked fatgraphs $G_{7,59}^{(0)}$ to $G_{7,59}^{(120)}$ are formed by decorating boundary cycles of $G_{7,59}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,60}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([0, 4, 2, 3, 3]),# b
  Vertex([1, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

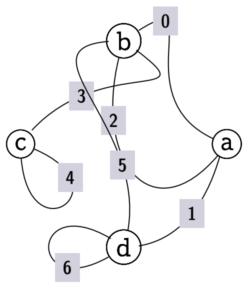
$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^1a^2 \to {}^4b^0 \to {}^2b^3)$$
$$\gamma = ({}^2a^0 \to {}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^3b^4)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,60}$ only has the identity automorphism, so the marked fatgraphs $G_{7,60}^{(0)}$ to $G_{7,60}^{(120)}$ are formed by decorating boundary cycles of $G_{7,60}$ with all

permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,61}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([5, 2, 3, 0]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6, 6]),# d
])
```

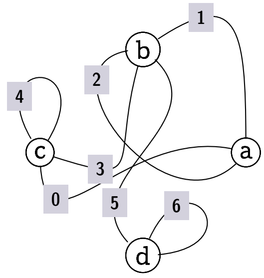
Boundary cycles

$$\alpha = ({}^{3}d^{0} \to {}^{3}b^{0} \to {}^{0}a^{1} \to {}^{1}d^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{3} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}b^{1} \to {}^{0}d^{1})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,61}$ only has the identity automorphism, so the marked fatgraphs $G_{7,61}^{(0)}$ to $G_{7,61}^{(120)}$ are formed by decorating boundary cycles of $G_{7,61}$ with all permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,62}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 5, 1]),# b
  Vertex([0, 3, 4, 4]),# c
  Vertex([6, 6, 5]),   # d
])
```

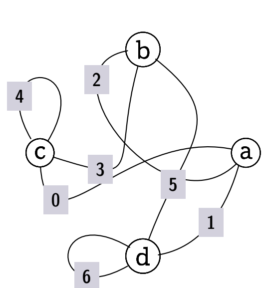
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^2d^0 \to {}^0a^1 \to {}^2b^3 \to {}^0c^1 \to {}^1b^2 \to {}^1d^2) \\
\beta &= ({}^1a^2 \to {}^3c^0 \to {}^1c^2 \to {}^0b^1) \\
\gamma &= ({}^2a^0 \to {}^3b^0) \\
\delta &= ({}^2c^3) \\
\epsilon &= ({}^0d^1)
\end{aligned}$$

Markings

Fatgraph $G_{7,62}$ only has the identity automorphism, so the marked fatgraphs $G_{7,62}^{(0)}$ to $G_{7,62}^{(120)}$ are formed by decorating boundary cycles of $G_{7,62}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,63}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 5]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([1, 5, 6, 6]),# d
])
```

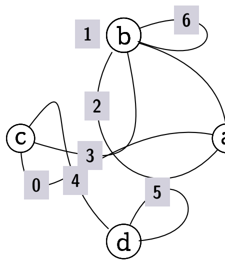
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{3}d^{0} \to {}^{0}a^{1} \to {}^{1}d^{2} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0} \to {}^{0}d^{1}) \\
\delta &= ({}^{2}c^{3}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

Fatgraph $G_{7,63}$ only has the identity automorphism, so the marked fatgraphs $G_{7,63}^{(0)}$ to $G_{7,63}^{(120)}$ are formed by decorating boundary cycles of $G_{7,63}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,64}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([1, 2, 3, 6, 6]),# b
  Vertex([0, 3, 4]),      # c
  Vertex([5, 5, 4]),      # d
])
```

Boundary cycles

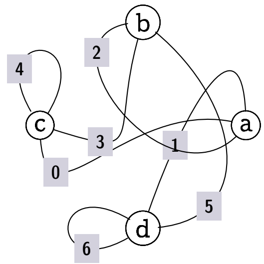
$$\begin{aligned}
\alpha &= ({}^{4}b^{0} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{2}b^{3}) \\
\beta &= ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2} \to {}^{1}d^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}b^{1}) \\
\delta &= ({}^{3}b^{4}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,64}$ only has the identity automorphism, so the marked fatgraphs $G_{7,64}^{(0)}$ to $G_{7,64}^{(120)}$ are formed by decorating boundary cycles of $G_{7,64}$ with all

permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,65}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 5]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([5, 1, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^{0}d^{1} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0} \to {}^{1}d^{2} \to {}^{3}d^{0})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{2}d^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	5	3	2	1	6	0	4	α	γ	β	ϵ	δ

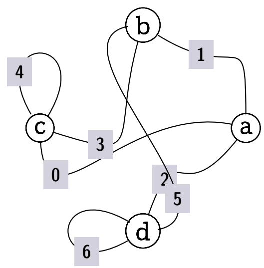
Markings

	$G^{(0)}_{7,65}$	$G^{(1)}_{7,65}$	$G^{(2)}_{7,65}$	$G^{(3)}_{7,65}$	$G^{(4)}_{7,65}$	$G^{(5)}_{7,65}$	$G^{(6)}_{7,65}$	$G^{(7)}_{7,65}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1

(continued.)

	$G_{7,65}^{(8)}$	$G_{7,65}^{(9)}$	$G_{7,65}^{(10)}$	$G_{7,65}^{(11)}$	$G_{7,65}^{(12)}$	$G_{7,65}^{(13)}$	$G_{7,65}^{(14)}$	$G_{7,65}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{7,65}^{(16)}$	$G_{7,65}^{(17)}$	$G_{7,65}^{(18)}$	$G_{7,65}^{(19)}$	$G_{7,65}^{(20)}$	$G_{7,65}^{(21)}$	$G_{7,65}^{(22)}$	$G_{7,65}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{7,65}^{(24)}$	$G_{7,65}^{(25)}$	$G_{7,65}^{(26)}$	$G_{7,65}^{(27)}$	$G_{7,65}^{(28)}$	$G_{7,65}^{(29)}$	$G_{7,65}^{(30)}$	$G_{7,65}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0
	$G_{7,65}^{(32)}$	$G_{7,65}^{(33)}$	$G_{7,65}^{(34)}$	$G_{7,65}^{(35)}$	$G_{7,65}^{(36)}$	$G_{7,65}^{(37)}$	$G_{7,65}^{(38)}$	$G_{7,65}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{7,65}^{(40)}$	$G_{7,65}^{(41)}$	$G_{7,65}^{(42)}$	$G_{7,65}^{(43)}$	$G_{7,65}^{(44)}$	$G_{7,65}^{(45)}$	$G_{7,65}^{(46)}$	$G_{7,65}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{7,65}^{(48)}$	$G_{7,65}^{(49)}$	$G_{7,65}^{(50)}$	$G_{7,65}^{(51)}$	$G_{7,65}^{(52)}$	$G_{7,65}^{(53)}$	$G_{7,65}^{(54)}$	$G_{7,65}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{7,65}^{(56)}$	$G_{7,65}^{(57)}$	$G_{7,65}^{(58)}$	$G_{7,65}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,66}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([5, 3, 1]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([5, 2, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{3}d^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{2}d^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	5	1	3	2	6	0	4	γ	β	α	ϵ	δ

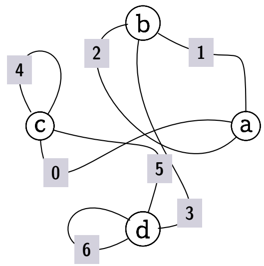
Markings

	$G^{(0)}_{7,66}$	$G^{(1)}_{7,66}$	$G^{(2)}_{7,66}$	$G^{(3)}_{7,66}$	$G^{(4)}_{7,66}$	$G^{(5)}_{7,66}$	$G^{(6)}_{7,66}$	$G^{(7)}_{7,66}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{7,66}$	$G^{(9)}_{7,66}$	$G^{(10)}_{7,66}$	$G^{(11)}_{7,66}$	$G^{(12)}_{7,66}$	$G^{(13)}_{7,66}$	$G^{(14)}_{7,66}$	$G^{(15)}_{7,66}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{7,66}^{(16)}$	$G_{7,66}^{(17)}$	$G_{7,66}^{(18)}$	$G_{7,66}^{(19)}$	$G_{7,66}^{(20)}$	$G_{7,66}^{(21)}$	$G_{7,66}^{(22)}$	$G_{7,66}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{7,66}^{(24)}$	$G_{7,66}^{(25)}$	$G_{7,66}^{(26)}$	$G_{7,66}^{(27)}$	$G_{7,66}^{(28)}$	$G_{7,66}^{(29)}$	$G_{7,66}^{(30)}$	$G_{7,66}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G_{7,66}^{(32)}$	$G_{7,66}^{(33)}$	$G_{7,66}^{(34)}$	$G_{7,66}^{(35)}$	$G_{7,66}^{(36)}$	$G_{7,66}^{(37)}$	$G_{7,66}^{(38)}$	$G_{7,66}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{7,66}^{(40)}$	$G_{7,66}^{(41)}$	$G_{7,66}^{(42)}$	$G_{7,66}^{(43)}$	$G_{7,66}^{(44)}$	$G_{7,66}^{(45)}$	$G_{7,66}^{(46)}$	$G_{7,66}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{7,66}^{(48)}$	$G_{7,66}^{(49)}$	$G_{7,66}^{(50)}$	$G_{7,66}^{(51)}$	$G_{7,66}^{(52)}$	$G_{7,66}^{(53)}$	$G_{7,66}^{(54)}$	$G_{7,66}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G_{7,66}^{(56)}$	$G_{7,66}^{(57)}$	$G_{7,66}^{(58)}$	$G_{7,66}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,67}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 5, 4, 4]),# c
  Vertex([3, 5, 6, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^{3}d^{0} \to {}^{0}a^{1} \to {}^{1}d^{2} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}d^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{2}d^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	3	2	1	0	6	5	4	β	α	γ	ϵ	δ

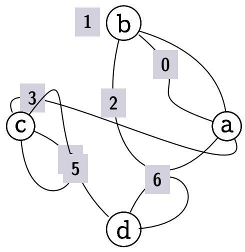
Markings

	$G^{(0)}_{7,67}$	$G^{(1)}_{7,67}$	$G^{(2)}_{7,67}$	$G^{(3)}_{7,67}$	$G^{(4)}_{7,67}$	$G^{(5)}_{7,67}$	$G^{(6)}_{7,67}$	$G^{(7)}_{7,67}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{7,67}$	$G^{(9)}_{7,67}$	$G^{(10)}_{7,67}$	$G^{(11)}_{7,67}$	$G^{(12)}_{7,67}$	$G^{(13)}_{7,67}$	$G^{(14)}_{7,67}$	$G^{(15)}_{7,67}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{7,67}^{(16)}$	$G_{7,67}^{(17)}$	$G_{7,67}^{(18)}$	$G_{7,67}^{(19)}$	$G_{7,67}^{(20)}$	$G_{7,67}^{(21)}$	$G_{7,67}^{(22)}$	$G_{7,67}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{7,67}^{(24)}$	$G_{7,67}^{(25)}$	$G_{7,67}^{(26)}$	$G_{7,67}^{(27)}$	$G_{7,67}^{(28)}$	$G_{7,67}^{(29)}$	$G_{7,67}^{(30)}$	$G_{7,67}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{7,67}^{(32)}$	$G_{7,67}^{(33)}$	$G_{7,67}^{(34)}$	$G_{7,67}^{(35)}$	$G_{7,67}^{(36)}$	$G_{7,67}^{(37)}$	$G_{7,67}^{(38)}$	$G_{7,67}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{7,67}^{(40)}$	$G_{7,67}^{(41)}$	$G_{7,67}^{(42)}$	$G_{7,67}^{(43)}$	$G_{7,67}^{(44)}$	$G_{7,67}^{(45)}$	$G_{7,67}^{(46)}$	$G_{7,67}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{7,67}^{(48)}$	$G_{7,67}^{(49)}$	$G_{7,67}^{(50)}$	$G_{7,67}^{(51)}$	$G_{7,67}^{(52)}$	$G_{7,67}^{(53)}$	$G_{7,67}^{(54)}$	$G_{7,67}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{7,67}^{(56)}$	$G_{7,67}^{(57)}$	$G_{7,67}^{(58)}$	$G_{7,67}^{(59)}$				
α	3	3	3	3				
β	4	4	4	4				
γ	1	1	2	2				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{7,68}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([4, 4, 5, 3]),# c
  Vertex([6, 6, 5]),   # d
])
```

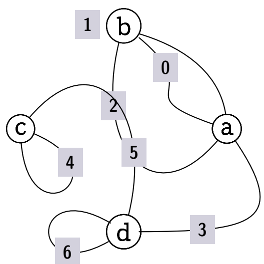
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}d^{0} \to {}^{3}c^{0} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{2}c^{3} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,68}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,68}$ to $G^{(120)}_{7,68}$ are formed by decorating boundary cycles of $G_{7,68}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,69}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([4, 4, 5]),   # c
  Vertex([3, 5, 6, 6]),# d
])
```

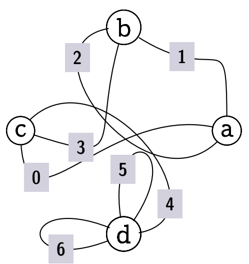
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{3}d^{0} \to {}^{0}d^{1} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,69}$ only has the identity automorphism, so the marked fatgraphs $G_{7,69}^{(0)}$ to $G_{7,69}^{(120)}$ are formed by decorating boundary cycles of $G_{7,69}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,70}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([2, 3, 1]),      # b
  Vertex([0, 3, 4]),      # c
  Vertex([4, 5, 5, 6, 6]),# d
])
```

Boundary cycles

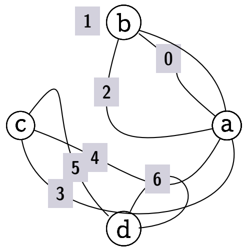
$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{4}d^{0} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}d^{3} \to {}^{0}d^{1} \to {}^{2}c^{0})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{1}d^{2})$$
$$\epsilon = ({}^{3}d^{4})$$

Markings

Fatgraph $G_{7,70}$ only has the identity automorphism, so the marked fatgraphs $G_{7,70}^{(0)}$ to $G_{7,70}^{(120)}$ are formed by decorating boundary cycles of $G_{7,70}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,71}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 4, 3]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([3, 4, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

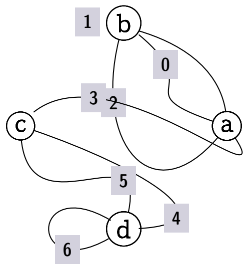
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{4}a^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\delta = ({}^{3}a^{4} \to {}^{0}c^{1})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,71}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,71}$ to $G^{(120)}_{7,71}$ are formed by decorating boundary cycles of $G_{7,71}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,72}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 4, 3]),   # c
  Vertex([4, 5, 6, 6]),# d
])
```

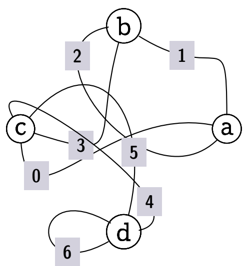
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{3}d^{0} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}d^{1} \to {}^{0}c^{1})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,72}$ only has the identity automorphism, so the marked fatgraphs $G_{7,72}^{(0)}$ to $G_{7,72}^{(120)}$ are formed by decorating boundary cycles of $G_{7,72}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,73}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 5, 4]),# c
  Vertex([4, 5, 6, 6]),# d
])
```

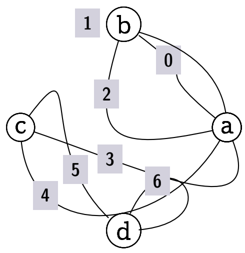
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{3}d^{0} \to {}^{1}d^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0}) \\
\delta &= ({}^{0}d^{1} \to {}^{2}c^{3}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

Fatgraph $G_{7,73}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,73}$ to $G^{(120)}_{7,73}$ are formed by decorating boundary cycles of $G_{7,73}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,74}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 4, 3]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([4, 3, 5]),      # c
  Vertex([6, 6, 5]),      # d
])
```

Boundary cycles

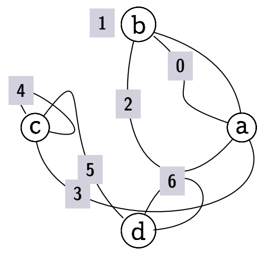
$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{0}c^{1} \to {}^{4}a^{0}) \\
\delta &= ({}^{2}d^{0} \to {}^{3}a^{4} \to {}^{1}d^{2} \to {}^{1}c^{2} \to {}^{2}c^{0}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,74}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,74}$ to $G^{(120)}_{7,74}$ are formed by decorating boundary cycles of $G_{7,74}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,75}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([3, 4, 5, 4]),# c
  Vertex([6, 6, 5]),   # d
])
```

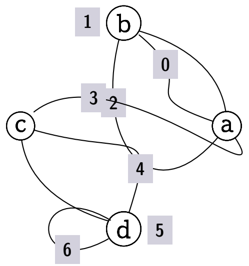
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{3}a^{0} \to {}^{3}c^{0} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}d^{0} \to {}^{2}c^{3} \to {}^{1}d^{2} \to {}^{1}c^{2})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,75}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,75}$ to $G^{(120)}_{7,75}$ are formed by decorating boundary cycles of $G_{7,75}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,76}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 4, 3]),   # c
  Vertex([5, 4, 6, 6]),# d
])
```

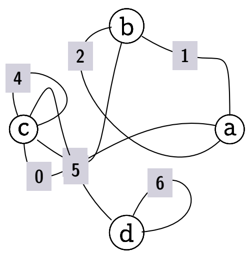
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{2}c^{0}) \\
\delta &= ({}^{3}d^{0} \to {}^{1}d^{2} \to {}^{0}c^{1}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

Fatgraph $G_{7,76}$ only has the identity automorphism, so the marked fatgraphs $G_{7,76}^{(0)}$ to $G_{7,76}^{(120)}$ are formed by decorating boundary cycles of $G_{7,76}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,77}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([2, 3, 1]),      # b
  Vertex([0, 3, 4, 5, 4]),# c
  Vertex([6, 6, 5]),      # d
])
```

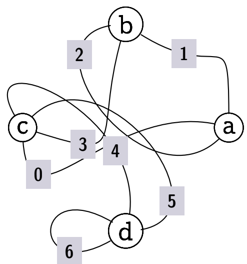
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^4c^0 \to {}^1c^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^2d^0 \to {}^3c^4 \to {}^2c^3 \to {}^1d^2)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,77}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,77}$ to $G^{(120)}_{7,77}$ are formed by decorating boundary cycles of $G_{7,77}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,78}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 5, 4]),# c
  Vertex([5, 4, 6, 6]),# d
])
```

Boundary cycles

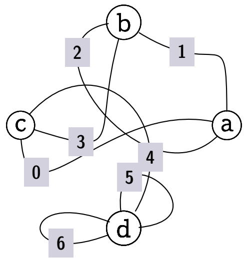
$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^0d^1 \to {}^3c^0 \to {}^1c^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^3d^0 \to {}^2c^3 \to {}^1d^2)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,78}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,78}$ to $G^{(120)}_{7,78}$ are formed by decorating boundary cycles of $G_{7,78}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,79}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),      # a
  Vertex([2, 3, 1]),      # b
  Vertex([0, 3, 4]),      # c
  Vertex([5, 4, 5, 6, 6]),# d
])
```

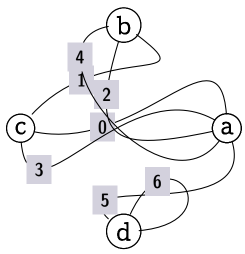
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{2}d^{3} \to {}^{4}d^{0})$$
$$\epsilon = ({}^{3}d^{4})$$

Markings

Fatgraph $G_{7,79}$ only has the identity automorphism, so the marked fatgraphs $G_{7,79}^{(0)}$ to $G_{7,79}^{(120)}$ are formed by decorating boundary cycles of $G_{7,79}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,80}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 3, 2, 4, 5]),# a
  Vertex([4, 2, 1]),      # b
  Vertex([3, 0, 1]),      # c
  Vertex([6, 6, 5]),      # d
])
```

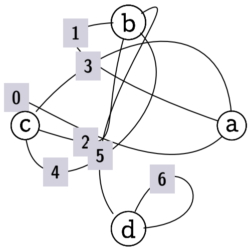
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}d^{0} \to {}^{3}a^{4} \to {}^{4}a^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{1}d^{2})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,80}$ only has the identity automorphism, so the marked fatgraphs $G_{7,80}^{(0)}$ to $G_{7,80}^{(120)}$ are formed by decorating boundary cycles of $G_{7,80}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,81}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0]),   # a
  Vertex([1, 2, 4, 5]),# b
  Vertex([4, 2, 3, 0]),# c
  Vertex([6, 6, 5]),   # d
])
```

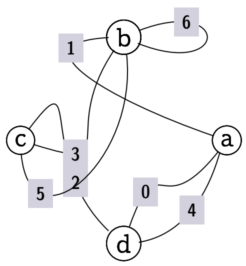
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}b^{3} \to {}^{3}b^{0} \to {}^{3}c^{0} \to {}^{1}d^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}c^{3}) \\
\delta &= ({}^{0}c^{1} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{7,81}$ only has the identity automorphism, so the marked fatgraphs $G_{7,81}^{(0)}$ to $G_{7,81}^{(120)}$ are formed by decorating boundary cycles of $G_{7,81}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,82}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([1, 3, 5, 6, 6]),# b
  Vertex([5, 3, 2]),      # c
  Vertex([4, 0, 2]),      # d
])
```

Boundary cycles

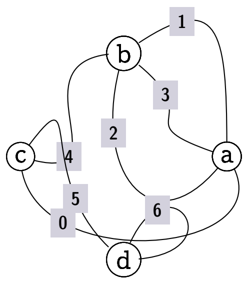
$$
\begin{aligned}
\alpha &= ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}b^{3} \to {}^{4}b^{0} \to {}^{1}d^{2} \to {}^{2}c^{0}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}d^{1}) \\
\delta &= ({}^{0}c^{1} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{3}b^{4})
\end{aligned}
$$

Markings

Fatgraph $G_{7,82}$ only has the identity automorphism, so the marked fatgraphs $G_{7,82}^{(0)}$ to $G_{7,82}^{(120)}$ are formed by decorating boundary cycles of $G_{7,82}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,83}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 3, 2, 0]),# a
  Vertex([4, 2, 3, 1]),# b
  Vertex([0, 4, 5]),   # c
  Vertex([6, 6, 5]),   # d
])
```

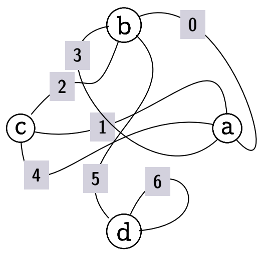
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{2}b^{3})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}d^{0} \to {}^{3}a^{0} \to {}^{2}c^{0} \to {}^{3}b^{0} \to {}^{1}c^{2} \to {}^{1}d^{2})$$
$$\epsilon = ({}^{0}d^{1})$$

Markings

Fatgraph $G_{7,83}$ only has the identity automorphism, so the marked fatgraphs $G_{7,83}^{(0)}$ to $G_{7,83}^{(120)}$ are formed by decorating boundary cycles of $G_{7,83}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,84}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 3, 0]),# a
  Vertex([3, 2, 5, 0]),# b
  Vertex([4, 1, 2]),   # c
  Vertex([6, 6, 5]),   # d
])
```

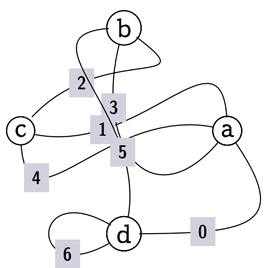
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{0}b^{1}) \\
\gamma &= ({}^{2}a^{3} \to {}^{3}b^{0}) \\
\delta &= ({}^{2}d^{0} \to {}^{3}a^{0} \to {}^{2}b^{3} \to {}^{1}c^{2} \to {}^{1}b^{2} \to {}^{1}d^{2}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}$$

Markings

Fatgraph $G_{7,84}$ only has the identity automorphism, so the marked fatgraphs $G_{7,84}^{(0)}$ to $G_{7,84}^{(120)}$ are formed by decorating boundary cycles of $G_{7,84}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,85}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 3, 0]),# a
  Vertex([5, 3, 2]),   # b
  Vertex([4, 1, 2]),   # c
  Vertex([0, 5, 6, 6]),# d
])
```

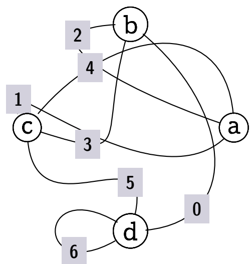
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1)$$
$$\beta = ({}^1a^2 \to {}^2c^0 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^0d^1 \to {}^0b^1)$$
$$\delta = ({}^3a^0 \to {}^3d^0 \to {}^2b^0 \to {}^1d^2 \to {}^1c^2)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,85}$ only has the identity automorphism, so the marked fatgraphs $G_{7,85}^{(0)}$ to $G_{7,85}^{(120)}$ are formed by decorating boundary cycles of $G_{7,85}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,86}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([5, 3, 4, 1]),# c
  Vertex([0, 5, 6, 6]),# d
])
```

Boundary cycles

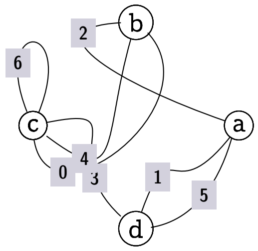
$$\alpha = ({}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^3d^0 \to {}^2b^0 \to {}^1d^2 \to {}^3c^0)$$
$$\gamma = ({}^2a^0 \to {}^2c^3)$$
$$\delta = ({}^0d^1 \to {}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^2d^3)$$

Markings

Fatgraph $G_{7,86}$ only has the identity automorphism, so the marked fatgraphs $G_{7,86}^{(0)}$ to $G_{7,86}^{(120)}$ are formed by decorating boundary cycles of $G_{7,86}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,87}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),      # a
  Vertex([2, 4, 0]),      # b
  Vertex([0, 4, 3, 6, 6]),# c
  Vertex([5, 1, 3]),      # d
])
```

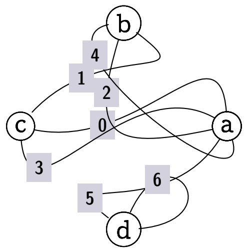
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{4}c^{0} \to {}^{2}c^{3} \to {}^{2}b^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{0}c^{1} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{3}c^{4})$$

Markings

Fatgraph $G_{7,87}$ only has the identity automorphism, so the marked fatgraphs $G_{7,87}^{(0)}$ to $G_{7,87}^{(120)}$ are formed by decorating boundary cycles of $G_{7,87}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,88}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 3, 2, 5, 4]),# a
  Vertex([4, 2, 1]),      # b
  Vertex([3, 0, 1]),      # c
  Vertex([6, 6, 5]),      # d
])
```

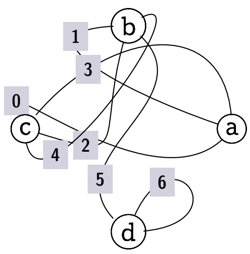
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1)$$
$$\beta = ({}^1a^2 \to {}^2c^0 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^2d^0 \to {}^3a^4 \to {}^1d^2 \to {}^0b^1)$$
$$\delta = ({}^2b^0 \to {}^1c^2 \to {}^4a^0)$$
$$\epsilon = ({}^0d^1)$$

Markings

Fatgraph $G_{7,88}$ only has the identity automorphism, so the marked fatgraphs $G_{7,88}^{(0)}$ to $G_{7,88}^{(120)}$ are formed by decorating boundary cycles of $G_{7,88}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,89}$ (120 orientable markings)




```
Fatgraph([
  Vertex([3, 1, 0]),   # a
  Vertex([1, 2, 5, 4]),# b
  Vertex([4, 2, 3, 0]),# c
  Vertex([6, 6, 5]),   # d
])
```

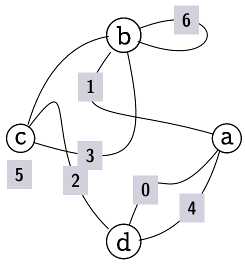
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}b^{0} \to {}^{3}c^{0}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}c^{3}) \\
\delta &= ({}^{2}d^{0} \to {}^{2}b^{3} \to {}^{1}d^{2} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{0}d^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{7,89}$ only has the identity automorphism, so the marked fatgraphs $G_{7,89}^{(0)}$ to $G_{7,89}^{(120)}$ are formed by decorating boundary cycles of $G_{7,89}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,90}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),      # a
  Vertex([5, 1, 3, 6, 6]),# b
  Vertex([5, 3, 2]),      # c
  Vertex([4, 0, 2]),      # d
])
```

Boundary cycles

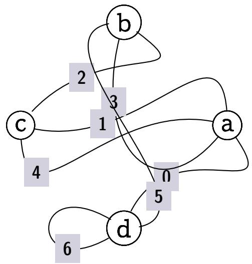
$$
\begin{aligned}
\alpha &= ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}b^{1} \to {}^{1}d^{2} \to {}^{2}c^{0}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}d^{1}) \\
\delta &= ({}^{4}b^{0} \to {}^{0}c^{1} \to {}^{2}b^{3}) \\
\epsilon &= ({}^{3}b^{4})
\end{aligned}
$$

Markings

Fatgraph $G_{7,90}$ only has the identity automorphism, so the marked fatgraphs $G_{7,90}^{(0)}$ to $G_{7,90}^{(120)}$ are formed by decorating boundary cycles of $G_{7,90}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,91}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 3, 0]),# a
  Vertex([5, 3, 2]),   # b
  Vertex([4, 1, 2]),   # c
  Vertex([5, 0, 6, 6]),# d
])
```

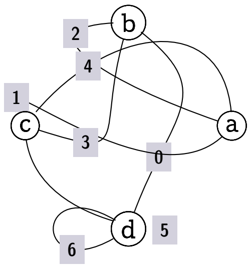
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{3}d^{0} \to {}^{1}d^{2} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}a^{0} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}c^{2})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,91}$ only has the identity automorphism, so the marked fatgraphs $G_{7,91}^{(0)}$ to $G_{7,91}^{(120)}$ are formed by decorating boundary cycles of $G_{7,91}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,92}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([5, 3, 4, 1]),# c
  Vertex([5, 0, 6, 6]),# d
])
```

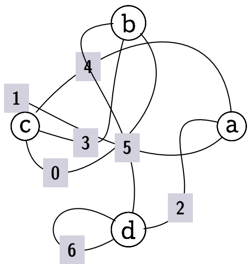
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{3}c^{0})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}c^{3})$$
$$\delta = ({}^{3}d^{0} \to {}^{1}d^{2} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{2}d^{3})$$

Markings

Fatgraph $G_{7,92}$ only has the identity automorphism, so the marked fatgraphs $G_{7,92}^{(0)}$ to $G_{7,92}^{(120)}$ are formed by decorating boundary cycles of $G_{7,92}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,93}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 2, 1]),   # a
  Vertex([5, 3, 0]),   # b
  Vertex([0, 3, 4, 1]),# c
  Vertex([2, 5, 6, 6]),# d
])
```

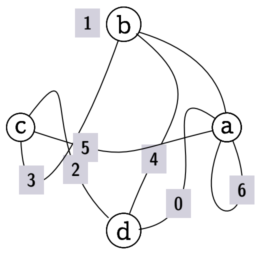
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}d^{1} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{3}d^{0} \to {}^{2}b^{0} \to {}^{1}d^{2} \to {}^{3}c^{0}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}c^{3}) \\
\delta &= ({}^{0}c^{1} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{2}d^{3})
\end{aligned}$$

Markings

Fatgraph $G_{7,93}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,93}$ to $G^{(120)}_{7,93}$ are formed by decorating boundary cycles of $G_{7,93}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,94}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 6, 6]),# a
  Vertex([1, 3, 4]),      # b
  Vertex([3, 5, 2]),      # c
  Vertex([0, 4, 2]),      # d
])
```

Boundary cycles

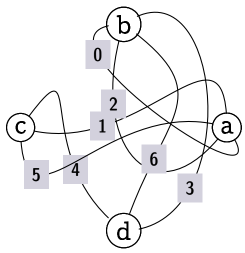
$$\begin{aligned}
\alpha &= ({}^{0}d^{1} \to {}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}d^{0} \to {}^{1}c^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{0}c^{1} \to {}^{4}a^{0}) \\
\delta &= ({}^{3}a^{4}) \\
\epsilon &= ({}^{2}c^{0} \to {}^{1}d^{2} \to {}^{1}b^{2})
\end{aligned}$$

Markings

Fatgraph $G_{7,94}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,94}$ to $G^{(120)}_{7,94}$ are formed by decorating boundary cycles of $G_{7,94}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,95}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 5, 2, 0]),# a
  Vertex([0, 2, 6, 3]),# b
  Vertex([5, 1, 4]),   # c
  Vertex([3, 6, 4]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}d^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}a^{0} \to {}^{2}d^{0} \to {}^{3}b^{0} \to {}^{1}c^{2})$$
$$\epsilon = ({}^{0}d^{1} \to {}^{2}b^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	2	6	0	5	4	3	1	ϵ	δ	γ	β	α

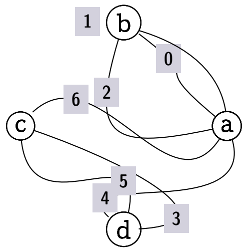
Markings

	$G^{(0)}_{7,95}$	$G^{(1)}_{7,95}$	$G^{(2)}_{7,95}$	$G^{(3)}_{7,95}$	$G^{(4)}_{7,95}$	$G^{(5)}_{7,95}$	$G^{(6)}_{7,95}$	$G^{(7)}_{7,95}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

(continued.)

	$G_{7,95}^{(8)}$	$G_{7,95}^{(9)}$	$G_{7,95}^{(10)}$	$G_{7,95}^{(11)}$	$G_{7,95}^{(12)}$	$G_{7,95}^{(13)}$	$G_{7,95}^{(14)}$	$G_{7,95}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{7,95}^{(16)}$	$G_{7,95}^{(17)}$	$G_{7,95}^{(18)}$	$G_{7,95}^{(19)}$	$G_{7,95}^{(20)}$	$G_{7,95}^{(21)}$	$G_{7,95}^{(22)}$	$G_{7,95}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{7,95}^{(24)}$	$G_{7,95}^{(25)}$	$G_{7,95}^{(26)}$	$G_{7,95}^{(27)}$	$G_{7,95}^{(28)}$	$G_{7,95}^{(29)}$	$G_{7,95}^{(30)}$	$G_{7,95}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{7,95}^{(32)}$	$G_{7,95}^{(33)}$	$G_{7,95}^{(34)}$	$G_{7,95}^{(35)}$	$G_{7,95}^{(36)}$	$G_{7,95}^{(37)}$	$G_{7,95}^{(38)}$	$G_{7,95}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	0	0	2	4	0	0	2	3
ϵ	4	3	4	2	4	2	3	2
	$G_{7,95}^{(40)}$	$G_{7,95}^{(41)}$	$G_{7,95}^{(42)}$	$G_{7,95}^{(43)}$	$G_{7,95}^{(44)}$	$G_{7,95}^{(45)}$	$G_{7,95}^{(46)}$	$G_{7,95}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	0	0	3	4	1	1	3	4
ϵ	3	2	4	3	4	3	4	3
	$G_{7,95}^{(48)}$	$G_{7,95}^{(49)}$	$G_{7,95}^{(50)}$	$G_{7,95}^{(51)}$	$G_{7,95}^{(52)}$	$G_{7,95}^{(53)}$	$G_{7,95}^{(54)}$	$G_{7,95}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	0	0	1	0	1	0	2	1
ϵ	4	3	4	4	3	3	4	4
	$G_{7,95}^{(56)}$	$G_{7,95}^{(57)}$	$G_{7,95}^{(58)}$	$G_{7,95}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	0	2	0	1				
δ	2	0	1	0				
ϵ	4	4	4	4				

The Fatgraph $G_{7,96}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 6, 4]),# a
  Vertex([1, 2, 0]),      # b
  Vertex([5, 3, 6]),      # c
  Vertex([3, 5, 4]),      # d
])
```

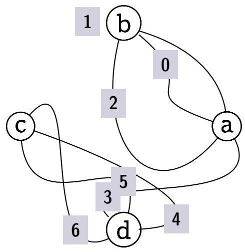
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{4}a^{0} \to {}^{0}b^{1} \to {}^{1}d^{2} \to {}^{2}c^{0})$$
$$\delta = ({}^{2}d^{0} \to {}^{3}a^{4} \to {}^{1}c^{2})$$
$$\epsilon = ({}^{0}d^{1} \to {}^{0}c^{1})$$

Markings

Fatgraph $G_{7,96}$ only has the identity automorphism, so the marked fatgraphs $G_{7,96}^{(0)}$ to $G_{7,96}^{(120)}$ are formed by decorating boundary cycles of $G_{7,96}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,97}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 4, 6]),   # c
  Vertex([4, 5, 3, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1 \to {}^3a^0 \to {}^2d^3 \to {}^2c^0 \to {}^1d^2)$$
$$\delta = ({}^0d^1 \to {}^0c^1)$$
$$\epsilon = ({}^3d^0 \to {}^1c^2)$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	d	c	b	a	4	6	5	3	0	2	1	ϵ	δ	γ	β	α

Markings

	$G^{(0)}_{7,97}$	$G^{(1)}_{7,97}$	$G^{(2)}_{7,97}$	$G^{(3)}_{7,97}$	$G^{(4)}_{7,97}$	$G^{(5)}_{7,97}$	$G^{(6)}_{7,97}$	$G^{(7)}_{7,97}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{7,97}$	$G^{(9)}_{7,97}$	$G^{(10)}_{7,97}$	$G^{(11)}_{7,97}$	$G^{(12)}_{7,97}$	$G^{(13)}_{7,97}$	$G^{(14)}_{7,97}$	$G^{(15)}_{7,97}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}_{7,97}$	$G^{(17)}_{7,97}$	$G^{(18)}_{7,97}$	$G^{(19)}_{7,97}$	$G^{(20)}_{7,97}$	$G^{(21)}_{7,97}$	$G^{(22)}_{7,97}$	$G^{(23)}_{7,97}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{7,97}$	$G^{(25)}_{7,97}$	$G^{(26)}_{7,97}$	$G^{(27)}_{7,97}$	$G^{(28)}_{7,97}$	$G^{(29)}_{7,97}$	$G^{(30)}_{7,97}$	$G^{(31)}_{7,97}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

(continued.)

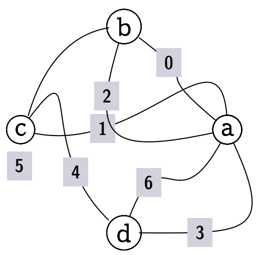
	$G_{7,97}^{(32)}$	$G_{7,97}^{(33)}$	$G_{7,97}^{(34)}$	$G_{7,97}^{(35)}$	$G_{7,97}^{(36)}$	$G_{7,97}^{(37)}$	$G_{7,97}^{(38)}$	$G_{7,97}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	0	0	2	4	0	0	2	3
ϵ	4	3	4	2	4	2	3	2

	$G_{7,97}^{(40)}$	$G_{7,97}^{(41)}$	$G_{7,97}^{(42)}$	$G_{7,97}^{(43)}$	$G_{7,97}^{(44)}$	$G_{7,97}^{(45)}$	$G_{7,97}^{(46)}$	$G_{7,97}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	0	0	3	4	1	1	3	4
ϵ	3	2	4	3	4	3	4	3

	$G_{7,97}^{(48)}$	$G_{7,97}^{(49)}$	$G_{7,97}^{(50)}$	$G_{7,97}^{(51)}$	$G_{7,97}^{(52)}$	$G_{7,97}^{(53)}$	$G_{7,97}^{(54)}$	$G_{7,97}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	0	0	1	0	1	0	2	1
ϵ	4	3	4	4	3	3	4	4

	$G_{7,97}^{(56)}$	$G_{7,97}^{(57)}$	$G_{7,97}^{(58)}$	$G_{7,97}^{(59)}$
α	3	3	3	3
β	1	1	2	2
γ	0	2	0	1
δ	2	0	1	0
ϵ	4	4	4	4

The Fatgraph $G_{7,98}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 6, 3]),# a
  Vertex([5, 2, 0]),      # b
  Vertex([5, 1, 4]),      # c
  Vertex([3, 6, 4]),      # d
])
```

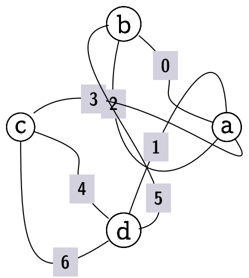
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1} \to {}^{0}c^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{1}d^{2} \to {}^{2}c^{0}) \\
\delta &= ({}^{0}d^{1} \to {}^{3}a^{4}) \\
\epsilon &= ({}^{2}d^{0} \to {}^{1}c^{2} \to {}^{4}a^{0})
\end{aligned}$$

Markings

Fatgraph $G_{7,98}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{7,98}$ to $G^{(120)}_{7,98}$ are formed by decorating boundary cycles of $G_{7,98}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{7,99}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([5, 2, 0]),   # b
  Vertex([6, 4, 3]),   # c
  Vertex([5, 1, 4, 6]),# d
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}d^{1} \to {}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{3}d^{0} \to {}^{0}b^{1} \to {}^{2}c^{0}) \\
\delta &= ({}^{3}a^{0} \to {}^{1}d^{2} \to {}^{1}c^{2}) \\
\epsilon &= ({}^{2}d^{3} \to {}^{0}c^{1})
\end{aligned}$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	d	c	b	a	4	1	6	5	0	3	2	δ	ϵ	γ	α	β

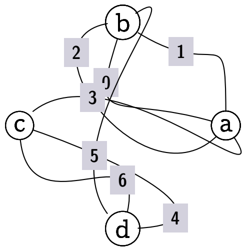
Markings

	$G^{(0)}_{7,99}$	$G^{(1)}_{7,99}$	$G^{(2)}_{7,99}$	$G^{(3)}_{7,99}$	$G^{(4)}_{7,99}$	$G^{(5)}_{7,99}$	$G^{(6)}_{7,99}$	$G^{(7)}_{7,99}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{7,99}$	$G^{(9)}_{7,99}$	$G^{(10)}_{7,99}$	$G^{(11)}_{7,99}$	$G^{(12)}_{7,99}$	$G^{(13)}_{7,99}$	$G^{(14)}_{7,99}$	$G^{(15)}_{7,99}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}_{7,99}$	$G^{(17)}_{7,99}$	$G^{(18)}_{7,99}$	$G^{(19)}_{7,99}$	$G^{(20)}_{7,99}$	$G^{(21)}_{7,99}$	$G^{(22)}_{7,99}$	$G^{(23)}_{7,99}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{7,99}$	$G^{(25)}_{7,99}$	$G^{(26)}_{7,99}$	$G^{(27)}_{7,99}$	$G^{(28)}_{7,99}$	$G^{(29)}_{7,99}$	$G^{(30)}_{7,99}$	$G^{(31)}_{7,99}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(32)}_{7,99}$	$G^{(33)}_{7,99}$	$G^{(34)}_{7,99}$	$G^{(35)}_{7,99}$	$G^{(36)}_{7,99}$	$G^{(37)}_{7,99}$	$G^{(38)}_{7,99}$	$G^{(39)}_{7,99}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	4	3	2	4	4	2	2	3
ϵ	0	0	4	2	0	0	3	2
	$G^{(40)}_{7,99}$	$G^{(41)}_{7,99}$	$G^{(42)}_{7,99}$	$G^{(43)}_{7,99}$	$G^{(44)}_{7,99}$	$G^{(45)}_{7,99}$	$G^{(46)}_{7,99}$	$G^{(47)}_{7,99}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	3	2	3	4	4	3	3	4
ϵ	0	0	4	3	1	1	4	3
	$G^{(48)}_{7,99}$	$G^{(49)}_{7,99}$	$G^{(50)}_{7,99}$	$G^{(51)}_{7,99}$	$G^{(52)}_{7,99}$	$G^{(53)}_{7,99}$	$G^{(54)}_{7,99}$	$G^{(55)}_{7,99}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2

(continued.)

δ	4	3	4	4	3	3	4	4
ϵ	0	0	1	0	1	0	2	1
	$G_{7,99}^{(56)}$	$G_{7,99}^{(57)}$	$G_{7,99}^{(58)}$	$G_{7,99}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	0	2	0	1				
δ	4	4	4	4				
ϵ	2	0	1	0				

The Fatgraph $G_{7,100}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([2, 0, 1, 5]),# b
  Vertex([6, 4, 3]),   # c
  Vertex([4, 6, 5]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{3} \to {}^{3}b^{0} \to {}^{1}d^{2} \to {}^{2}c^{0})$$
$$\delta = ({}^{3}a^{0} \to {}^{2}d^{0} \to {}^{1}c^{2} \to {}^{2}b^{3})$$
$$\epsilon = ({}^{0}d^{1} \to {}^{0}c^{1})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	0	2	1	5	6	3	4	β	α	δ	γ	ϵ

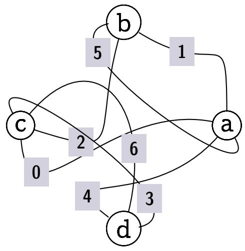
Markings

	$G^{(0)}_{7,100}$	$G^{(1)}_{7,100}$	$G^{(2)}_{7,100}$	$G^{(3)}_{7,100}$	$G^{(4)}_{7,100}$	$G^{(5)}_{7,100}$	$G^{(6)}_{7,100}$	$G^{(7)}_{7,100}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{7,100}$	$G^{(9)}_{7,100}$	$G^{(10)}_{7,100}$	$G^{(11)}_{7,100}$	$G^{(12)}_{7,100}$	$G^{(13)}_{7,100}$	$G^{(14)}_{7,100}$	$G^{(15)}_{7,100}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}_{7,100}$	$G^{(17)}_{7,100}$	$G^{(18)}_{7,100}$	$G^{(19)}_{7,100}$	$G^{(20)}_{7,100}$	$G^{(21)}_{7,100}$	$G^{(22)}_{7,100}$	$G^{(23)}_{7,100}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{7,100}$	$G^{(25)}_{7,100}$	$G^{(26)}_{7,100}$	$G^{(27)}_{7,100}$	$G^{(28)}_{7,100}$	$G^{(29)}_{7,100}$	$G^{(30)}_{7,100}$	$G^{(31)}_{7,100}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G^{(32)}_{7,100}$	$G^{(33)}_{7,100}$	$G^{(34)}_{7,100}$	$G^{(35)}_{7,100}$	$G^{(36)}_{7,100}$	$G^{(37)}_{7,100}$	$G^{(38)}_{7,100}$	$G^{(39)}_{7,100}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G^{(40)}_{7,100}$	$G^{(41)}_{7,100}$	$G^{(42)}_{7,100}$	$G^{(43)}_{7,100}$	$G^{(44)}_{7,100}$	$G^{(45)}_{7,100}$	$G^{(46)}_{7,100}$	$G^{(47)}_{7,100}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G^{(48)}_{7,100}$	$G^{(49)}_{7,100}$	$G^{(50)}_{7,100}$	$G^{(51)}_{7,100}$	$G^{(52)}_{7,100}$	$G^{(53)}_{7,100}$	$G^{(54)}_{7,100}$	$G^{(55)}_{7,100}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1

(continued.)

	$G_{7,100}^{(56)}$	$G_{7,100}^{(57)}$	$G_{7,100}^{(58)}$	$G_{7,100}^{(59)}$
α	3	3	3	3
β	4	4	4	4
γ	1	1	2	2
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{7,101}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 4, 5]),# a
  Vertex([5, 2, 1]),   # b
  Vertex([0, 2, 6, 3]),# c
  Vertex([3, 6, 4]),   # d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}d^{0} \to {}^{3}c^{0})$$
$$\gamma = ({}^{2}a^{3} \to {}^{1}d^{2} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}a^{0} \to {}^{2}b^{0})$$
$$\epsilon = ({}^{0}d^{1} \to {}^{2}c^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	c	d	a	b	0	3	4	1	2	6	5	β	α	γ	ϵ	δ

Markings

	$G^{(0)}_{7,101}$	$G^{(1)}_{7,101}$	$G^{(2)}_{7,101}$	$G^{(3)}_{7,101}$	$G^{(4)}_{7,101}$	$G^{(5)}_{7,101}$	$G^{(6)}_{7,101}$	$G^{(7)}_{7,101}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

	$G^{(8)}_{7,101}$	$G^{(9)}_{7,101}$	$G^{(10)}_{7,101}$	$G^{(11)}_{7,101}$	$G^{(12)}_{7,101}$	$G^{(13)}_{7,101}$	$G^{(14)}_{7,101}$	$G^{(15)}_{7,101}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

	$G^{(16)}_{7,101}$	$G^{(17)}_{7,101}$	$G^{(18)}_{7,101}$	$G^{(19)}_{7,101}$	$G^{(20)}_{7,101}$	$G^{(21)}_{7,101}$	$G^{(22)}_{7,101}$	$G^{(23)}_{7,101}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1

	$G^{(24)}_{7,101}$	$G^{(25)}_{7,101}$	$G^{(26)}_{7,101}$	$G^{(27)}_{7,101}$	$G^{(28)}_{7,101}$	$G^{(29)}_{7,101}$	$G^{(30)}_{7,101}$	$G^{(31)}_{7,101}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2

	$G^{(32)}_{7,101}$	$G^{(33)}_{7,101}$	$G^{(34)}_{7,101}$	$G^{(35)}_{7,101}$	$G^{(36)}_{7,101}$	$G^{(37)}_{7,101}$	$G^{(38)}_{7,101}$	$G^{(39)}_{7,101}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0

	$G^{(40)}_{7,101}$	$G^{(41)}_{7,101}$	$G^{(42)}_{7,101}$	$G^{(43)}_{7,101}$	$G^{(44)}_{7,101}$	$G^{(45)}_{7,101}$	$G^{(46)}_{7,101}$	$G^{(47)}_{7,101}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0

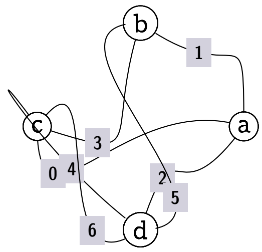
	$G^{(48)}_{7,101}$	$G^{(49)}_{7,101}$	$G^{(50)}_{7,101}$	$G^{(51)}_{7,101}$	$G^{(52)}_{7,101}$	$G^{(53)}_{7,101}$	$G^{(54)}_{7,101}$	$G^{(55)}_{7,101}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1

	$G^{(56)}_{7,101}$	$G^{(57)}_{7,101}$	$G^{(58)}_{7,101}$	$G^{(59)}_{7,101}$
α	3	3	3	3

(continued.)

β	4	4	4	4
γ	1	1	2	2
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{7,102}$ (non-orientable, 60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([5, 3, 1]),   # b
  Vertex([0, 3, 6, 4]),# c
  Vertex([5, 2, 4, 6]),# d
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}d^{2} \to {}^{3}c^{0})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{3}d^{0} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\epsilon = ({}^{2}d^{3} \to {}^{2}c^{3})$$

Automorphisms

A_0	a	b	c	d	0	1	2	3	4	5	6	α	β	γ	δ	ϵ
$A_1{}^{\dagger\ddagger}$	b	a	d	c	5	1	3	2	6	0	4	γ	δ	α	β	ϵ

Markings

	$G^{(0)}_{7,102}$	$G^{(1)}_{7,102}$	$G^{(2)}_{7,102}$	$G^{(3)}_{7,102}$	$G^{(4)}_{7,102}$	$G^{(5)}_{7,102}$	$G^{(6)}_{7,102}$	$G^{(7)}_{7,102}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

	$G^{(8)}_{7,102}$	$G^{(9)}_{7,102}$	$G^{(10)}_{7,102}$	$G^{(11)}_{7,102}$	$G^{(12)}_{7,102}$	$G^{(13)}_{7,102}$	$G^{(14)}_{7,102}$	$G^{(15)}_{7,102}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

	$G^{(16)}_{7,102}$	$G^{(17)}_{7,102}$	$G^{(18)}_{7,102}$	$G^{(19)}_{7,102}$	$G^{(20)}_{7,102}$	$G^{(21)}_{7,102}$	$G^{(22)}_{7,102}$	$G^{(23)}_{7,102}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1

	$G^{(24)}_{7,102}$	$G^{(25)}_{7,102}$	$G^{(26)}_{7,102}$	$G^{(27)}_{7,102}$	$G^{(28)}_{7,102}$	$G^{(29)}_{7,102}$	$G^{(30)}_{7,102}$	$G^{(31)}_{7,102}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0

	$G^{(32)}_{7,102}$	$G^{(33)}_{7,102}$	$G^{(34)}_{7,102}$	$G^{(35)}_{7,102}$	$G^{(36)}_{7,102}$	$G^{(37)}_{7,102}$	$G^{(38)}_{7,102}$	$G^{(39)}_{7,102}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0

	$G^{(40)}_{7,102}$	$G^{(41)}_{7,102}$	$G^{(42)}_{7,102}$	$G^{(43)}_{7,102}$	$G^{(44)}_{7,102}$	$G^{(45)}_{7,102}$	$G^{(46)}_{7,102}$	$G^{(47)}_{7,102}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0

	$G^{(48)}_{7,102}$	$G^{(49)}_{7,102}$	$G^{(50)}_{7,102}$	$G^{(51)}_{7,102}$	$G^{(52)}_{7,102}$	$G^{(53)}_{7,102}$	$G^{(54)}_{7,102}$	$G^{(55)}_{7,102}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1

	$G^{(56)}_{7,102}$	$G^{(57)}_{7,102}$	$G^{(58)}_{7,102}$	$G^{(59)}_{7,102}$
α	3	3	3	3

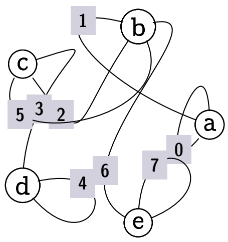
(continued.)

β	1	1	2	2
γ	4	4	4	4
δ	0	2	0	1
ϵ	2	0	1	0

Fatgraphs with 8 edges / 5 vertices

There are 72 unmarked fatgraphs in this section, originating 16320 marked fatgraphs (8160 orientable, and 8160 nonorientable).

The Fatgraph $G_{8,0}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),   # a
  Vertex([1, 2, 5, 6]),# b
  Vertex([5, 2, 3]),   # c
  Vertex([4, 4, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^2b^3 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^3b^0 \to {}^2e^0 \to {}^1c^2 \to {}^0b^1 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

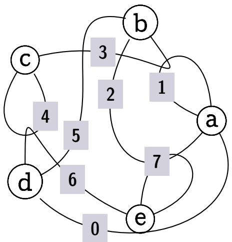
Fatgraph $G_{8,0}$ only has the identity automorphism, so the marked fatgraphs $G_{8,0}^{(0)}$ to $G_{8,0}^{(120)}$ are formed by decorating boundary cycles of $G_{8,0}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section “Markings of fatgraphs with trivial automorphisms” for a complete table.

Differentials

$$D(G_{8,0}^{(0)}) = +G_{7,0}^{(25)} - G_{7,0}^{(48)}$$
$$D(G_{8,0}^{(1)}) = +G_{7,0}^{(24)} - G_{7,0}^{(49)}$$
$$D(G_{8,0}^{(2)}) = +G_{7,0}^{(27)} - G_{7,0}^{(72)}$$
$$D(G_{8,0}^{(3)}) = +G_{7,0}^{(26)} - G_{7,0}^{(73)}$$
$$D(G_{8,0}^{(4)}) = +G_{7,0}^{(29)} - G_{7,0}^{(96)}$$
$$D(G_{8,0}^{(5)}) = +G_{7,0}^{(28)} - G_{7,0}^{(97)}$$
$$D(G_{8,0}^{(6)}) = +G_{7,0}^{(51)} - G_{7,0}^{(74)}$$
$$D(G_{8,0}^{(7)}) = +G_{7,0}^{(50)} - G_{7,0}^{(75)}$$
$$D(G_{8,0}^{(8)}) = +G_{7,0}^{(53)} - G_{7,0}^{(98)}$$
$$D(G_{8,0}^{(9)}) = +G_{7,0}^{(52)} - G_{7,0}^{(99)}$$
$$D(G_{8,0}^{(10)}) = +G_{7,0}^{(77)} - G_{7,0}^{(100)}$$
$$D(G_{8,0}^{(11)}) = +G_{7,0}^{(76)} - G_{7,0}^{(101)}$$
$$D(G_{8,0}^{(12)}) = +G_{7,0}^{(1)} - G_{7,0}^{(54)}$$
$$D(G_{8,0}^{(13)}) = +G_{7,0}^{(0)} - G_{7,0}^{(55)}$$
$$D(G_{8,0}^{(14)}) = +G_{7,0}^{(3)} - G_{7,0}^{(78)}$$
$$D(G_{8,0}^{(15)}) = +G_{7,0}^{(2)} - G_{7,0}^{(79)}$$
$$D(G_{8,0}^{(16)}) = +G_{7,0}^{(5)} - G_{7,0}^{(102)}$$
$$D(G_{8,0}^{(17)}) = +G_{7,0}^{(4)}$$
$$D(G_{8,0}^{(18)}) = +G_{7,0}^{(57)} - G_{7,0}^{(80)}$$
$$D(G_{8,0}^{(19)}) = +G_{7,0}^{(56)} - G_{7,0}^{(81)}$$
$$D(G_{8,0}^{(20)}) = +G_{7,0}^{(59)}$$
$$D(G_{8,0}^{(21)}) = +G_{7,0}^{(58)}$$
$$D(G_{8,0}^{(22)}) = +G_{7,0}^{(83)}$$
$$D(G_{8,0}^{(23)}) = +G_{7,0}^{(82)}$$
$$D(G_{8,0}^{(24)}) = +G_{7,0}^{(7)} - G_{7,0}^{(30)}$$
$$D(G_{8,0}^{(25)}) = +G_{7,0}^{(6)} - G_{7,0}^{(31)}$$
$$D(G_{8,0}^{(26)}) = +G_{7,0}^{(9)} - G_{7,0}^{(84)}$$
$$D(G_{8,0}^{(27)}) = +G_{7,0}^{(8)} - G_{7,0}^{(85)}$$
$$D(G_{8,0}^{(28)}) = +G_{7,0}^{(11)}$$
$$D(G_{8,0}^{(29)}) = +G_{7,0}^{(10)}$$
$$D(G_{8,0}^{(30)}) = +G_{7,0}^{(33)} - G_{7,0}^{(86)}$$
$$D(G_{8,0}^{(31)}) = +G_{7,0}^{(32)} - G_{7,0}^{(87)}$$
$$D(G_{8,0}^{(32)}) = +G_{7,0}^{(35)}$$
$$D(G_{8,0}^{(33)}) = +G_{7,0}^{(34)}$$
$$D(G_{8,0}^{(34)}) = +G_{7,0}^{(89)}$$
$$D(G_{8,0}^{(35)}) = +G_{7,0}^{(88)}$$
$$D(G_{8,0}^{(36)}) = +G_{7,0}^{(13)} - G_{7,0}^{(36)}$$
$$D(G_{8,0}^{(37)}) = +G_{7,0}^{(12)} - G_{7,0}^{(37)}$$
$$D(G_{8,0}^{(38)}) = +G_{7,0}^{(15)} - G_{7,0}^{(60)}$$
$$D(G_{8,0}^{(39)}) = +G_{7,0}^{(14)} - G_{7,0}^{(61)}$$
$$D(G_{8,0}^{(40)}) = +G_{7,0}^{(17)}$$
$$D(G_{8,0}^{(41)}) = +G_{7,0}^{(16)}$$
$$D(G_{8,0}^{(42)}) = +G_{7,0}^{(39)} - G_{7,0}^{(62)}$$
$$D(G_{8,0}^{(43)}) = +G_{7,0}^{(38)} - G_{7,0}^{(63)}$$
$$D(G_{8,0}^{(44)}) = +G_{7,0}^{(41)}$$
$$D(G_{8,0}^{(45)}) = +G_{7,0}^{(40)}$$
$$D(G_{8,0}^{(46)}) = +G_{7,0}^{(65)}$$
$$D(G_{8,0}^{(47)}) = +G_{7,0}^{(64)}$$
$$D(G_{8,0}^{(48)}) = +G_{7,0}^{(19)} - G_{7,0}^{(42)}$$
$$D(G_{8,0}^{(49)}) = +G_{7,0}^{(18)} - G_{7,0}^{(43)}$$
$$D(G_{8,0}^{(50)}) = +G_{7,0}^{(21)} - G_{7,0}^{(66)}$$
$$D(G_{8,0}^{(51)}) = +G_{7,0}^{(20)} - G_{7,0}^{(67)}$$
$$D(G_{8,0}^{(52)}) = +G_{7,0}^{(23)} - G_{7,0}^{(90)}$$
$$D(G_{8,0}^{(53)}) = +G_{7,0}^{(22)} - G_{7,0}^{(91)}$$
$$D(G_{8,0}^{(54)}) = +G_{7,0}^{(45)} - G_{7,0}^{(68)}$$
$$D(G_{8,0}^{(55)}) = +G_{7,0}^{(44)} - G_{7,0}^{(69)}$$
$$D(G_{8,0}^{(56)}) = +G_{7,0}^{(47)} - G_{7,0}^{(92)}$$
$$D(G_{8,0}^{(57)}) = +G_{7,0}^{(46)} - G_{7,0}^{(93)}$$
$$D(G_{8,0}^{(58)}) = +G_{7,0}^{(71)} - G_{7,0}^{(94)}$$
$$D(G_{8,0}^{(59)}) = +G_{7,0}^{(70)} - G_{7,0}^{(95)}$$
$$D(G_{8,0}^{(60)}) = -G_{7,0}^{(54)} - G_{7,0}^{(78)}$$
$$D(G_{8,0}^{(61)}) = -G_{7,0}^{(55)} - G_{7,0}^{(102)}$$
$$D(G_{8,0}^{(62)}) = -G_{7,0}^{(54)} - G_{7,0}^{(78)}$$
$$D(G_{8,0}^{(63)}) = -G_{7,0}^{(79)}$$
$$D(G_{8,0}^{(64)}) = -G_{7,0}^{(55)} - G_{7,0}^{(102)}$$
$$D(G_{8,0}^{(65)}) = -G_{7,0}^{(79)}$$
$$D(G_{8,0}^{(66)}) = -G_{7,0}^{(30)} - G_{7,0}^{(84)}$$
$$D(G_{8,0}^{(67)}) = -G_{7,0}^{(31)}$$
$$D(G_{8,0}^{(68)}) = -G_{7,0}^{(30)} - G_{7,0}^{(84)}$$
$$D(G_{8,0}^{(69)}) = -G_{7,0}^{(85)}$$
$$D(G_{8,0}^{(70)}) = -G_{7,0}^{(31)}$$
$$D(G_{8,0}^{(71)}) = -G_{7,0}^{(85)}$$
$$D(G_{8,0}^{(72)}) = -G_{7,0}^{(36)} - G_{7,0}^{(60)}$$
$$D(G_{8,0}^{(73)}) = -G_{7,0}^{(37)}$$
$$D(G_{8,0}^{(74)}) = -G_{7,0}^{(36)} - G_{7,0}^{(60)}$$
$$D(G_{8,0}^{(75)}) = -G_{7,0}^{(61)}$$

$D(G_{8,0}^{(76)}) = -G_{7,0}^{(37)}$
$D(G_{8,0}^{(77)}) = -G_{7,0}^{(61)}$
$D(G_{8,0}^{(78)}) = -G_{7,0}^{(42)} - G_{7,0}^{(66)}$
$D(G_{8,0}^{(79)}) = -G_{7,0}^{(43)} - G_{7,0}^{(90)}$
$D(G_{8,0}^{(80)}) = -G_{7,0}^{(42)} - G_{7,0}^{(66)}$
$D(G_{8,0}^{(81)}) = -G_{7,0}^{(67)} - G_{7,0}^{(91)}$
$D(G_{8,0}^{(82)}) = -G_{7,0}^{(43)} - G_{7,0}^{(90)}$
$D(G_{8,0}^{(83)}) = -G_{7,0}^{(67)} - G_{7,0}^{(91)}$
$D(G_{8,0}^{(84)}) = -G_{7,0}^{(48)} - G_{7,0}^{(72)}$
$D(G_{8,0}^{(85)}) = -G_{7,0}^{(49)} - G_{7,0}^{(96)}$
$D(G_{8,0}^{(86)}) = -G_{7,0}^{(48)} - G_{7,0}^{(72)}$
$D(G_{8,0}^{(87)}) = -G_{7,0}^{(73)} - G_{7,0}^{(97)}$
$D(G_{8,0}^{(88)}) = -G_{7,0}^{(49)} - G_{7,0}^{(96)}$
$D(G_{8,0}^{(89)}) = -G_{7,0}^{(73)} - G_{7,0}^{(97)}$
$D(G_{8,0}^{(90)}) = -G_{7,0}^{(6)} - G_{7,0}^{(86)}$
$D(G_{8,0}^{(91)}) = -G_{7,0}^{(7)}$
$D(G_{8,0}^{(92)}) = -G_{7,0}^{(6)} - G_{7,0}^{(86)}$
$D(G_{8,0}^{(93)}) = -G_{7,0}^{(87)}$
$D(G_{8,0}^{(94)}) = -G_{7,0}^{(7)}$
$D(G_{8,0}^{(95)}) = -G_{7,0}^{(87)}$
$D(G_{8,0}^{(96)}) = -G_{7,0}^{(12)} - G_{7,0}^{(62)}$
$D(G_{8,0}^{(97)}) = -G_{7,0}^{(13)}$
$D(G_{8,0}^{(98)}) = -G_{7,0}^{(12)} - G_{7,0}^{(62)}$
$D(G_{8,0}^{(99)}) = -G_{7,0}^{(63)}$
$D(G_{8,0}^{(100)}) = -G_{7,0}^{(13)}$
$D(G_{8,0}^{(101)}) = -G_{7,0}^{(63)}$
$D(G_{8,0}^{(102)}) = -G_{7,0}^{(18)} - G_{7,0}^{(68)}$
$D(G_{8,0}^{(103)}) = -G_{7,0}^{(19)} - G_{7,0}^{(92)}$
$D(G_{8,0}^{(104)}) = -G_{7,0}^{(18)} - G_{7,0}^{(68)}$
$D(G_{8,0}^{(105)}) = -G_{7,0}^{(69)} - G_{7,0}^{(93)}$
$D(G_{8,0}^{(106)}) = -G_{7,0}^{(19)} - G_{7,0}^{(92)}$
$D(G_{8,0}^{(107)}) = -G_{7,0}^{(69)} - G_{7,0}^{(93)}$
$D(G_{8,0}^{(108)}) = -G_{7,0}^{(24)} - G_{7,0}^{(74)}$
$D(G_{8,0}^{(109)}) = -G_{7,0}^{(25)} - G_{7,0}^{(98)}$
$D(G_{8,0}^{(110)}) = -G_{7,0}^{(24)} - G_{7,0}^{(74)}$
$D(G_{8,0}^{(111)}) = -G_{7,0}^{(75)} - G_{7,0}^{(99)}$
$D(G_{8,0}^{(112)}) = -G_{7,0}^{(25)} - G_{7,0}^{(98)}$
$D(G_{8,0}^{(113)}) = -G_{7,0}^{(75)} - G_{7,0}^{(99)}$
$D(G_{8,0}^{(114)}) = -G_{7,0}^{(0)} - G_{7,0}^{(80)}$
$D(G_{8,0}^{(115)}) = -G_{7,0}^{(1)}$
$D(G_{8,0}^{(116)}) = -G_{7,0}^{(0)} - G_{7,0}^{(80)}$
$D(G_{8,0}^{(117)}) = -G_{7,0}^{(81)}$
$D(G_{8,0}^{(118)}) = -G_{7,0}^{(1)}$
$D(G_{8,0}^{(119)}) = -G_{7,0}^{(81)}$

The Fatgraph $G_{8,1}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([5, 2, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^0a^1) \\
\beta &= ({}^2d^0 \to {}^1a^2 \to {}^2c^0 \to {}^3a^0 \to {}^2e^0 \to {}^1c^2 \to {}^2b^0 \to {}^1b^2 \to {}^1e^2 \to {}^1d^2) \\
\gamma &= ({}^2a^3 \to {}^0d^1 \to {}^0b^1) \\
\delta &= ({}^0c^1) \\
\epsilon &= ({}^0e^1)
\end{aligned}$$

Markings

Fatgraph $G_{8,1}$ only has the identity automorphism, so the marked fatgraphs $G_{8,1}^{(0)}$ to $G_{8,1}^{(120)}$ are formed by decorating boundary cycles of $G_{8,1}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

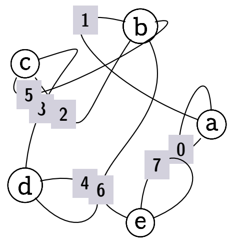
Differentials

$$\begin{aligned}
D(G_{8,1}^{(0)}) &= -G_{7,0}^{(14)} - G_{7,0}^{(38)} \\
D(G_{8,1}^{(1)}) &= -G_{7,0}^{(15)} \\
D(G_{8,1}^{(2)}) &= -G_{7,0}^{(14)} - G_{7,0}^{(38)} \\
D(G_{8,1}^{(3)}) &= -G_{7,0}^{(39)} \\
D(G_{8,1}^{(4)}) &= -G_{7,0}^{(15)} \\
D(G_{8,1}^{(5)}) &= -G_{7,0}^{(39)} \\
D(G_{8,1}^{(6)}) &= -G_{7,0}^{(20)} - G_{7,0}^{(44)} \\
D(G_{8,1}^{(7)}) &= -G_{7,0}^{(21)} - G_{7,0}^{(94)} \\
D(G_{8,1}^{(8)}) &= -G_{7,0}^{(20)} - G_{7,0}^{(44)} \\
D(G_{8,1}^{(9)}) &= -G_{7,0}^{(45)} - G_{7,0}^{(95)} \\
D(G_{8,1}^{(10)}) &= -G_{7,0}^{(21)} - G_{7,0}^{(94)} \\
D(G_{8,1}^{(11)}) &= -G_{7,0}^{(45)} - G_{7,0}^{(95)} \\
D(G_{8,1}^{(12)}) &= -G_{7,0}^{(26)} - G_{7,0}^{(50)} \\
D(G_{8,1}^{(13)}) &= -G_{7,0}^{(27)} - G_{7,0}^{(100)} \\
D(G_{8,1}^{(14)}) &= -G_{7,0}^{(26)} - G_{7,0}^{(50)} \\
D(G_{8,1}^{(15)}) &= -G_{7,0}^{(51)} - G_{7,0}^{(101)} \\
D(G_{8,1}^{(16)}) &= -G_{7,0}^{(27)} - G_{7,0}^{(100)} \\
D(G_{8,1}^{(17)}) &= -G_{7,0}^{(51)} - G_{7,0}^{(101)} \\
D(G_{8,1}^{(18)}) &= -G_{7,0}^{(2)} - G_{7,0}^{(56)} \\
D(G_{8,1}^{(19)}) &= -G_{7,0}^{(3)} \\
D(G_{8,1}^{(20)}) &= -G_{7,0}^{(2)} - G_{7,0}^{(56)} \\
D(G_{8,1}^{(21)}) &= -G_{7,0}^{(57)}
\end{aligned}$$

$$\begin{aligned}
D(G_{8,1}^{(22)}) &= -G_{7,0}^{(3)} \\
D(G_{8,1}^{(23)}) &= -G_{7,0}^{(57)} \\
D(G_{8,1}^{(24)}) &= -G_{7,0}^{(8)} - G_{7,0}^{(32)} \\
D(G_{8,1}^{(25)}) &= -G_{7,0}^{(9)} \\
D(G_{8,1}^{(26)}) &= -G_{7,0}^{(8)} - G_{7,0}^{(32)} \\
D(G_{8,1}^{(27)}) &= -G_{7,0}^{(33)} \\
D(G_{8,1}^{(28)}) &= -G_{7,0}^{(9)} \\
D(G_{8,1}^{(29)}) &= -G_{7,0}^{(33)} \\
D(G_{8,1}^{(30)}) &= -G_{7,0}^{(22)} - G_{7,0}^{(46)} \\
D(G_{8,1}^{(31)}) &= -G_{7,0}^{(23)} - G_{7,0}^{(70)} \\
D(G_{8,1}^{(32)}) &= -G_{7,0}^{(22)} - G_{7,0}^{(46)} \\
D(G_{8,1}^{(33)}) &= -G_{7,0}^{(47)} - G_{7,0}^{(71)} \\
D(G_{8,1}^{(34)}) &= -G_{7,0}^{(23)} - G_{7,0}^{(70)} \\
D(G_{8,1}^{(35)}) &= -G_{7,0}^{(47)} - G_{7,0}^{(71)} \\
D(G_{8,1}^{(36)}) &= -G_{7,0}^{(28)} - G_{7,0}^{(52)} \\
D(G_{8,1}^{(37)}) &= -G_{7,0}^{(29)} - G_{7,0}^{(76)} \\
D(G_{8,1}^{(38)}) &= -G_{7,0}^{(28)} - G_{7,0}^{(52)} \\
D(G_{8,1}^{(39)}) &= -G_{7,0}^{(53)} - G_{7,0}^{(77)} \\
D(G_{8,1}^{(40)}) &= -G_{7,0}^{(29)} - G_{7,0}^{(76)} \\
D(G_{8,1}^{(41)}) &= -G_{7,0}^{(53)} - G_{7,0}^{(77)} \\
D(G_{8,1}^{(42)}) &= -G_{7,0}^{(4)} - G_{7,0}^{(58)} \\
D(G_{8,1}^{(43)}) &= -G_{7,0}^{(5)} - G_{7,0}^{(82)}
\end{aligned}$$

$D(G_{8,1}^{(44)}) = -G_{7,0}^{(4)} - G_{7,0}^{(58)}$
$D(G_{8,1}^{(45)}) = -G_{7,0}^{(59)} - G_{7,0}^{(83)}$
$D(G_{8,1}^{(46)}) = -G_{7,0}^{(5)} - G_{7,0}^{(82)}$
$D(G_{8,1}^{(47)}) = -G_{7,0}^{(59)} - G_{7,0}^{(83)}$
$D(G_{8,1}^{(48)}) = -G_{7,0}^{(10)} - G_{7,0}^{(34)}$
$D(G_{8,1}^{(49)}) = -G_{7,0}^{(11)} - G_{7,0}^{(88)}$
$D(G_{8,1}^{(50)}) = -G_{7,0}^{(10)} - G_{7,0}^{(34)}$
$D(G_{8,1}^{(51)}) = -G_{7,0}^{(35)} - G_{7,0}^{(89)}$
$D(G_{8,1}^{(52)}) = -G_{7,0}^{(11)} - G_{7,0}^{(88)}$
$D(G_{8,1}^{(53)}) = -G_{7,0}^{(35)} - G_{7,0}^{(89)}$
$D(G_{8,1}^{(54)}) = -G_{7,0}^{(16)} - G_{7,0}^{(40)}$
$D(G_{8,1}^{(55)}) = -G_{7,0}^{(17)} - G_{7,0}^{(64)}$
$D(G_{8,1}^{(56)}) = -G_{7,0}^{(16)} - G_{7,0}^{(40)}$
$D(G_{8,1}^{(57)}) = -G_{7,0}^{(41)} - G_{7,0}^{(65)}$
$D(G_{8,1}^{(58)}) = -G_{7,0}^{(17)} - G_{7,0}^{(64)}$
$D(G_{8,1}^{(59)}) = -G_{7,0}^{(41)} - G_{7,0}^{(65)}$
$D(G_{8,1}^{(60)}) = +G_{7,0}^{(52)} + G_{7,0}^{(72)}$
$D(G_{8,1}^{(61)}) = +G_{7,0}^{(50)} + G_{7,0}^{(96)}$
$D(G_{8,1}^{(62)}) = +G_{7,0}^{(48)} + G_{7,0}^{(76)}$
$D(G_{8,1}^{(63)}) = +G_{7,0}^{(74)} + G_{7,0}^{(97)}$
$D(G_{8,1}^{(64)}) = +G_{7,0}^{(49)} + G_{7,0}^{(100)}$
$D(G_{8,1}^{(65)}) = +G_{7,0}^{(73)} + G_{7,0}^{(98)}$
$D(G_{8,1}^{(66)}) = +G_{7,0}^{(28)} + G_{7,0}^{(74)}$
$D(G_{8,1}^{(67)}) = +G_{7,0}^{(26)} + G_{7,0}^{(98)}$
$D(G_{8,1}^{(68)}) = +G_{7,0}^{(24)} + G_{7,0}^{(77)}$
$D(G_{8,1}^{(69)}) = +G_{7,0}^{(72)} + G_{7,0}^{(99)}$
$D(G_{8,1}^{(70)}) = +G_{7,0}^{(25)} + G_{7,0}^{(101)}$
$D(G_{8,1}^{(71)}) = +G_{7,0}^{(75)} + G_{7,0}^{(96)}$
$D(G_{8,1}^{(72)}) = +G_{7,0}^{(29)} + G_{7,0}^{(50)}$
$D(G_{8,1}^{(73)}) = +G_{7,0}^{(24)} + G_{7,0}^{(100)}$
$D(G_{8,1}^{(74)}) = +G_{7,0}^{(26)} + G_{7,0}^{(53)}$
$D(G_{8,1}^{(75)}) = +G_{7,0}^{(48)} + G_{7,0}^{(101)}$
$D(G_{8,1}^{(76)}) = +G_{7,0}^{(27)} + G_{7,0}^{(99)}$
$D(G_{8,1}^{(77)}) = +G_{7,0}^{(51)} + G_{7,0}^{(97)}$
$D(G_{8,1}^{(78)}) = +G_{7,0}^{(27)} + G_{7,0}^{(52)}$
$D(G_{8,1}^{(79)}) = +G_{7,0}^{(25)} + G_{7,0}^{(76)}$
$D(G_{8,1}^{(80)}) = +G_{7,0}^{(28)} + G_{7,0}^{(51)}$
$D(G_{8,1}^{(81)}) = +G_{7,0}^{(49)} + G_{7,0}^{(77)}$
$D(G_{8,1}^{(82)}) = +G_{7,0}^{(29)} + G_{7,0}^{(75)}$
$D(G_{8,1}^{(83)}) = +G_{7,0}^{(53)} + G_{7,0}^{(73)}$
$D(G_{8,1}^{(84)}) = +G_{7,0}^{(58)} + G_{7,0}^{(78)}$
$D(G_{8,1}^{(85)}) = +G_{7,0}^{(56)} + G_{7,0}^{(102)}$
$D(G_{8,1}^{(86)}) = +G_{7,0}^{(54)} + G_{7,0}^{(82)}$
$D(G_{8,1}^{(87)}) = +G_{7,0}^{(80)}$
$D(G_{8,1}^{(88)}) = +G_{7,0}^{(55)}$
$D(G_{8,1}^{(89)}) = +G_{7,0}^{(79)}$
$D(G_{8,1}^{(90)}) = +G_{7,0}^{(4)} + G_{7,0}^{(80)}$
$D(G_{8,1}^{(91)}) = +G_{7,0}^{(2)}$
$D(G_{8,1}^{(92)}) = +G_{7,0}^{(0)} + G_{7,0}^{(83)}$
$D(G_{8,1}^{(93)}) = +G_{7,0}^{(78)}$
$D(G_{8,1}^{(94)}) = +G_{7,0}^{(1)}$
$D(G_{8,1}^{(95)}) = +G_{7,0}^{(81)} + G_{7,0}^{(102)}$
$D(G_{8,1}^{(96)}) = +G_{7,0}^{(5)} + G_{7,0}^{(56)}$
$D(G_{8,1}^{(97)}) = +G_{7,0}^{(0)}$
$D(G_{8,1}^{(98)}) = +G_{7,0}^{(2)} + G_{7,0}^{(59)}$
$D(G_{8,1}^{(99)}) = +G_{7,0}^{(54)}$
$D(G_{8,1}^{(100)}) = +G_{7,0}^{(3)}$
$D(G_{8,1}^{(101)}) = +G_{7,0}^{(57)}$
$D(G_{8,1}^{(102)}) = +G_{7,0}^{(3)} + G_{7,0}^{(58)}$
$D(G_{8,1}^{(103)}) = +G_{7,0}^{(1)} + G_{7,0}^{(82)}$
$D(G_{8,1}^{(104)}) = +G_{7,0}^{(4)} + G_{7,0}^{(57)}$
$D(G_{8,1}^{(105)}) = +G_{7,0}^{(55)} + G_{7,0}^{(83)}$
$D(G_{8,1}^{(106)}) = +G_{7,0}^{(5)} + G_{7,0}^{(81)}$
$D(G_{8,1}^{(107)}) = +G_{7,0}^{(59)} + G_{7,0}^{(79)}$
$D(G_{8,1}^{(108)}) = +G_{7,0}^{(34)} + G_{7,0}^{(84)}$
$D(G_{8,1}^{(109)}) = +G_{7,0}^{(32)}$
$D(G_{8,1}^{(110)}) = +G_{7,0}^{(30)} + G_{7,0}^{(88)}$
$D(G_{8,1}^{(111)}) = +G_{7,0}^{(86)}$
$D(G_{8,1}^{(112)}) = +G_{7,0}^{(31)}$
$D(G_{8,1}^{(113)}) = +G_{7,0}^{(85)}$
$D(G_{8,1}^{(114)}) = +G_{7,0}^{(10)} + G_{7,0}^{(86)}$
$D(G_{8,1}^{(115)}) = +G_{7,0}^{(8)}$
$D(G_{8,1}^{(116)}) = +G_{7,0}^{(6)} + G_{7,0}^{(89)}$
$D(G_{8,1}^{(117)}) = +G_{7,0}^{(84)}$
$D(G_{8,1}^{(118)}) = +G_{7,0}^{(7)}$
$D(G_{8,1}^{(119)}) = +G_{7,0}^{(87)}$

The Fatgraph $G_{8,2}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),   # a
  Vertex([1, 2, 6, 5]),# b
  Vertex([5, 2, 3]),   # c
  Vertex([4, 4, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{3}b^{0} \to {}^{1}c^{2} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\beta = ({}^{2}a^{0})$$
$$\gamma = ({}^{2}b^{3} \to {}^{1}e^{2} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,2}$ only has the identity automorphism, so the marked fatgraphs $G_{8,2}^{(0)}$ to $G_{8,2}^{(120)}$ are formed by decorating boundary cycles of $G_{8,2}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

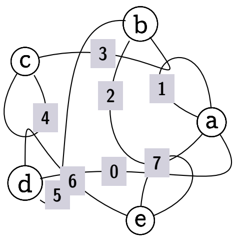
Differentials

$$D(G_{8,2}^{(0)}) = +G_{7,0}^{(11)} + G_{7,0}^{(32)}$$
$$D(G_{8,2}^{(1)}) = +G_{7,0}^{(6)}$$
$$D(G_{8,2}^{(2)}) = +G_{7,0}^{(8)} + G_{7,0}^{(35)}$$
$$D(G_{8,2}^{(3)}) = +G_{7,0}^{(30)}$$
$$D(G_{8,2}^{(4)}) = +G_{7,0}^{(9)}$$
$$D(G_{8,2}^{(5)}) = +G_{7,0}^{(33)}$$
$$D(G_{8,2}^{(6)}) = +G_{7,0}^{(9)} + G_{7,0}^{(34)}$$
$$D(G_{8,2}^{(7)}) = +G_{7,0}^{(7)} + G_{7,0}^{(88)}$$
$$D(G_{8,2}^{(8)}) = +G_{7,0}^{(10)} + G_{7,0}^{(33)}$$
$$D(G_{8,2}^{(9)}) = +G_{7,0}^{(31)} + G_{7,0}^{(89)}$$
$$D(G_{8,2}^{(10)}) = +G_{7,0}^{(11)} + G_{7,0}^{(87)}$$
$$D(G_{8,2}^{(11)}) = +G_{7,0}^{(35)} + G_{7,0}^{(85)}$$
$$D(G_{8,2}^{(12)}) = +G_{7,0}^{(40)} + G_{7,0}^{(60)}$$
$$D(G_{8,2}^{(13)}) = +G_{7,0}^{(38)}$$
$$D(G_{8,2}^{(14)}) = +G_{7,0}^{(36)} + G_{7,0}^{(64)}$$
$$D(G_{8,2}^{(15)}) = +G_{7,0}^{(62)}$$
$$D(G_{8,2}^{(16)}) = +G_{7,0}^{(37)}$$
$$D(G_{8,2}^{(17)}) = +G_{7,0}^{(61)}$$
$$D(G_{8,2}^{(18)}) = +G_{7,0}^{(16)} + G_{7,0}^{(62)}$$
$$D(G_{8,2}^{(19)}) = +G_{7,0}^{(14)}$$
$$D(G_{8,2}^{(20)}) = +G_{7,0}^{(12)} + G_{7,0}^{(65)}$$
$$D(G_{8,2}^{(21)}) = +G_{7,0}^{(60)}$$
$$D(G_{8,2}^{(22)}) = +G_{7,0}^{(13)}$$
$$D(G_{8,2}^{(23)}) = +G_{7,0}^{(63)}$$

$$D(G_{8,2}^{(24)}) = +G_{7,0}^{(17)} + G_{7,0}^{(38)}$$
$$D(G_{8,2}^{(25)}) = +G_{7,0}^{(12)}$$
$$D(G_{8,2}^{(26)}) = +G_{7,0}^{(14)} + G_{7,0}^{(41)}$$
$$D(G_{8,2}^{(27)}) = +G_{7,0}^{(36)}$$
$$D(G_{8,2}^{(28)}) = +G_{7,0}^{(15)}$$
$$D(G_{8,2}^{(29)}) = +G_{7,0}^{(39)}$$
$$D(G_{8,2}^{(30)}) = +G_{7,0}^{(15)} + G_{7,0}^{(40)}$$
$$D(G_{8,2}^{(31)}) = +G_{7,0}^{(13)} + G_{7,0}^{(64)}$$
$$D(G_{8,2}^{(32)}) = +G_{7,0}^{(16)} + G_{7,0}^{(39)}$$
$$D(G_{8,2}^{(33)}) = +G_{7,0}^{(37)} + G_{7,0}^{(65)}$$
$$D(G_{8,2}^{(34)}) = +G_{7,0}^{(17)} + G_{7,0}^{(63)}$$
$$D(G_{8,2}^{(35)}) = +G_{7,0}^{(41)} + G_{7,0}^{(61)}$$
$$D(G_{8,2}^{(36)}) = +G_{7,0}^{(46)} + G_{7,0}^{(66)}$$
$$D(G_{8,2}^{(37)}) = +G_{7,0}^{(44)} + G_{7,0}^{(90)}$$
$$D(G_{8,2}^{(38)}) = +G_{7,0}^{(42)} + G_{7,0}^{(70)}$$
$$D(G_{8,2}^{(39)}) = +G_{7,0}^{(68)} + G_{7,0}^{(91)}$$
$$D(G_{8,2}^{(40)}) = +G_{7,0}^{(43)} + G_{7,0}^{(94)}$$
$$D(G_{8,2}^{(41)}) = +G_{7,0}^{(67)} + G_{7,0}^{(92)}$$
$$D(G_{8,2}^{(42)}) = +G_{7,0}^{(22)} + G_{7,0}^{(68)}$$
$$D(G_{8,2}^{(43)}) = +G_{7,0}^{(20)} + G_{7,0}^{(92)}$$
$$D(G_{8,2}^{(44)}) = +G_{7,0}^{(18)} + G_{7,0}^{(71)}$$
$$D(G_{8,2}^{(45)}) = +G_{7,0}^{(66)} + G_{7,0}^{(93)}$$
$$D(G_{8,2}^{(46)}) = +G_{7,0}^{(19)} + G_{7,0}^{(95)}$$
$$D(G_{8,2}^{(47)}) = +G_{7,0}^{(69)} + G_{7,0}^{(90)}$$
$$D(G_{8,2}^{(48)}) = +G_{7,0}^{(23)} + G_{7,0}^{(44)}$$
$$D(G_{8,2}^{(49)}) = +G_{7,0}^{(18)} + G_{7,0}^{(94)}$$
$$D(G_{8,2}^{(50)}) = +G_{7,0}^{(20)} + G_{7,0}^{(47)}$$
$$D(G_{8,2}^{(51)}) = +G_{7,0}^{(42)} + G_{7,0}^{(95)}$$
$$D(G_{8,2}^{(52)}) = +G_{7,0}^{(21)} + G_{7,0}^{(93)}$$
$$D(G_{8,2}^{(53)}) = +G_{7,0}^{(45)} + G_{7,0}^{(91)}$$
$$D(G_{8,2}^{(54)}) = +G_{7,0}^{(21)} + G_{7,0}^{(46)}$$
$$D(G_{8,2}^{(55)}) = +G_{7,0}^{(19)} + G_{7,0}^{(70)}$$
$$D(G_{8,2}^{(56)}) = +G_{7,0}^{(22)} + G_{7,0}^{(45)}$$
$$D(G_{8,2}^{(57)}) = +G_{7,0}^{(43)} + G_{7,0}^{(71)}$$
$$D(G_{8,2}^{(58)}) = +G_{7,0}^{(23)} + G_{7,0}^{(69)}$$
$$D(G_{8,2}^{(59)}) = +G_{7,0}^{(47)} + G_{7,0}^{(67)}$$
$$D(G_{8,2}^{(60)}) = -G_{7,0}^{(0)} + G_{7,0}^{(56)}$$
$$D(G_{8,2}^{(61)}) = -G_{7,0}^{(1)} + G_{7,0}^{(58)}$$
$$D(G_{8,2}^{(62)}) = -G_{7,0}^{(2)} + G_{7,0}^{(80)}$$
$$D(G_{8,2}^{(63)}) = -G_{7,0}^{(3)} + G_{7,0}^{(82)}$$
$$D(G_{8,2}^{(64)}) = -G_{7,0}^{(4)}$$
$$D(G_{8,2}^{(65)}) = -G_{7,0}^{(5)}$$
$$D(G_{8,2}^{(66)}) = -G_{7,0}^{(6)} + G_{7,0}^{(32)}$$
$$D(G_{8,2}^{(67)}) = -G_{7,0}^{(7)} + G_{7,0}^{(34)}$$
$$D(G_{8,2}^{(68)}) = -G_{7,0}^{(8)} + G_{7,0}^{(86)}$$
$$D(G_{8,2}^{(69)}) = -G_{7,0}^{(9)} + G_{7,0}^{(88)}$$
$$D(G_{8,2}^{(70)}) = -G_{7,0}^{(10)}$$
$$D(G_{8,2}^{(71)}) = -G_{7,0}^{(11)}$$
$$D(G_{8,2}^{(72)}) = -G_{7,0}^{(12)} + G_{7,0}^{(38)}$$
$$D(G_{8,2}^{(73)}) = -G_{7,0}^{(13)} + G_{7,0}^{(40)}$$
$$D(G_{8,2}^{(74)}) = -G_{7,0}^{(14)} + G_{7,0}^{(62)}$$
$$D(G_{8,2}^{(75)}) = -G_{7,0}^{(15)} + G_{7,0}^{(64)}$$
$$D(G_{8,2}^{(76)}) = -G_{7,0}^{(16)}$$
$$D(G_{8,2}^{(77)}) = -G_{7,0}^{(17)}$$
$$D(G_{8,2}^{(78)}) = -G_{7,0}^{(18)} + G_{7,0}^{(44)}$$
$$D(G_{8,2}^{(79)}) = -G_{7,0}^{(19)} + G_{7,0}^{(46)}$$
$$D(G_{8,2}^{(80)}) = -G_{7,0}^{(20)} + G_{7,0}^{(68)}$$
$$D(G_{8,2}^{(81)}) = -G_{7,0}^{(21)} + G_{7,0}^{(70)}$$
$$D(G_{8,2}^{(82)}) = -G_{7,0}^{(22)} + G_{7,0}^{(92)}$$
$$D(G_{8,2}^{(83)}) = -G_{7,0}^{(23)} + G_{7,0}^{(94)}$$
$$D(G_{8,2}^{(84)}) = -G_{7,0}^{(24)} + G_{7,0}^{(50)}$$
$$D(G_{8,2}^{(85)}) = -G_{7,0}^{(25)} + G_{7,0}^{(52)}$$
$$D(G_{8,2}^{(86)}) = -G_{7,0}^{(26)} + G_{7,0}^{(74)}$$
$$D(G_{8,2}^{(87)}) = -G_{7,0}^{(27)} + G_{7,0}^{(76)}$$
$$D(G_{8,2}^{(88)}) = -G_{7,0}^{(28)} + G_{7,0}^{(98)}$$
$$D(G_{8,2}^{(89)}) = -G_{7,0}^{(29)} + G_{7,0}^{(100)}$$
$$D(G_{8,2}^{(90)}) = +G_{7,0}^{(8)} - G_{7,0}^{(30)}$$
$$D(G_{8,2}^{(91)}) = +G_{7,0}^{(10)} - G_{7,0}^{(31)}$$
$$D(G_{8,2}^{(92)}) = -G_{7,0}^{(32)} + G_{7,0}^{(84)}$$
$$D(G_{8,2}^{(93)}) = -G_{7,0}^{(33)} + G_{7,0}^{(89)}$$
$$D(G_{8,2}^{(94)}) = -G_{7,0}^{(34)}$$
$$D(G_{8,2}^{(95)}) = -G_{7,0}^{(35)}$$
$$D(G_{8,2}^{(96)}) = +G_{7,0}^{(14)} - G_{7,0}^{(36)}$$
$$D(G_{8,2}^{(97)}) = +G_{7,0}^{(16)} - G_{7,0}^{(37)}$$
$$D(G_{8,2}^{(98)}) = -G_{7,0}^{(38)} + G_{7,0}^{(60)}$$
$$D(G_{8,2}^{(99)}) = -G_{7,0}^{(39)} + G_{7,0}^{(65)}$$

$D(G_{8,2}^{(100)}) = -G_{7,0}^{(40)}$
$D(G_{8,2}^{(101)}) = -G_{7,0}^{(41)}$
$D(G_{8,2}^{(102)}) = +G_{7,0}^{(20)} - G_{7,0}^{(42)}$
$D(G_{8,2}^{(103)}) = +G_{7,0}^{(22)} - G_{7,0}^{(43)}$
$D(G_{8,2}^{(104)}) = -G_{7,0}^{(44)} + G_{7,0}^{(66)}$
$D(G_{8,2}^{(105)}) = -G_{7,0}^{(45)} + G_{7,0}^{(71)}$
$D(G_{8,2}^{(106)}) = -G_{7,0}^{(46)} + G_{7,0}^{(90)}$
$D(G_{8,2}^{(107)}) = -G_{7,0}^{(47)} + G_{7,0}^{(95)}$
$D(G_{8,2}^{(108)}) = +G_{7,0}^{(26)} - G_{7,0}^{(48)}$
$D(G_{8,2}^{(109)}) = +G_{7,0}^{(28)} - G_{7,0}^{(49)}$
$D(G_{8,2}^{(110)}) = -G_{7,0}^{(50)} + G_{7,0}^{(72)}$
$D(G_{8,2}^{(111)}) = -G_{7,0}^{(51)} + G_{7,0}^{(77)}$
$D(G_{8,2}^{(112)}) = -G_{7,0}^{(52)} + G_{7,0}^{(96)}$
$D(G_{8,2}^{(113)}) = -G_{7,0}^{(53)} + G_{7,0}^{(101)}$
$D(G_{8,2}^{(114)}) = +G_{7,0}^{(2)} - G_{7,0}^{(54)}$
$D(G_{8,2}^{(115)}) = +G_{7,0}^{(4)} - G_{7,0}^{(55)}$
$D(G_{8,2}^{(116)}) = -G_{7,0}^{(56)} + G_{7,0}^{(78)}$
$D(G_{8,2}^{(117)}) = -G_{7,0}^{(57)} + G_{7,0}^{(83)}$
$D(G_{8,2}^{(118)}) = -G_{7,0}^{(58)} + G_{7,0}^{(102)}$
$D(G_{8,2}^{(119)}) = -G_{7,0}^{(59)}$

The Fatgraph $G_{8,3}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 1, 2, 0]),# a
  Vertex([5, 2, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

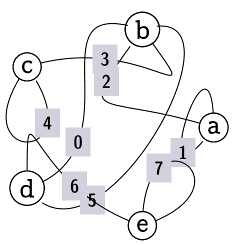
Fatgraph $G_{8,3}$ only has the identity automorphism, so the marked fatgraphs $G_{8,3}^{(0)}$ to $G_{8,3}^{(120)}$ are formed by decorating boundary cycles of $G_{8,3}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{8,3}^{(0)}) = +G_{7,0}^{(12)} - G_{7,0}^{(60)}$$
$$D(G_{8,3}^{(1)}) = +G_{7,0}^{(17)} - G_{7,0}^{(61)}$$
$$D(G_{8,3}^{(2)}) = +G_{7,0}^{(36)} - G_{7,0}^{(62)}$$
$$D(G_{8,3}^{(3)}) = +G_{7,0}^{(41)} - G_{7,0}^{(63)}$$
$$D(G_{8,3}^{(4)}) = -G_{7,0}^{(64)}$$
$$D(G_{8,3}^{(5)}) = -G_{7,0}^{(65)}$$
$$D(G_{8,3}^{(6)}) = +G_{7,0}^{(18)} - G_{7,0}^{(66)}$$
$$D(G_{8,3}^{(7)}) = +G_{7,0}^{(23)} - G_{7,0}^{(67)}$$
$$D(G_{8,3}^{(8)}) = +G_{7,0}^{(42)} - G_{7,0}^{(68)}$$
$$D(G_{8,3}^{(9)}) = +G_{7,0}^{(47)} - G_{7,0}^{(69)}$$
$$D(G_{8,3}^{(10)}) = -G_{7,0}^{(70)} + G_{7,0}^{(91)}$$
$$D(G_{8,3}^{(11)}) = -G_{7,0}^{(71)} + G_{7,0}^{(93)}$$
$$D(G_{8,3}^{(12)}) = +G_{7,0}^{(24)} - G_{7,0}^{(72)}$$
$$D(G_{8,3}^{(13)}) = +G_{7,0}^{(29)} - G_{7,0}^{(73)}$$
$$D(G_{8,3}^{(14)}) = +G_{7,0}^{(48)} - G_{7,0}^{(74)}$$
$$D(G_{8,3}^{(15)}) = +G_{7,0}^{(53)} - G_{7,0}^{(75)}$$
$$D(G_{8,3}^{(16)}) = -G_{7,0}^{(76)} + G_{7,0}^{(97)}$$
$$D(G_{8,3}^{(17)}) = -G_{7,0}^{(77)} + G_{7,0}^{(99)}$$
$$D(G_{8,3}^{(18)}) = +G_{7,0}^{(0)} - G_{7,0}^{(78)}$$
$$D(G_{8,3}^{(19)}) = +G_{7,0}^{(5)} - G_{7,0}^{(79)}$$
$$D(G_{8,3}^{(20)}) = +G_{7,0}^{(54)} - G_{7,0}^{(80)}$$
$$D(G_{8,3}^{(21)}) = +G_{7,0}^{(59)} - G_{7,0}^{(81)}$$
$$D(G_{8,3}^{(22)}) = -G_{7,0}^{(82)}$$
$$D(G_{8,3}^{(23)}) = -G_{7,0}^{(83)}$$
$$D(G_{8,3}^{(24)}) = +G_{7,0}^{(6)} - G_{7,0}^{(84)}$$
$$D(G_{8,3}^{(25)}) = +G_{7,0}^{(11)} - G_{7,0}^{(85)}$$
$$D(G_{8,3}^{(26)}) = +G_{7,0}^{(30)} - G_{7,0}^{(86)}$$
$$D(G_{8,3}^{(27)}) = +G_{7,0}^{(35)} - G_{7,0}^{(87)}$$
$$D(G_{8,3}^{(28)}) = -G_{7,0}^{(88)}$$
$$D(G_{8,3}^{(29)}) = -G_{7,0}^{(89)}$$
$$D(G_{8,3}^{(30)}) = +G_{7,0}^{(19)} - G_{7,0}^{(90)}$$
$$D(G_{8,3}^{(31)}) = +G_{7,0}^{(21)} - G_{7,0}^{(91)}$$
$$D(G_{8,3}^{(32)}) = +G_{7,0}^{(43)} - G_{7,0}^{(92)}$$
$$D(G_{8,3}^{(33)}) = +G_{7,0}^{(45)} - G_{7,0}^{(93)}$$
$$D(G_{8,3}^{(34)}) = +G_{7,0}^{(67)} - G_{7,0}^{(94)}$$
$$D(G_{8,3}^{(35)}) = +G_{7,0}^{(69)} - G_{7,0}^{(95)}$$
$$D(G_{8,3}^{(36)}) = +G_{7,0}^{(25)} - G_{7,0}^{(96)}$$
$$D(G_{8,3}^{(37)}) = +G_{7,0}^{(27)} - G_{7,0}^{(97)}$$
$$D(G_{8,3}^{(38)}) = +G_{7,0}^{(49)} - G_{7,0}^{(98)}$$
$$D(G_{8,3}^{(39)}) = +G_{7,0}^{(51)} - G_{7,0}^{(99)}$$
$$D(G_{8,3}^{(40)}) = +G_{7,0}^{(73)} - G_{7,0}^{(100)}$$
$$D(G_{8,3}^{(41)}) = +G_{7,0}^{(75)} - G_{7,0}^{(101)}$$
$$D(G_{8,3}^{(42)}) = +G_{7,0}^{(1)} - G_{7,0}^{(102)}$$
$$D(G_{8,3}^{(43)}) = +G_{7,0}^{(3)}$$
$$D(G_{8,3}^{(44)}) = +G_{7,0}^{(55)}$$
$$D(G_{8,3}^{(45)}) = +G_{7,0}^{(57)}$$
$$D(G_{8,3}^{(46)}) = +G_{7,0}^{(79)}$$
$$D(G_{8,3}^{(47)}) = +G_{7,0}^{(81)}$$
$$D(G_{8,3}^{(48)}) = +G_{7,0}^{(7)}$$
$$D(G_{8,3}^{(49)}) = +G_{7,0}^{(9)}$$
$$D(G_{8,3}^{(50)}) = +G_{7,0}^{(31)}$$
$$D(G_{8,3}^{(51)}) = +G_{7,0}^{(33)}$$
$$D(G_{8,3}^{(52)}) = +G_{7,0}^{(85)}$$
$$D(G_{8,3}^{(53)}) = +G_{7,0}^{(87)}$$
$$D(G_{8,3}^{(54)}) = +G_{7,0}^{(13)}$$
$$D(G_{8,3}^{(55)}) = +G_{7,0}^{(15)}$$
$$D(G_{8,3}^{(56)}) = +G_{7,0}^{(37)}$$
$$D(G_{8,3}^{(57)}) = +G_{7,0}^{(39)}$$
$$D(G_{8,3}^{(58)}) = +G_{7,0}^{(61)}$$
$$D(G_{8,3}^{(59)}) = +G_{7,0}^{(63)}$$
$$D(G_{8,3}^{(60)}) = -G_{7,0}^{(75)} - G_{7,0}^{(77)}$$
$$D(G_{8,3}^{(61)}) = -G_{7,0}^{(99)} - G_{7,0}^{(101)}$$
$$D(G_{8,3}^{(62)}) = -G_{7,0}^{(51)} - G_{7,0}^{(53)}$$
$$D(G_{8,3}^{(63)}) = -G_{7,0}^{(99)} - G_{7,0}^{(101)}$$
$$D(G_{8,3}^{(64)}) = -G_{7,0}^{(51)} - G_{7,0}^{(53)}$$
$$D(G_{8,3}^{(65)}) = -G_{7,0}^{(75)} - G_{7,0}^{(77)}$$
$$D(G_{8,3}^{(66)}) = -G_{7,0}^{(73)} - G_{7,0}^{(76)}$$
$$D(G_{8,3}^{(67)}) = -G_{7,0}^{(97)} - G_{7,0}^{(100)}$$
$$D(G_{8,3}^{(68)}) = -G_{7,0}^{(27)} - G_{7,0}^{(29)}$$
$$D(G_{8,3}^{(69)}) = -G_{7,0}^{(97)} - G_{7,0}^{(100)}$$
$$D(G_{8,3}^{(70)}) = -G_{7,0}^{(27)} - G_{7,0}^{(29)}$$
$$D(G_{8,3}^{(71)}) = -G_{7,0}^{(73)} - G_{7,0}^{(76)}$$
$$D(G_{8,3}^{(72)}) = -G_{7,0}^{(49)} - G_{7,0}^{(52)}$$
$$D(G_{8,3}^{(73)}) = -G_{7,0}^{(96)} - G_{7,0}^{(98)}$$
$$D(G_{8,3}^{(74)}) = -G_{7,0}^{(25)} - G_{7,0}^{(28)}$$
$$D(G_{8,3}^{(75)}) = -G_{7,0}^{(96)} - G_{7,0}^{(98)}$$

$$D(G_{8,3}^{(76)}) = -G_{7,0}^{(25)} - G_{7,0}^{(28)}$$
$$D(G_{8,3}^{(77)}) = -G_{7,0}^{(49)} - G_{7,0}^{(52)}$$
$$D(G_{8,3}^{(78)}) = -G_{7,0}^{(48)} - G_{7,0}^{(50)}$$
$$D(G_{8,3}^{(79)}) = -G_{7,0}^{(72)} - G_{7,0}^{(74)}$$
$$D(G_{8,3}^{(80)}) = -G_{7,0}^{(24)} - G_{7,0}^{(26)}$$
$$D(G_{8,3}^{(81)}) = -G_{7,0}^{(72)} - G_{7,0}^{(74)}$$
$$D(G_{8,3}^{(82)}) = -G_{7,0}^{(24)} - G_{7,0}^{(26)}$$
$$D(G_{8,3}^{(83)}) = -G_{7,0}^{(48)} - G_{7,0}^{(50)}$$
$$D(G_{8,3}^{(84)}) = -G_{7,0}^{(81)} - G_{7,0}^{(83)}$$
$$D(G_{8,3}^{(86)}) = -G_{7,0}^{(57)} - G_{7,0}^{(59)}$$
$$D(G_{8,3}^{(88)}) = -G_{7,0}^{(57)} - G_{7,0}^{(59)}$$
$$D(G_{8,3}^{(89)}) = -G_{7,0}^{(81)} - G_{7,0}^{(83)}$$
$$D(G_{8,3}^{(90)}) = -G_{7,0}^{(79)} - G_{7,0}^{(82)}$$
$$D(G_{8,3}^{(92)}) = -G_{7,0}^{(3)} - G_{7,0}^{(5)}$$
$$D(G_{8,3}^{(94)}) = -G_{7,0}^{(3)} - G_{7,0}^{(5)}$$
$$D(G_{8,3}^{(95)}) = -G_{7,0}^{(79)} - G_{7,0}^{(82)}$$
$$D(G_{8,3}^{(96)}) = -G_{7,0}^{(55)} - G_{7,0}^{(58)}$$
$$D(G_{8,3}^{(97)}) = -G_{7,0}^{(102)}$$
$$D(G_{8,3}^{(98)}) = -G_{7,0}^{(1)} - G_{7,0}^{(4)}$$
$$D(G_{8,3}^{(99)}) = -G_{7,0}^{(102)}$$
$$D(G_{8,3}^{(100)}) = -G_{7,0}^{(1)} - G_{7,0}^{(4)}$$
$$D(G_{8,3}^{(101)}) = -G_{7,0}^{(55)} - G_{7,0}^{(58)}$$
$$D(G_{8,3}^{(102)}) = -G_{7,0}^{(54)} - G_{7,0}^{(56)}$$
$$D(G_{8,3}^{(103)}) = -G_{7,0}^{(78)} - G_{7,0}^{(80)}$$
$$D(G_{8,3}^{(104)}) = -G_{7,0}^{(0)} - G_{7,0}^{(2)}$$
$$D(G_{8,3}^{(105)}) = -G_{7,0}^{(78)} - G_{7,0}^{(80)}$$
$$D(G_{8,3}^{(106)}) = -G_{7,0}^{(0)} - G_{7,0}^{(2)}$$
$$D(G_{8,3}^{(107)}) = -G_{7,0}^{(54)} - G_{7,0}^{(56)}$$
$$D(G_{8,3}^{(108)}) = -G_{7,0}^{(87)} - G_{7,0}^{(89)}$$
$$D(G_{8,3}^{(110)}) = -G_{7,0}^{(33)} - G_{7,0}^{(35)}$$
$$D(G_{8,3}^{(112)}) = -G_{7,0}^{(33)} - G_{7,0}^{(35)}$$
$$D(G_{8,3}^{(113)}) = -G_{7,0}^{(87)} - G_{7,0}^{(89)}$$
$$D(G_{8,3}^{(114)}) = -G_{7,0}^{(85)} - G_{7,0}^{(88)}$$
$$D(G_{8,3}^{(116)}) = -G_{7,0}^{(9)} - G_{7,0}^{(11)}$$
$$D(G_{8,3}^{(118)}) = -G_{7,0}^{(9)} - G_{7,0}^{(11)}$$
$$D(G_{8,3}^{(119)}) = -G_{7,0}^{(85)} - G_{7,0}^{(88)}$$

The Fatgraph $G_{8,4}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([0, 2, 3, 5]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^1c^2 \to {}^0d^1 \to {}^2c^0 \to {}^0b^1 \to {}^1b^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^2d^0 \to {}^3b^0 \to {}^1e^2 \to {}^1d^2 \to {}^2e^0)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

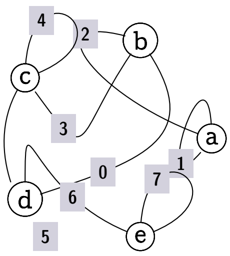
Fatgraph $G_{8,4}$ only has the identity automorphism, so the marked fatgraphs $G_{8,4}^{(0)}$ to $G_{8,4}^{(120)}$ are formed by decorating boundary cycles of $G_{8,4}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$D(G_{8,4}^{(0)}) = -G_{7,0}^{(31)} - G_{7,0}^{(34)}$
$D(G_{8,4}^{(2)}) = -G_{7,0}^{(7)} - G_{7,0}^{(10)}$
$D(G_{8,4}^{(4)}) = -G_{7,0}^{(7)} - G_{7,0}^{(10)}$
$D(G_{8,4}^{(5)}) = -G_{7,0}^{(31)} - G_{7,0}^{(34)}$
$D(G_{8,4}^{(6)}) = -G_{7,0}^{(30)} - G_{7,0}^{(32)}$
$D(G_{8,4}^{(7)}) = -G_{7,0}^{(84)} - G_{7,0}^{(86)}$
$D(G_{8,4}^{(8)}) = -G_{7,0}^{(6)} - G_{7,0}^{(8)}$
$D(G_{8,4}^{(9)}) = -G_{7,0}^{(84)} - G_{7,0}^{(86)}$
$D(G_{8,4}^{(10)}) = -G_{7,0}^{(6)} - G_{7,0}^{(8)}$
$D(G_{8,4}^{(11)}) = -G_{7,0}^{(30)} - G_{7,0}^{(32)}$
$D(G_{8,4}^{(12)}) = -G_{7,0}^{(63)} - G_{7,0}^{(65)}$
$D(G_{8,4}^{(14)}) = -G_{7,0}^{(39)} - G_{7,0}^{(41)}$
$D(G_{8,4}^{(16)}) = -G_{7,0}^{(39)} - G_{7,0}^{(41)}$
$D(G_{8,4}^{(17)}) = -G_{7,0}^{(63)} - G_{7,0}^{(65)}$
$D(G_{8,4}^{(18)}) = -G_{7,0}^{(61)} - G_{7,0}^{(64)}$
$D(G_{8,4}^{(20)}) = -G_{7,0}^{(15)} - G_{7,0}^{(17)}$
$D(G_{8,4}^{(22)}) = -G_{7,0}^{(15)} - G_{7,0}^{(17)}$
$D(G_{8,4}^{(23)}) = -G_{7,0}^{(61)} - G_{7,0}^{(64)}$
$D(G_{8,4}^{(24)}) = -G_{7,0}^{(37)} - G_{7,0}^{(40)}$
$D(G_{8,4}^{(26)}) = -G_{7,0}^{(13)} - G_{7,0}^{(16)}$
$D(G_{8,4}^{(28)}) = -G_{7,0}^{(13)} - G_{7,0}^{(16)}$
$D(G_{8,4}^{(29)}) = -G_{7,0}^{(37)} - G_{7,0}^{(40)}$
$D(G_{8,4}^{(30)}) = -G_{7,0}^{(36)} - G_{7,0}^{(38)}$
$D(G_{8,4}^{(31)}) = -G_{7,0}^{(60)} - G_{7,0}^{(62)}$
$D(G_{8,4}^{(32)}) = -G_{7,0}^{(12)} - G_{7,0}^{(14)}$
$D(G_{8,4}^{(33)}) = -G_{7,0}^{(60)} - G_{7,0}^{(62)}$
$D(G_{8,4}^{(34)}) = -G_{7,0}^{(12)} - G_{7,0}^{(14)}$
$D(G_{8,4}^{(35)}) = -G_{7,0}^{(36)} - G_{7,0}^{(38)}$
$D(G_{8,4}^{(36)}) = -G_{7,0}^{(69)} - G_{7,0}^{(71)}$
$D(G_{8,4}^{(37)}) = -G_{7,0}^{(93)} - G_{7,0}^{(95)}$
$D(G_{8,4}^{(38)}) = -G_{7,0}^{(45)} - G_{7,0}^{(47)}$
$D(G_{8,4}^{(39)}) = -G_{7,0}^{(93)} - G_{7,0}^{(95)}$
$D(G_{8,4}^{(40)}) = -G_{7,0}^{(45)} - G_{7,0}^{(47)}$
$D(G_{8,4}^{(41)}) = -G_{7,0}^{(69)} - G_{7,0}^{(71)}$
$D(G_{8,4}^{(42)}) = -G_{7,0}^{(67)} - G_{7,0}^{(70)}$
$D(G_{8,4}^{(43)}) = -G_{7,0}^{(91)} - G_{7,0}^{(94)}$
$D(G_{8,4}^{(44)}) = -G_{7,0}^{(21)} - G_{7,0}^{(23)}$
$D(G_{8,4}^{(45)}) = -G_{7,0}^{(91)} - G_{7,0}^{(94)}$
$D(G_{8,4}^{(46)}) = -G_{7,0}^{(21)} - G_{7,0}^{(23)}$
$D(G_{8,4}^{(47)}) = -G_{7,0}^{(67)} - G_{7,0}^{(70)}$
$D(G_{8,4}^{(48)}) = -G_{7,0}^{(43)} - G_{7,0}^{(46)}$
$D(G_{8,4}^{(49)}) = -G_{7,0}^{(90)} - G_{7,0}^{(92)}$
$D(G_{8,4}^{(50)}) = -G_{7,0}^{(19)} - G_{7,0}^{(22)}$
$D(G_{8,4}^{(51)}) = -G_{7,0}^{(90)} - G_{7,0}^{(92)}$

$$D(G_{8,4}^{(52)}) = -G_{7,0}^{(19)} - G_{7,0}^{(22)}$$
$$D(G_{8,4}^{(53)}) = -G_{7,0}^{(43)} - G_{7,0}^{(46)}$$
$$D(G_{8,4}^{(54)}) = -G_{7,0}^{(42)} - G_{7,0}^{(44)}$$
$$D(G_{8,4}^{(55)}) = -G_{7,0}^{(66)} - G_{7,0}^{(68)}$$
$$D(G_{8,4}^{(56)}) = -G_{7,0}^{(18)} - G_{7,0}^{(20)}$$
$$D(G_{8,4}^{(57)}) = -G_{7,0}^{(66)} - G_{7,0}^{(68)}$$
$$D(G_{8,4}^{(58)}) = -G_{7,0}^{(18)} - G_{7,0}^{(20)}$$
$$D(G_{8,4}^{(59)}) = -G_{7,0}^{(42)} - G_{7,0}^{(44)}$$

The Fatgraph $G_{8,5}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([5, 3, 4, 4]),# c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

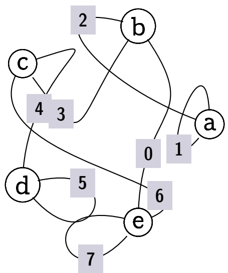
Boundary cycles

$$\alpha = ({}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^3c^0 \to {}^0d^1 \to {}^2b^0)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^2d^0 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2 \to {}^1d^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,5}$ only has the identity automorphism, so the marked fatgraphs $G_{8,5}^{(0)}$ to $G_{8,5}^{(120)}$ are formed by decorating boundary cycles of $G_{8,5}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,6}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([6, 3, 4]),   # c
  Vertex([5, 5, 4]),   # d
  Vertex([6, 0, 7, 7]),# e
])
```

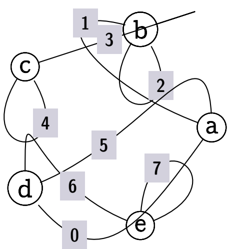
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0e^1 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^3e^0 \to {}^1e^2 \to {}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^2e^3)$$

Markings

Fatgraph $G_{8,6}$ only has the identity automorphism, so the marked fatgraphs $G_{8,6}^{(0)}$ to $G_{8,6}^{(120)}$ are formed by decorating boundary cycles of $G_{8,6}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,7}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0]),   # a
  Vertex([1, 2, 2, 3]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

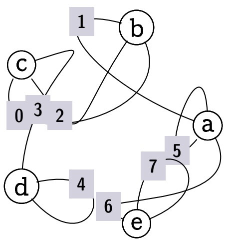
Boundary cycles

$$\alpha = ({}^1a^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^1c^2 \to {}^0d^1 \to {}^2c^0 \to {}^0b^1)$$
$$\beta = ({}^2d^0 \to {}^2a^0 \to {}^1e^2 \to {}^1d^2 \to {}^2e^0)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,7}$ only has the identity automorphism, so the marked fatgraphs $G_{8,7}^{(0)}$ to $G_{8,7}^{(120)}$ are formed by decorating boundary cycles of $G_{8,7}$ with all permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,8}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 5, 6]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([0, 2, 3]),   # c
  Vertex([4, 4, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

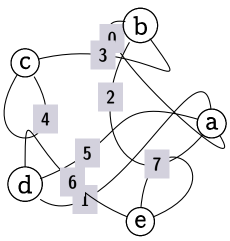
$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^3 \to {}^3a^0 \to {}^1e^2 \to {}^2e^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,8}$ only has the identity automorphism, so the marked fatgraphs $G_{8,8}^{(0)}$ to $G_{8,8}^{(120)}$ are formed by decorating boundary cycles of $G_{8,8}$ with all permutations

of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,9}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 5, 2, 0]),# a
  Vertex([0, 2, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

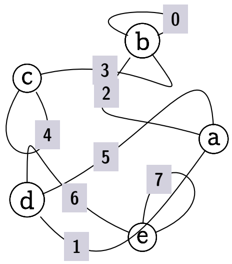
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1e^2 \to {}^0a^1 \to {}^1d^2 \to {}^2e^0)$$
$$\beta = ({}^1a^2 \to {}^2c^0 \to {}^3a^0 \to {}^1c^2 \to {}^0d^1 \to {}^2b^0 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,9}$ only has the identity automorphism, so the marked fatgraphs $G_{8,9}^{(0)}$ to $G_{8,9}^{(120)}$ are formed by decorating boundary cycles of $G_{8,9}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,10}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([0, 2, 3, 0]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

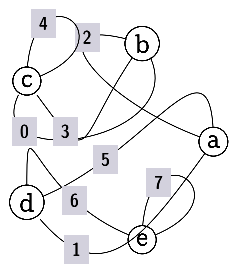
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{0}d^{1} \to {}^{2}b^{3} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{2}a^{0} \to {}^{1}e^{2} \to {}^{1}d^{2} \to {}^{2}e^{0})$$
$$\gamma = ({}^{3}b^{0})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,10}$ only has the identity automorphism, so the marked fatgraphs $G_{8,10}^{(0)}$ to $G_{8,10}^{(120)}$ are formed by decorating boundary cycles of $G_{8,10}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,11}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

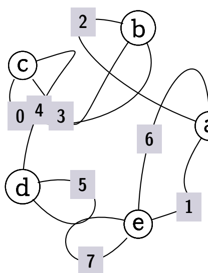
Boundary cycles

$$\alpha = ({}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^3c^0 \to {}^0d^1 \to {}^2b^0)$$
$$\beta = ({}^2d^0 \to {}^2a^0 \to {}^1e^2 \to {}^1d^2 \to {}^2e^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,11}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,11}$ to $G^{(120)}_{8,11}$ are formed by decorating boundary cycles of $G_{8,11}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,12}$ (120 orientable markings)




```
Fatgraph([
  Vertex([6, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([5, 5, 4]),   # d
  Vertex([1, 6, 7, 7]),# e
])
```

Boundary cycles

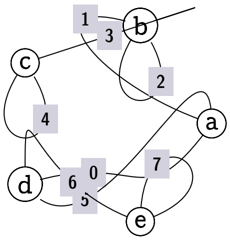
$$\alpha = ({}^2d^0 \to {}^0e^1 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0 \to {}^3e^0 \to {}^1e^2)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^2e^3)$$

Markings

Fatgraph $G_{8,12}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,12}$ to $G^{(120)}_{8,12}$ are formed by decorating boundary cycles of $G_{8,12}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,13}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0]),   # a
  Vertex([1, 2, 2, 3]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

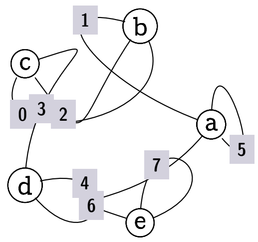
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^1e^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^2e^0 \to {}^1c^2 \to {}^2c^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0 \to {}^0d^1)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,13}$ only has the identity automorphism, so the marked fatgraphs $G_{8,13}^{(0)}$ to $G_{8,13}^{(120)}$ are formed by decorating boundary cycles of $G_{8,13}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,14}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 6, 5]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([0, 2, 3]),   # c
  Vertex([4, 4, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

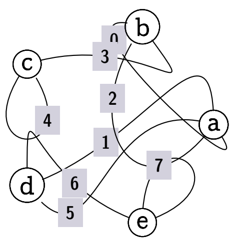
Boundary cycles

$\alpha = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}c^{0} \to {}^{2}a^{3} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{0}b^{1} \to {}^{1}e^{2} \to {}^{1}d^{2})$
$\beta = ({}^{3}a^{0})$
$\gamma = ({}^{0}c^{1} \to {}^{1}b^{2})$
$\delta = ({}^{0}d^{1})$
$\epsilon = ({}^{0}e^{1})$

Markings

Fatgraph $G_{8,14}$ only has the identity automorphism, so the marked fatgraphs $G_{8,14}^{(0)}$ to $G_{8,14}^{(120)}$ are formed by decorating boundary cycles of $G_{8,14}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,15}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 5, 2, 0]),# a
  Vertex([0, 2, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([5, 1, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^0d^1 \to {}^0a^1)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^2c^0 \to {}^3a^0 \to {}^2e^0 \to {}^1c^2 \to {}^2b^0 \to {}^1b^2 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
$A_1{}^\ddagger$	a	d	e	b	c	5	2	1	6	7	0	3	4	γ	β	α	ϵ	δ

Markings

	$G^{(0)}_{8,15}$	$G^{(1)}_{8,15}$	$G^{(2)}_{8,15}$	$G^{(3)}_{8,15}$	$G^{(4)}_{8,15}$	$G^{(5)}_{8,15}$	$G^{(6)}_{8,15}$	$G^{(7)}_{8,15}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{8,15}$	$G^{(9)}_{8,15}$	$G^{(10)}_{8,15}$	$G^{(11)}_{8,15}$	$G^{(12)}_{8,15}$	$G^{(13)}_{8,15}$	$G^{(14)}_{8,15}$	$G^{(15)}_{8,15}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}_{8,15}$	$G^{(17)}_{8,15}$	$G^{(18)}_{8,15}$	$G^{(19)}_{8,15}$	$G^{(20)}_{8,15}$	$G^{(21)}_{8,15}$	$G^{(22)}_{8,15}$	$G^{(23)}_{8,15}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{8,15}$	$G^{(25)}_{8,15}$	$G^{(26)}_{8,15}$	$G^{(27)}_{8,15}$	$G^{(28)}_{8,15}$	$G^{(29)}_{8,15}$	$G^{(30)}_{8,15}$	$G^{(31)}_{8,15}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0

(continued.)

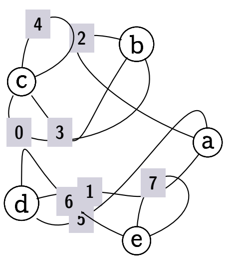
	$G_{8,15}^{(32)}$	$G_{8,15}^{(33)}$	$G_{8,15}^{(34)}$	$G_{8,15}^{(35)}$	$G_{8,15}^{(36)}$	$G_{8,15}^{(37)}$	$G_{8,15}^{(38)}$	$G_{8,15}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0

	$G_{8,15}^{(40)}$	$G_{8,15}^{(41)}$	$G_{8,15}^{(42)}$	$G_{8,15}^{(43)}$	$G_{8,15}^{(44)}$	$G_{8,15}^{(45)}$	$G_{8,15}^{(46)}$	$G_{8,15}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0

	$G_{8,15}^{(48)}$	$G_{8,15}^{(49)}$	$G_{8,15}^{(50)}$	$G_{8,15}^{(51)}$	$G_{8,15}^{(52)}$	$G_{8,15}^{(53)}$	$G_{8,15}^{(54)}$	$G_{8,15}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1

	$G_{8,15}^{(56)}$	$G_{8,15}^{(57)}$	$G_{8,15}^{(58)}$	$G_{8,15}^{(59)}$
α	3	3	3	3
β	1	1	2	2
γ	4	4	4	4
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{8,16}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([5, 1, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

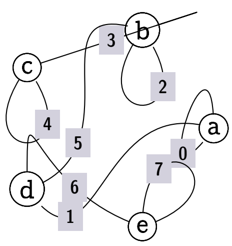
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1c^2 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^2e^0 \to {}^3c^0 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^2a^0 \to {}^0d^1)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,16}$ only has the identity automorphism, so the marked fatgraphs $G_{8,16}^{(0)}$ to $G_{8,16}^{(120)}$ are formed by decorating boundary cycles of $G_{8,16}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,17}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),   # a
  Vertex([5, 2, 2, 3]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

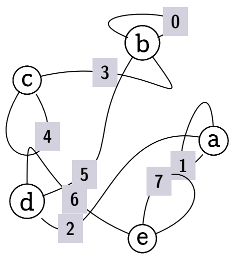
$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^1e^2 \to {}^0a^1 \to {}^2b^3 \to {}^3b^0 \to {}^2e^0 \to {}^1c^2 \to {}^0d^1 \to {}^2c^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,17}$ only has the identity automorphism, so the marked fatgraphs $G_{8,17}^{(0)}$ to $G_{8,17}^{(120)}$ are formed by decorating boundary cycles of $G_{8,17}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,18}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([0, 5, 3, 0]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([2, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

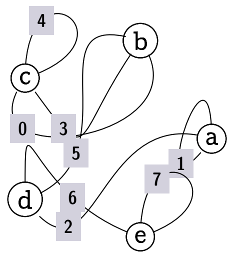
Boundary cycles

$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^1e^2 \to {}^0a^1 \to {}^2b^3 \to {}^2e^0 \to {}^1c^2 \to {}^0d^1 \to {}^2c^0 \to {}^0b^1 \to {}^1d^2 \to {}^1b^2)$
$\beta = ({}^2a^0)$
$\gamma = ({}^3b^0)$
$\delta = ({}^0c^1)$
$\epsilon = ({}^0e^1)$

Markings

Fatgraph $G_{8,18}$ only has the identity automorphism, so the marked fatgraphs $G_{8,18}^{(0)}$ to $G_{8,18}^{(120)}$ are formed by decorating boundary cycles of $G_{8,18}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,19}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([5, 3, 0]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([2, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

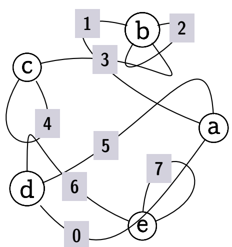
Boundary cycles

$\alpha = ({}^{2}d^{0} \to {}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{3}c^{0} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$
$\beta = ({}^{2}a^{0})$
$\gamma = ({}^{0}c^{1} \to {}^{1}b^{2})$
$\delta = ({}^{2}c^{3})$
$\epsilon = ({}^{0}e^{1})$

Markings

Fatgraph $G_{8,19}$ only has the identity automorphism, so the marked fatgraphs $G_{8,19}^{(0)}$ to $G_{8,19}^{(120)}$ are formed by decorating boundary cycles of $G_{8,19}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,20}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 1, 0]),   # a
  Vertex([1, 2, 3, 2]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

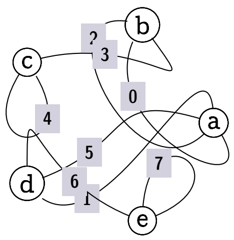
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}d^{1} \to {}^{3}b^{0} \to {}^{0}a^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{2}d^{0} \to {}^{2}a^{0} \to {}^{1}e^{2} \to {}^{1}d^{2} \to {}^{2}e^{0})$$
$$\gamma = ({}^{2}b^{3} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,20}$ only has the identity automorphism, so the marked fatgraphs $G_{8,20}^{(0)}$ to $G_{8,20}^{(120)}$ are formed by decorating boundary cycles of $G_{8,20}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,21}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 5, 2, 0]),# a
  Vertex([2, 0, 3]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{1}e^{2} \to {}^{0}a^{1} \to {}^{1}d^{2} \to {}^{2}e^{0})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}a^{0} \to {}^{0}d^{1} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{3} \to {}^{2}b^{0} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
A_1 ‡	a	d	e	b	c	5	2	1	6	7	0	3	4	γ	β	α	ϵ	δ

Markings

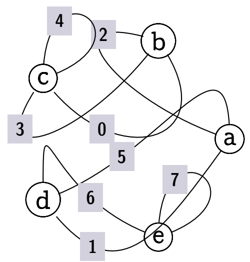
	$G_{8,21}^{(0)}$	$G_{8,21}^{(1)}$	$G_{8,21}^{(2)}$	$G_{8,21}^{(3)}$	$G_{8,21}^{(4)}$	$G_{8,21}^{(5)}$	$G_{8,21}^{(6)}$	$G_{8,21}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{8,21}^{(8)}$	$G_{8,21}^{(9)}$	$G_{8,21}^{(10)}$	$G_{8,21}^{(11)}$	$G_{8,21}^{(12)}$	$G_{8,21}^{(13)}$	$G_{8,21}^{(14)}$	$G_{8,21}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{8,21}^{(16)}$	$G_{8,21}^{(17)}$	$G_{8,21}^{(18)}$	$G_{8,21}^{(19)}$	$G_{8,21}^{(20)}$	$G_{8,21}^{(21)}$	$G_{8,21}^{(22)}$	$G_{8,21}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{8,21}^{(24)}$	$G_{8,21}^{(25)}$	$G_{8,21}^{(26)}$	$G_{8,21}^{(27)}$	$G_{8,21}^{(28)}$	$G_{8,21}^{(29)}$	$G_{8,21}^{(30)}$	$G_{8,21}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G_{8,21}^{(32)}$	$G_{8,21}^{(33)}$	$G_{8,21}^{(34)}$	$G_{8,21}^{(35)}$	$G_{8,21}^{(36)}$	$G_{8,21}^{(37)}$	$G_{8,21}^{(38)}$	$G_{8,21}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{8,21}^{(40)}$	$G_{8,21}^{(41)}$	$G_{8,21}^{(42)}$	$G_{8,21}^{(43)}$	$G_{8,21}^{(44)}$	$G_{8,21}^{(45)}$	$G_{8,21}^{(46)}$	$G_{8,21}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{8,21}^{(48)}$	$G_{8,21}^{(49)}$	$G_{8,21}^{(50)}$	$G_{8,21}^{(51)}$	$G_{8,21}^{(52)}$	$G_{8,21}^{(53)}$	$G_{8,21}^{(54)}$	$G_{8,21}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4

(continued.)

δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1

	$G_{8,21}^{(56)}$	$G_{8,21}^{(57)}$	$G_{8,21}^{(58)}$	$G_{8,21}^{(59)}$
α	3	3	3	3
β	1	1	2	2
γ	4	4	4	4
δ	0	2	0	1
ϵ	2	0	1	0

The Fatgraph $G_{8,22}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([3, 0, 4, 4]),# c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

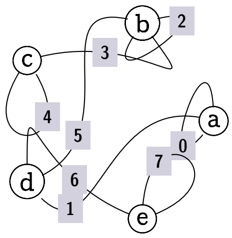
Boundary cycles

$$\alpha = ({}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{0}c^{1} \to {}^{0}d^{1} \to {}^{2}b^{0})$$
$$\beta = ({}^{2}d^{0} \to {}^{2}a^{0} \to {}^{1}e^{2} \to {}^{1}d^{2} \to {}^{2}e^{0})$$
$$\gamma = ({}^{3}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,22}$ only has the identity automorphism, so the marked fatgraphs $G_{8,22}^{(0)}$ to $G_{8,22}^{(120)}$ are formed by decorating boundary cycles of $G_{8,22}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section “Markings of fatgraphs with trivial automorphisms” for a complete table.

The Fatgraph $G_{8,23}$ (120 orientable markings)




```
Fatgraph([
  Vertex([0, 1, 0]),   # a
  Vertex([5, 2, 3, 2]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^3b^0 \to {}^2e^0 \to {}^0d^1 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^2b^3 \to {}^2c^0 \to {}^1c^2 \to {}^1b^2)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

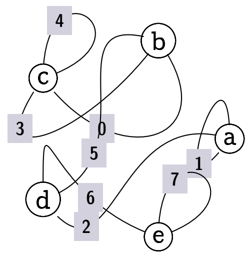
Markings

Fatgraph $G_{8,23}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,23}$ to $G^{(120)}_{8,23}$ are formed by decorating boundary cycles of $G_{8,23}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G^{(100)}_{8,23}) = +G^{(72)}_{7,0}$$
$$D(G^{(101)}_{8,23}) = +G^{(96)}_{7,0}$$
$$D(G^{(102)}_{8,23}) = +G^{(48)}_{7,0}$$
$$D(G^{(103)}_{8,23}) = +G^{(97)}_{7,0}$$
$$D(G^{(104)}_{8,23}) = +G^{(49)}_{7,0}$$
$$D(G^{(105)}_{8,23}) = +G^{(73)}_{7,0}$$
$$D(G^{(106)}_{8,23}) = +G^{(74)}_{7,0}$$
$$D(G^{(107)}_{8,23}) = +G^{(98)}_{7,0}$$
$$D(G^{(108)}_{8,23}) = +G^{(24)}_{7,0}$$
$$D(G^{(109)}_{8,23}) = +G^{(99)}_{7,0}$$
$$D(G^{(110)}_{8,23}) = +G^{(25)}_{7,0}$$
$$D(G^{(111)}_{8,23}) = +G^{(75)}_{7,0}$$
$$D(G^{(112)}_{8,23}) = +G^{(50)}_{7,0}$$
$$D(G^{(113)}_{8,23}) = +G^{(100)}_{7,0}$$
$$D(G^{(114)}_{8,23}) = +G^{(26)}_{7,0}$$
$$D(G^{(115)}_{8,23}) = +G^{(101)}_{7,0}$$
$$D(G^{(116)}_{8,23}) = +G^{(27)}_{7,0}$$
$$D(G^{(117)}_{8,23}) = +G^{(51)}_{7,0}$$
$$D(G^{(118)}_{8,23}) = +G^{(52)}_{7,0}$$
$$D(G^{(119)}_{8,23}) = +G^{(76)}_{7,0}$$

The Fatgraph $G_{8,24}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([5, 3, 0]),   # b
  Vertex([3, 0, 4, 4]),# c
  Vertex([2, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\beta = ({}^{2}a^{0})$$
$$\gamma = ({}^{3}c^{0} \to {}^{1}c^{2} \to {}^{1}b^{2})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

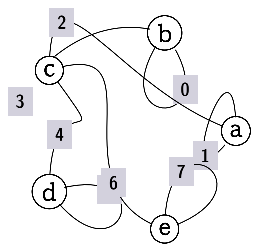
Fatgraph $G_{8,24}$ only has the identity automorphism, so the marked fatgraphs $G_{8,24}^{(0)}$ to $G_{8,24}^{(120)}$ are formed by decorating boundary cycles of $G_{8,24}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{8,24}^{(0)}) = +G_{7,0}^{(28)}$$
$$D(G_{8,24}^{(1)}) = +G_{7,0}^{(77)}$$
$$D(G_{8,24}^{(2)}) = +G_{7,0}^{(29)}$$
$$D(G_{8,24}^{(3)}) = +G_{7,0}^{(53)}$$
$$D(G_{8,24}^{(4)}) = +G_{7,0}^{(78)}$$
$$D(G_{8,24}^{(5)}) = +G_{7,0}^{(102)}$$
$$D(G_{8,24}^{(6)}) = +G_{7,0}^{(54)}$$
$$D(G_{8,24}^{(8)}) = +G_{7,0}^{(55)}$$
$$D(G_{8,24}^{(9)}) = +G_{7,0}^{(79)}$$
$$D(G_{8,24}^{(10)}) = +G_{7,0}^{(80)}$$
$$D(G_{8,24}^{(12)}) = +G_{7,0}^{(0)}$$
$$D(G_{8,24}^{(14)}) = +G_{7,0}^{(1)}$$
$$D(G_{8,24}^{(15)}) = +G_{7,0}^{(81)}$$
$$D(G_{8,24}^{(16)}) = +G_{7,0}^{(56)}$$
$$D(G_{8,24}^{(18)}) = +G_{7,0}^{(2)}$$
$$D(G_{8,24}^{(20)}) = +G_{7,0}^{(3)}$$
$$D(G_{8,24}^{(21)}) = +G_{7,0}^{(57)}$$
$$D(G_{8,24}^{(22)}) = +G_{7,0}^{(58)}$$
$$D(G_{8,24}^{(23)}) = +G_{7,0}^{(82)}$$
$$D(G_{8,24}^{(24)}) = +G_{7,0}^{(4)}$$
$$D(G_{8,24}^{(25)}) = +G_{7,0}^{(83)}$$
$$D(G_{8,24}^{(26)}) = +G_{7,0}^{(5)}$$
$$D(G_{8,24}^{(27)}) = +G_{7,0}^{(59)}$$
$$D(G_{8,24}^{(28)}) = +G_{7,0}^{(84)}$$

$D(G_{8,24}^{(30)}) = +G_{7,0}^{(30)}$
$D(G_{8,24}^{(32)}) = +G_{7,0}^{(31)}$
$D(G_{8,24}^{(33)}) = +G_{7,0}^{(85)}$
$D(G_{8,24}^{(34)}) = +G_{7,0}^{(86)}$
$D(G_{8,24}^{(36)}) = +G_{7,0}^{(6)}$
$D(G_{8,24}^{(38)}) = +G_{7,0}^{(7)}$
$D(G_{8,24}^{(39)}) = +G_{7,0}^{(87)}$
$D(G_{8,24}^{(40)}) = +G_{7,0}^{(32)}$
$D(G_{8,24}^{(42)}) = +G_{7,0}^{(8)}$
$D(G_{8,24}^{(44)}) = +G_{7,0}^{(9)}$
$D(G_{8,24}^{(45)}) = +G_{7,0}^{(33)}$
$D(G_{8,24}^{(46)}) = +G_{7,0}^{(34)}$
$D(G_{8,24}^{(47)}) = +G_{7,0}^{(88)}$
$D(G_{8,24}^{(48)}) = +G_{7,0}^{(10)}$
$D(G_{8,24}^{(49)}) = +G_{7,0}^{(89)}$
$D(G_{8,24}^{(50)}) = +G_{7,0}^{(11)}$
$D(G_{8,24}^{(51)}) = +G_{7,0}^{(35)}$
$D(G_{8,24}^{(52)}) = +G_{7,0}^{(60)}$
$D(G_{8,24}^{(54)}) = +G_{7,0}^{(36)}$
$D(G_{8,24}^{(56)}) = +G_{7,0}^{(37)}$
$D(G_{8,24}^{(57)}) = +G_{7,0}^{(61)}$
$D(G_{8,24}^{(58)}) = +G_{7,0}^{(62)}$
$D(G_{8,24}^{(60)}) = +G_{7,0}^{(12)}$
$D(G_{8,24}^{(62)}) = +G_{7,0}^{(13)}$
$D(G_{8,24}^{(63)}) = +G_{7,0}^{(63)}$
$D(G_{8,24}^{(64)}) = +G_{7,0}^{(38)}$
$D(G_{8,24}^{(66)}) = +G_{7,0}^{(14)}$
$D(G_{8,24}^{(68)}) = +G_{7,0}^{(15)}$
$D(G_{8,24}^{(69)}) = +G_{7,0}^{(39)}$
$D(G_{8,24}^{(70)}) = +G_{7,0}^{(40)}$
$D(G_{8,24}^{(71)}) = +G_{7,0}^{(64)}$
$D(G_{8,24}^{(72)}) = +G_{7,0}^{(16)}$
$D(G_{8,24}^{(73)}) = +G_{7,0}^{(65)}$
$D(G_{8,24}^{(74)}) = +G_{7,0}^{(17)}$
$D(G_{8,24}^{(75)}) = +G_{7,0}^{(41)}$
$D(G_{8,24}^{(76)}) = +G_{7,0}^{(66)}$
$D(G_{8,24}^{(77)}) = +G_{7,0}^{(90)}$
$D(G_{8,24}^{(78)}) = +G_{7,0}^{(42)}$
$D(G_{8,24}^{(79)}) = +G_{7,0}^{(91)}$
$D(G_{8,24}^{(80)}) = +G_{7,0}^{(43)}$
$D(G_{8,24}^{(81)}) = +G_{7,0}^{(67)}$
$D(G_{8,24}^{(82)}) = +G_{7,0}^{(68)}$
$D(G_{8,24}^{(83)}) = +G_{7,0}^{(92)}$
$D(G_{8,24}^{(84)}) = +G_{7,0}^{(18)}$
$D(G_{8,24}^{(85)}) = +G_{7,0}^{(93)}$
$D(G_{8,24}^{(86)}) = +G_{7,0}^{(19)}$
$D(G_{8,24}^{(87)}) = +G_{7,0}^{(69)}$
$D(G_{8,24}^{(88)}) = +G_{7,0}^{(44)}$
$D(G_{8,24}^{(89)}) = +G_{7,0}^{(94)}$
$D(G_{8,24}^{(90)}) = +G_{7,0}^{(20)}$
$D(G_{8,24}^{(91)}) = +G_{7,0}^{(95)}$
$D(G_{8,24}^{(92)}) = +G_{7,0}^{(21)}$
$D(G_{8,24}^{(93)}) = +G_{7,0}^{(45)}$
$D(G_{8,24}^{(94)}) = +G_{7,0}^{(46)}$
$D(G_{8,24}^{(95)}) = +G_{7,0}^{(70)}$
$D(G_{8,24}^{(96)}) = +G_{7,0}^{(22)}$
$D(G_{8,24}^{(97)}) = +G_{7,0}^{(71)}$
$D(G_{8,24}^{(98)}) = +G_{7,0}^{(23)}$
$D(G_{8,24}^{(99)}) = +G_{7,0}^{(47)}$
$D(G_{8,24}^{(100)}) = -G_{7,0}^{(80)}$
$D(G_{8,24}^{(102)}) = -G_{7,0}^{(56)}$
$D(G_{8,24}^{(104)}) = -G_{7,0}^{(58)}$
$D(G_{8,24}^{(105)}) = -G_{7,0}^{(82)}$
$D(G_{8,24}^{(106)}) = -G_{7,0}^{(86)}$
$D(G_{8,24}^{(108)}) = -G_{7,0}^{(32)}$
$D(G_{8,24}^{(110)}) = -G_{7,0}^{(34)}$
$D(G_{8,24}^{(111)}) = -G_{7,0}^{(88)}$
$D(G_{8,24}^{(112)}) = -G_{7,0}^{(62)}$
$D(G_{8,24}^{(114)}) = -G_{7,0}^{(38)}$
$D(G_{8,24}^{(116)}) = -G_{7,0}^{(40)}$
$D(G_{8,24}^{(117)}) = -G_{7,0}^{(64)}$
$D(G_{8,24}^{(118)}) = -G_{7,0}^{(68)}$
$D(G_{8,24}^{(119)}) = -G_{7,0}^{(92)}$

The Fatgraph $G_{8,25}$ (30 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),   # a
  Vertex([3, 0, 0]),   # b
  Vertex([3, 4, 6, 2]),# c
  Vertex([5, 5, 4]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$\alpha = ({}^2d^0 \to {}^3c^0 \to {}^1c^2 \to {}^0a^1 \to {}^0b^1 \to {}^1a^2 \to {}^2e^0 \to {}^0c^1 \to {}^2c^3 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$
$\beta = ({}^2a^0)$
$\gamma = ({}^1b^2)$
$\delta = ({}^0d^1)$
$\epsilon = ({}^0e^1)$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
$A_1{}^\ddagger$	b	d	c	e	a	5	0	3	4	6	7	2	1	α	γ	δ	ϵ	β
$A_2{}^\ddagger$	d	e	c	a	b	7	5	4	6	2	1	3	0	α	δ	ϵ	β	γ
$A_3{}^\ddagger$	e	a	c	b	d	1	7	6	2	3	0	4	5	α	ϵ	β	γ	δ

Markings

	$G^{(0)}_{8,25}$	$G^{(1)}_{8,25}$	$G^{(2)}_{8,25}$	$G^{(3)}_{8,25}$	$G^{(4)}_{8,25}$	$G^{(5)}_{8,25}$	$G^{(6)}_{8,25}$	$G^{(7)}_{8,25}$
α	0	0	0	0	0	0	1	1
β	1	1	1	1	1	1	0	0
γ	2	2	3	3	4	4	2	2
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{8,25}$	$G^{(9)}_{8,25}$	$G^{(10)}_{8,25}$	$G^{(11)}_{8,25}$	$G^{(12)}_{8,25}$	$G^{(13)}_{8,25}$	$G^{(14)}_{8,25}$	$G^{(15)}_{8,25}$
α	1	1	1	1	2	2	2	2
β	0	0	0	0	0	0	0	0
γ	3	3	4	4	1	1	3	3

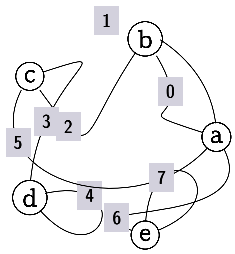
(continued.)

δ	2	4	2	3	3	4	1	4
ϵ	4	2	3	2	4	3	4	1
	$G_{8,25}^{(16)}$	$G_{8,25}^{(17)}$	$G_{8,25}^{(18)}$	$G_{8,25}^{(19)}$	$G_{8,25}^{(20)}$	$G_{8,25}^{(21)}$	$G_{8,25}^{(22)}$	$G_{8,25}^{(23)}$
α	2	2	3	3	3	3	3	3
β	0	0	0	0	0	0	0	0
γ	4	4	1	1	2	2	4	4
δ	1	3	2	4	1	4	1	2
ϵ	3	1	4	2	4	1	2	1
	$G_{8,25}^{(24)}$	$G_{8,25}^{(25)}$	$G_{8,25}^{(26)}$	$G_{8,25}^{(27)}$	$G_{8,25}^{(28)}$	$G_{8,25}^{(29)}$		
α	4	4	4	4	4	4		
β	0	0	0	0	0	0		
γ	1	1	2	2	3	3		
δ	2	3	1	3	1	2		
ϵ	3	2	3	1	2	1		

Differentials

$$D(G_{8,25}^{(0)}) = -G_{7,0}^{(44)}$$
$$D(G_{8,25}^{(1)}) = -G_{7,0}^{(94)}$$
$$D(G_{8,25}^{(2)}) = -G_{7,0}^{(46)}$$
$$D(G_{8,25}^{(3)}) = -G_{7,0}^{(70)}$$
$$D(G_{8,25}^{(4)}) = -G_{7,0}^{(74)}$$
$$D(G_{8,25}^{(5)}) = -G_{7,0}^{(98)}$$
$$D(G_{8,25}^{(6)}) = -G_{7,0}^{(50)}$$
$$D(G_{8,25}^{(7)}) = -G_{7,0}^{(100)}$$
$$D(G_{8,25}^{(8)}) = -G_{7,0}^{(52)}$$
$$D(G_{8,25}^{(9)}) = -G_{7,0}^{(76)}$$
$$D(G_{8,25}^{(10)}) = -G_{7,0}^{(84)}$$
$$D(G_{8,25}^{(12)}) = -G_{7,0}^{(8)}$$
$$D(G_{8,25}^{(14)}) = -G_{7,0}^{(10)}$$
$$D(G_{8,25}^{(15)}) = -G_{7,0}^{(89)}$$
$$D(G_{8,25}^{(16)}) = -G_{7,0}^{(60)}$$
$$D(G_{8,25}^{(18)}) = -G_{7,0}^{(14)}$$
$$D(G_{8,25}^{(20)}) = -G_{7,0}^{(16)}$$
$$D(G_{8,25}^{(21)}) = -G_{7,0}^{(65)}$$
$$D(G_{8,25}^{(22)}) = -G_{7,0}^{(66)}$$
$$D(G_{8,25}^{(23)}) = -G_{7,0}^{(90)}$$
$$D(G_{8,25}^{(24)}) = -G_{7,0}^{(20)}$$
$$D(G_{8,25}^{(25)}) = -G_{7,0}^{(95)}$$
$$D(G_{8,25}^{(26)}) = -G_{7,0}^{(22)}$$
$$D(G_{8,25}^{(27)}) = -G_{7,0}^{(71)}$$
$$D(G_{8,25}^{(28)}) = -G_{7,0}^{(72)}$$
$$D(G_{8,25}^{(29)}) = -G_{7,0}^{(96)}$$

The Fatgraph $G_{8,26}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 6]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 2, 3]),   # c
  Vertex([4, 4, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}a^{0} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,26}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,26}$ to $G^{(120)}_{8,26}$ are formed by decorating boundary cycles of $G_{8,26}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

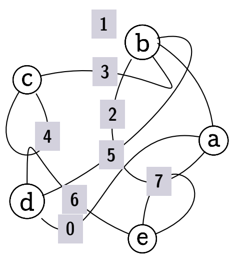
Differentials

$$D(G^{(0)}_{8,26}) = -G^{(26)}_{7,0}$$
$$D(G^{(1)}_{8,26}) = -G^{(101)}_{7,0}$$
$$D(G^{(2)}_{8,26}) = -G^{(28)}_{7,0}$$
$$D(G^{(3)}_{8,26}) = -G^{(77)}_{7,0}$$
$$D(G^{(4)}_{8,26}) = -G^{(78)}_{7,0}$$
$$D(G^{(5)}_{8,26}) = -G^{(102)}_{7,0}$$
$$D(G^{(6)}_{8,26}) = -G^{(2)}_{7,0}$$
$$D(G^{(8)}_{8,26}) = -G^{(4)}_{7,0}$$
$$D(G^{(9)}_{8,26}) = -G^{(83)}_{7,0}$$
$$D(G^{(10)}_{8,26}) = -G^{(36)}_{7,0}$$
$$D(G^{(12)}_{8,26}) = -G^{(12)}_{7,0}$$
$$D(G^{(14)}_{8,26}) = -G^{(17)}_{7,0}$$
$$D(G^{(15)}_{8,26}) = -G^{(41)}_{7,0}$$
$$D(G^{(16)}_{8,26}) = -G^{(42)}_{7,0}$$
$$D(G^{(17)}_{8,26}) = -G^{(91)}_{7,0}$$
$$D(G^{(18)}_{8,26}) = -G^{(18)}_{7,0}$$
$$D(G^{(19)}_{8,26}) = -G^{(93)}_{7,0}$$
$$D(G^{(20)}_{8,26}) = -G^{(23)}_{7,0}$$
$$D(G^{(21)}_{8,26}) = -G^{(47)}_{7,0}$$
$$D(G^{(22)}_{8,26}) = -G^{(48)}_{7,0}$$
$$D(G^{(23)}_{8,26}) = -G^{(97)}_{7,0}$$
$$D(G^{(24)}_{8,26}) = -G^{(24)}_{7,0}$$
$$D(G^{(25)}_{8,26}) = -G^{(99)}_{7,0}$$
$$D(G^{(26)}_{8,26}) = -G^{(29)}_{7,0}$$

$$
\begin{aligned}
D(G^{(27)}_{8,26}) &= -G^{(53)}_{7,0} \\
D(G^{(28)}_{8,26}) &= -G^{(54)}_{7,0} \\
D(G^{(30)}_{8,26}) &= -G^{(0)}_{7,0} \\
D(G^{(32)}_{8,26}) &= -G^{(5)}_{7,0} \\
D(G^{(33)}_{8,26}) &= -G^{(59)}_{7,0} \\
D(G^{(34)}_{8,26}) &= -G^{(30)}_{7,0} \\
D(G^{(36)}_{8,26}) &= -G^{(6)}_{7,0} \\
D(G^{(38)}_{8,26}) &= -G^{(11)}_{7,0} \\
D(G^{(39)}_{8,26}) &= -G^{(35)}_{7,0} \\
D(G^{(40)}_{8,26}) &= -G^{(43)}_{7,0} \\
D(G^{(41)}_{8,26}) &= -G^{(67)}_{7,0} \\
D(G^{(42)}_{8,26}) &= -G^{(19)}_{7,0} \\
D(G^{(43)}_{8,26}) &= -G^{(69)}_{7,0} \\
D(G^{(44)}_{8,26}) &= -G^{(21)}_{7,0} \\
D(G^{(45)}_{8,26}) &= -G^{(45)}_{7,0} \\
D(G^{(46)}_{8,26}) &= -G^{(49)}_{7,0} \\
D(G^{(47)}_{8,26}) &= -G^{(73)}_{7,0} \\
D(G^{(48)}_{8,26}) &= -G^{(25)}_{7,0} \\
D(G^{(49)}_{8,26}) &= -G^{(75)}_{7,0} \\
D(G^{(50)}_{8,26}) &= -G^{(27)}_{7,0}
\end{aligned}
$$

$$
\begin{aligned}
D(G^{(51)}_{8,26}) &= -G^{(51)}_{7,0} \\
D(G^{(52)}_{8,26}) &= -G^{(55)}_{7,0} \\
D(G^{(53)}_{8,26}) &= -G^{(79)}_{7,0} \\
D(G^{(54)}_{8,26}) &= -G^{(1)}_{7,0} \\
D(G^{(55)}_{8,26}) &= -G^{(81)}_{7,0} \\
D(G^{(56)}_{8,26}) &= -G^{(3)}_{7,0} \\
D(G^{(57)}_{8,26}) &= -G^{(57)}_{7,0} \\
D(G^{(58)}_{8,26}) &= -G^{(31)}_{7,0} \\
D(G^{(59)}_{8,26}) &= -G^{(85)}_{7,0} \\
D(G^{(60)}_{8,26}) &= -G^{(7)}_{7,0} \\
D(G^{(61)}_{8,26}) &= -G^{(87)}_{7,0} \\
D(G^{(62)}_{8,26}) &= -G^{(9)}_{7,0} \\
D(G^{(63)}_{8,26}) &= -G^{(33)}_{7,0} \\
D(G^{(64)}_{8,26}) &= -G^{(37)}_{7,0} \\
D(G^{(65)}_{8,26}) &= -G^{(61)}_{7,0} \\
D(G^{(66)}_{8,26}) &= -G^{(13)}_{7,0} \\
D(G^{(67)}_{8,26}) &= -G^{(63)}_{7,0} \\
D(G^{(68)}_{8,26}) &= -G^{(15)}_{7,0} \\
D(G^{(69)}_{8,26}) &= -G^{(39)}_{7,0}
\end{aligned}
$$

The Fatgraph $G_{8,27}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([1, 2, 3, 5]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

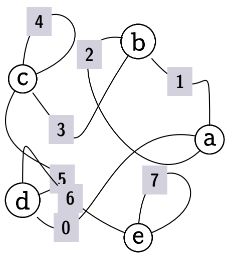
Boundary cycles

$$\alpha = ({}^{0}d^{1} \to {}^{3}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}b^{3} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}b^{1})$$
$$\delta = ({}^{0}c^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,27}$ only has the identity automorphism, so the marked fatgraphs $G_{8,27}^{(0)}$ to $G_{8,27}^{(120)}$ are formed by decorating boundary cycles of $G_{8,27}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,28}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([5, 3, 4, 4]),# c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

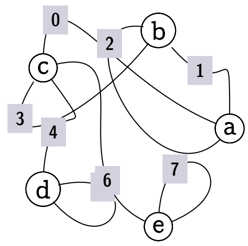
$$\alpha = ({}^{0}d^{1} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{3}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,28}$ only has the identity automorphism, so the marked fatgraphs $G_{8,28}^{(0)}$ to $G_{8,28}^{(120)}$ are formed by decorating boundary cycles of $G_{8,28}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,29}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([3, 4, 6, 0]),# c
  Vertex([5, 5, 4]),   # d
  Vertex([7, 7, 6]),   # e
])
```

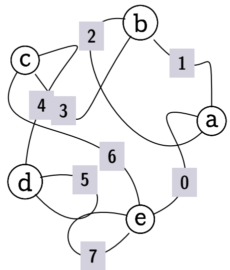
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^3c^0 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^0c^1 \to {}^1a^2 \to {}^0b^1 \to {}^2e^0 \to {}^1c^2 \to {}^2c^3 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,29}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,29}$ to $G^{(120)}_{8,29}$ are formed by decorating boundary cycles of $G_{8,29}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,30}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([6, 3, 4]),   # c
  Vertex([5, 5, 4]),   # d
  Vertex([0, 6, 7, 7]),# e
])
```

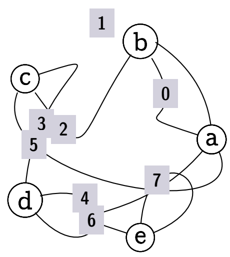
Boundary cycles

$$\alpha = ({}^{0}e^{1} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{3}e^{0} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{2}e^{3})$$

Markings

Fatgraph $G_{8,30}$ only has the identity automorphism, so the marked fatgraphs $G_{8,30}^{(0)}$ to $G_{8,30}^{(120)}$ are formed by decorating boundary cycles of $G_{8,30}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,31}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 6, 5]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 2, 3]),   # c
  Vertex([4, 4, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

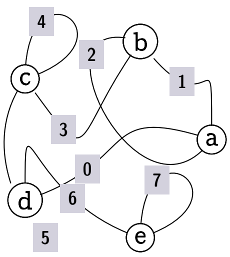
Boundary cycles

$$\alpha = ({}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^1b^2 \to {}^2a^3 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\gamma = ({}^2d^0 \to {}^3a^0 \to {}^2c^0 \to {}^1c^2 \to {}^0b^1 \to {}^1d^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,31}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,31}$ to $G^{(120)}_{8,31}$ are formed by decorating boundary cycles of $G_{8,31}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,32}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([5, 3, 4, 4]),# c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

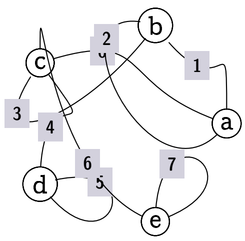
$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^1a^2 \to {}^0d^1 \to {}^3c^0 \to {}^1c^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,32}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,32}$ to $G^{(120)}_{8,32}$ are formed by decorating boundary cycles of $G_{8,32}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,33}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([3, 4, 0, 6]),# c
  Vertex([5, 5, 4]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{1}b^{2} \to {}^{2}e^{0} \to {}^{3}c^{0} \to {}^{2}c^{3} \to {}^{1}e^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{0}c^{1} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	c	e	d	3	2	1	0	6	7	4	5	β	α	γ	ϵ	δ

Markings

	$G_{8,33}^{(0)}$	$G_{8,33}^{(1)}$	$G_{8,33}^{(2)}$	$G_{8,33}^{(3)}$	$G_{8,33}^{(4)}$	$G_{8,33}^{(5)}$	$G_{8,33}^{(6)}$	$G_{8,33}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

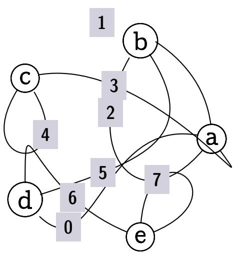
(continued.)

	$G_{8,33}^{(8)}$	$G_{8,33}^{(9)}$	$G_{8,33}^{(10)}$	$G_{8,33}^{(11)}$	$G_{8,33}^{(12)}$	$G_{8,33}^{(13)}$	$G_{8,33}^{(14)}$	$G_{8,33}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{8,33}^{(16)}$	$G_{8,33}^{(17)}$	$G_{8,33}^{(18)}$	$G_{8,33}^{(19)}$	$G_{8,33}^{(20)}$	$G_{8,33}^{(21)}$	$G_{8,33}^{(22)}$	$G_{8,33}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{8,33}^{(24)}$	$G_{8,33}^{(25)}$	$G_{8,33}^{(26)}$	$G_{8,33}^{(27)}$	$G_{8,33}^{(28)}$	$G_{8,33}^{(29)}$	$G_{8,33}^{(30)}$	$G_{8,33}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{8,33}^{(32)}$	$G_{8,33}^{(33)}$	$G_{8,33}^{(34)}$	$G_{8,33}^{(35)}$	$G_{8,33}^{(36)}$	$G_{8,33}^{(37)}$	$G_{8,33}^{(38)}$	$G_{8,33}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{8,33}^{(40)}$	$G_{8,33}^{(41)}$	$G_{8,33}^{(42)}$	$G_{8,33}^{(43)}$	$G_{8,33}^{(44)}$	$G_{8,33}^{(45)}$	$G_{8,33}^{(46)}$	$G_{8,33}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{8,33}^{(48)}$	$G_{8,33}^{(49)}$	$G_{8,33}^{(50)}$	$G_{8,33}^{(51)}$	$G_{8,33}^{(52)}$	$G_{8,33}^{(53)}$	$G_{8,33}^{(54)}$	$G_{8,33}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{8,33}^{(56)}$	$G_{8,33}^{(57)}$	$G_{8,33}^{(58)}$	$G_{8,33}^{(59)}$				
α	3	3	3	3				
β	4	4	4	4				
γ	1	1	2	2				
δ	0	2	0	1				
ϵ	2	0	1	0				

Differentials

$D(G_{8,33}^{(10)}) = +G_{7,0}^{(30)}$
$D(G_{8,33}^{(11)}) = +G_{7,0}^{(31)}$
$D(G_{8,33}^{(12)}) = +G_{7,0}^{(36)}$
$D(G_{8,33}^{(13)}) = +G_{7,0}^{(37)}$
$D(G_{8,33}^{(14)}) = +G_{7,0}^{(42)}$
$D(G_{8,33}^{(15)}) = +G_{7,0}^{(43)}$
$D(G_{8,33}^{(16)}) = +G_{7,0}^{(54)}$
$D(G_{8,33}^{(17)}) = +G_{7,0}^{(55)}$
$D(G_{8,33}^{(18)}) = +G_{7,0}^{(60)}$
$D(G_{8,33}^{(19)}) = +G_{7,0}^{(61)}$
$D(G_{8,33}^{(20)}) = +G_{7,0}^{(66)}$
$D(G_{8,33}^{(21)}) = +G_{7,0}^{(67)}$
$D(G_{8,33}^{(22)}) = +G_{7,0}^{(78)}$
$D(G_{8,33}^{(23)}) = +G_{7,0}^{(79)}$
$D(G_{8,33}^{(24)}) = +G_{7,0}^{(84)}$
$D(G_{8,33}^{(25)}) = +G_{7,0}^{(85)}$
$D(G_{8,33}^{(26)}) = +G_{7,0}^{(90)}$
$D(G_{8,33}^{(27)}) = +G_{7,0}^{(91)}$
$D(G_{8,33}^{(28)}) = +G_{7,0}^{(102)}$
$D(G_{8,33}^{(34)}) = +G_{7,0}^{(6)}$
$D(G_{8,33}^{(35)}) = +G_{7,0}^{(7)}$
$D(G_{8,33}^{(36)}) = +G_{7,0}^{(12)}$
$D(G_{8,33}^{(37)}) = +G_{7,0}^{(13)}$
$D(G_{8,33}^{(38)}) = +G_{7,0}^{(18)}$
$D(G_{8,33}^{(39)}) = +G_{7,0}^{(19)}$
$D(G_{8,33}^{(40)}) = +G_{7,0}^{(48)}$
$D(G_{8,33}^{(41)}) = +G_{7,0}^{(49)}$
$D(G_{8,33}^{(42)}) = +G_{7,0}^{(62)}$
$D(G_{8,33}^{(43)}) = +G_{7,0}^{(63)}$
$D(G_{8,33}^{(44)}) = +G_{7,0}^{(68)}$
$D(G_{8,33}^{(45)}) = +G_{7,0}^{(69)}$
$D(G_{8,33}^{(46)}) = +G_{7,0}^{(72)}$
$D(G_{8,33}^{(47)}) = +G_{7,0}^{(73)}$
$D(G_{8,33}^{(48)}) = +G_{7,0}^{(86)}$
$D(G_{8,33}^{(49)}) = +G_{7,0}^{(87)}$
$D(G_{8,33}^{(50)}) = +G_{7,0}^{(92)}$
$D(G_{8,33}^{(51)}) = +G_{7,0}^{(93)}$
$D(G_{8,33}^{(52)}) = +G_{7,0}^{(96)}$
$D(G_{8,33}^{(53)}) = +G_{7,0}^{(97)}$
$D(G_{8,33}^{(58)}) = +G_{7,0}^{(0)}$
$D(G_{8,33}^{(59)}) = +G_{7,0}^{(1)}$

The Fatgraph $G_{8,34}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 5]),   # b
  Vertex([4, 4, 3]),   # c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^0d^1 \to {}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^1b^2 \to {}^2e^0 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^3 \to {}^3a^0 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

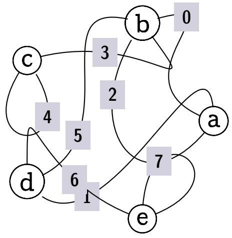
Fatgraph $G_{8,34}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,34}$ to $G^{(120)}_{8,34}$ are formed by decorating boundary cycles of $G_{8,34}$ with all permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$D(G^{(0)}_{8,34}) = +G^{(14)}_{7,0}$
$D(G^{(1)}_{8,34}) = +G^{(15)}_{7,0}$
$D(G^{(2)}_{8,34}) = +G^{(20)}_{7,0}$
$D(G^{(3)}_{8,34}) = +G^{(21)}_{7,0}$
$D(G^{(4)}_{8,34}) = +G^{(24)}_{7,0}$
$D(G^{(5)}_{8,34}) = +G^{(25)}_{7,0}$
$D(G^{(6)}_{8,34}) = +G^{(38)}_{7,0}$
$D(G^{(7)}_{8,34}) = +G^{(39)}_{7,0}$
$D(G^{(8)}_{8,34}) = +G^{(44)}_{7,0}$
$D(G^{(9)}_{8,34}) = +G^{(45)}_{7,0}$
$D(G^{(10)}_{8,34}) = +G^{(74)}_{7,0}$
$D(G^{(11)}_{8,34}) = +G^{(75)}_{7,0}$
$D(G^{(12)}_{8,34}) = +G^{(80)}_{7,0}$
$D(G^{(13)}_{8,34}) = +G^{(81)}_{7,0}$
$D(G^{(14)}_{8,34}) = +G^{(94)}_{7,0}$
$D(G^{(15)}_{8,34}) = +G^{(95)}_{7,0}$
$D(G^{(16)}_{8,34}) = +G^{(98)}_{7,0}$
$D(G^{(17)}_{8,34}) = +G^{(99)}_{7,0}$
$D(G^{(22)}_{8,34}) = +G^{(2)}_{7,0}$
$D(G^{(23)}_{8,34}) = +G^{(3)}_{7,0}$
$D(G^{(24)}_{8,34}) = +G^{(8)}_{7,0}$
$D(G^{(25)}_{8,34}) = +G^{(9)}_{7,0}$
$D(G^{(26)}_{8,34}) = +G^{(22)}_{7,0}$
$D(G^{(27)}_{8,34}) = +G^{(23)}_{7,0}$
$D(G^{(28)}_{8,34}) = +G^{(26)}_{7,0}$
$D(G^{(29)}_{8,34}) = +G^{(27)}_{7,0}$
$D(G^{(30)}_{8,34}) = +G^{(32)}_{7,0}$
$D(G^{(31)}_{8,34}) = +G^{(33)}_{7,0}$
$D(G^{(32)}_{8,34}) = +G^{(46)}_{7,0}$
$D(G^{(33)}_{8,34}) = +G^{(47)}_{7,0}$
$D(G^{(34)}_{8,34}) = +G^{(50)}_{7,0}$
$D(G^{(35)}_{8,34}) = +G^{(51)}_{7,0}$
$D(G^{(36)}_{8,34}) = +G^{(56)}_{7,0}$
$D(G^{(37)}_{8,34}) = +G^{(57)}_{7,0}$
$D(G^{(38)}_{8,34}) = +G^{(70)}_{7,0}$
$D(G^{(39)}_{8,34}) = +G^{(71)}_{7,0}$
$D(G^{(40)}_{8,34}) = +G^{(100)}_{7,0}$
$D(G^{(41)}_{8,34}) = +G^{(101)}_{7,0}$
$D(G^{(46)}_{8,34}) = +G^{(4)}_{7,0}$
$D(G^{(47)}_{8,34}) = +G^{(5)}_{7,0}$
$D(G^{(48)}_{8,34}) = +G^{(10)}_{7,0}$
$D(G^{(49)}_{8,34}) = +G^{(11)}_{7,0}$
$D(G^{(50)}_{8,34}) = +G^{(16)}_{7,0}$
$D(G^{(51)}_{8,34}) = +G^{(17)}_{7,0}$

$$D(G_{8,34}^{(52)}) = +G_{7,0}^{(28)}$$
$$D(G_{8,34}^{(53)}) = +G_{7,0}^{(29)}$$
$$D(G_{8,34}^{(54)}) = +G_{7,0}^{(34)}$$
$$D(G_{8,34}^{(55)}) = +G_{7,0}^{(35)}$$
$$D(G_{8,34}^{(56)}) = +G_{7,0}^{(40)}$$
$$D(G_{8,34}^{(57)}) = +G_{7,0}^{(41)}$$
$$D(G_{8,34}^{(58)}) = +G_{7,0}^{(52)}$$
$$D(G_{8,34}^{(59)}) = +G_{7,0}^{(53)}$$
$$D(G_{8,34}^{(60)}) = +G_{7,0}^{(58)}$$
$$D(G_{8,34}^{(61)}) = +G_{7,0}^{(59)}$$
$$D(G_{8,34}^{(62)}) = +G_{7,0}^{(64)}$$
$$D(G_{8,34}^{(63)}) = +G_{7,0}^{(65)}$$
$$D(G_{8,34}^{(64)}) = +G_{7,0}^{(76)}$$
$$D(G_{8,34}^{(65)}) = +G_{7,0}^{(77)}$$
$$D(G_{8,34}^{(66)}) = +G_{7,0}^{(82)}$$
$$D(G_{8,34}^{(67)}) = +G_{7,0}^{(83)}$$
$$D(G_{8,34}^{(68)}) = +G_{7,0}^{(88)}$$
$$D(G_{8,34}^{(69)}) = +G_{7,0}^{(89)}$$
$$D(G_{8,34}^{(70)}) = +G_{7,0}^{(72)}$$
$$D(G_{8,34}^{(71)}) = +G_{7,0}^{(96)}$$
$$D(G_{8,34}^{(72)}) = +G_{7,0}^{(48)}$$
$$D(G_{8,34}^{(73)}) = +G_{7,0}^{(97)}$$
$$D(G_{8,34}^{(74)}) = +G_{7,0}^{(49)}$$
$$D(G_{8,34}^{(75)}) = +G_{7,0}^{(73)}$$
$$D(G_{8,34}^{(76)}) = +G_{7,0}^{(74)}$$
$$D(G_{8,34}^{(77)}) = +G_{7,0}^{(98)}$$
$$D(G_{8,34}^{(78)}) = +G_{7,0}^{(24)}$$
$$D(G_{8,34}^{(79)}) = +G_{7,0}^{(99)}$$
$$D(G_{8,34}^{(80)}) = +G_{7,0}^{(25)}$$
$$D(G_{8,34}^{(81)}) = +G_{7,0}^{(75)}$$
$$D(G_{8,34}^{(82)}) = +G_{7,0}^{(50)}$$
$$D(G_{8,34}^{(83)}) = +G_{7,0}^{(100)}$$
$$D(G_{8,34}^{(84)}) = +G_{7,0}^{(26)}$$
$$D(G_{8,34}^{(85)}) = +G_{7,0}^{(101)}$$
$$D(G_{8,34}^{(86)}) = +G_{7,0}^{(27)}$$
$$D(G_{8,34}^{(87)}) = +G_{7,0}^{(51)}$$
$$D(G_{8,34}^{(88)}) = +G_{7,0}^{(52)}$$
$$D(G_{8,34}^{(89)}) = +G_{7,0}^{(76)}$$
$$D(G_{8,34}^{(90)}) = +G_{7,0}^{(28)}$$
$$D(G_{8,34}^{(91)}) = +G_{7,0}^{(77)}$$
$$D(G_{8,34}^{(92)}) = +G_{7,0}^{(29)}$$
$$D(G_{8,34}^{(93)}) = +G_{7,0}^{(53)}$$
$$D(G_{8,34}^{(94)}) = +G_{7,0}^{(78)}$$
$$D(G_{8,34}^{(95)}) = +G_{7,0}^{(102)}$$
$$D(G_{8,34}^{(96)}) = +G_{7,0}^{(54)}$$
$$D(G_{8,34}^{(98)}) = +G_{7,0}^{(55)}$$
$$D(G_{8,34}^{(99)}) = +G_{7,0}^{(79)}$$
$$D(G_{8,34}^{(100)}) = +G_{7,0}^{(80)}$$
$$D(G_{8,34}^{(102)}) = +G_{7,0}^{(0)}$$
$$D(G_{8,34}^{(104)}) = +G_{7,0}^{(1)}$$
$$D(G_{8,34}^{(105)}) = +G_{7,0}^{(81)}$$
$$D(G_{8,34}^{(106)}) = +G_{7,0}^{(56)}$$
$$D(G_{8,34}^{(108)}) = +G_{7,0}^{(2)}$$
$$D(G_{8,34}^{(110)}) = +G_{7,0}^{(3)}$$
$$D(G_{8,34}^{(111)}) = +G_{7,0}^{(57)}$$
$$D(G_{8,34}^{(112)}) = +G_{7,0}^{(58)}$$
$$D(G_{8,34}^{(113)}) = +G_{7,0}^{(82)}$$
$$D(G_{8,34}^{(114)}) = +G_{7,0}^{(4)}$$
$$D(G_{8,34}^{(115)}) = +G_{7,0}^{(83)}$$
$$D(G_{8,34}^{(116)}) = +G_{7,0}^{(5)}$$
$$D(G_{8,34}^{(117)}) = +G_{7,0}^{(59)}$$
$$D(G_{8,34}^{(118)}) = +G_{7,0}^{(84)}$$

The Fatgraph $G_{8,35}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([5, 2, 3, 0]),# b
  Vertex([4, 4, 3]),   # c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^3b^0 \to {}^2e^0 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^1a^2 \to {}^2b^3 \to {}^2c^0 \to {}^1c^2 \to {}^1b^2)$$
$$\gamma = ({}^2a^0 \to {}^0b^1 \to {}^0d^1)$$
$$\delta = ({}^0c^1)$$
$$\epsilon = ({}^0e^1)$$

Markings

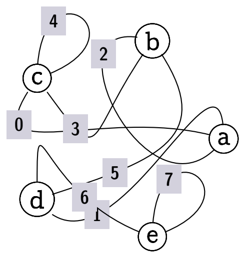
Fatgraph $G_{8,35}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,35}$ to $G^{(120)}_{8,35}$ are formed by decorating boundary cycles of $G_{8,35}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G^{(0)}_{8,35}) = +G^{(30)}_{7,0}$$
$$D(G^{(2)}_{8,35}) = +G^{(31)}_{7,0}$$
$$D(G^{(3)}_{8,35}) = +G^{(85)}_{7,0}$$
$$D(G^{(4)}_{8,35}) = +G^{(86)}_{7,0}$$
$$D(G^{(6)}_{8,35}) = +G^{(6)}_{7,0}$$
$$D(G^{(8)}_{8,35}) = +G^{(7)}_{7,0}$$
$$D(G^{(9)}_{8,35}) = +G^{(87)}_{7,0}$$
$$D(G^{(10)}_{8,35}) = +G^{(32)}_{7,0}$$
$$D(G^{(12)}_{8,35}) = +G^{(8)}_{7,0}$$
$$D(G^{(14)}_{8,35}) = +G^{(9)}_{7,0}$$
$$D(G^{(15)}_{8,35}) = +G^{(33)}_{7,0}$$
$$D(G^{(16)}_{8,35}) = +G^{(34)}_{7,0}$$
$$D(G^{(17)}_{8,35}) = +G^{(88)}_{7,0}$$
$$D(G^{(18)}_{8,35}) = +G^{(10)}_{7,0}$$
$$D(G^{(19)}_{8,35}) = +G^{(89)}_{7,0}$$
$$D(G^{(20)}_{8,35}) = +G^{(11)}_{7,0}$$
$$D(G^{(21)}_{8,35}) = +G^{(35)}_{7,0}$$
$$D(G^{(22)}_{8,35}) = +G^{(60)}_{7,0}$$
$$D(G^{(24)}_{8,35}) = +G^{(36)}_{7,0}$$
$$D(G^{(26)}_{8,35}) = +G^{(37)}_{7,0}$$
$$D(G^{(27)}_{8,35}) = +G^{(61)}_{7,0}$$
$$D(G^{(28)}_{8,35}) = +G^{(62)}_{7,0}$$
$$D(G^{(30)}_{8,35}) = +G^{(12)}_{7,0}$$
$$D(G^{(32)}_{8,35}) = +G^{(13)}_{7,0}$$

$D(G_{8,35}^{(33)}) = +G_{7,0}^{(63)}$
$D(G_{8,35}^{(34)}) = +G_{7,0}^{(38)}$
$D(G_{8,35}^{(36)}) = +G_{7,0}^{(14)}$
$D(G_{8,35}^{(38)}) = +G_{7,0}^{(15)}$
$D(G_{8,35}^{(39)}) = +G_{7,0}^{(39)}$
$D(G_{8,35}^{(40)}) = +G_{7,0}^{(40)}$
$D(G_{8,35}^{(41)}) = +G_{7,0}^{(64)}$
$D(G_{8,35}^{(42)}) = +G_{7,0}^{(16)}$
$D(G_{8,35}^{(43)}) = +G_{7,0}^{(65)}$
$D(G_{8,35}^{(44)}) = +G_{7,0}^{(17)}$
$D(G_{8,35}^{(45)}) = +G_{7,0}^{(41)}$
$D(G_{8,35}^{(46)}) = +G_{7,0}^{(66)}$
$D(G_{8,35}^{(47)}) = +G_{7,0}^{(90)}$
$D(G_{8,35}^{(48)}) = +G_{7,0}^{(42)}$
$D(G_{8,35}^{(49)}) = +G_{7,0}^{(91)}$
$D(G_{8,35}^{(50)}) = +G_{7,0}^{(43)}$
$D(G_{8,35}^{(51)}) = +G_{7,0}^{(67)}$
$D(G_{8,35}^{(52)}) = +G_{7,0}^{(68)}$
$D(G_{8,35}^{(53)}) = +G_{7,0}^{(92)}$
$D(G_{8,35}^{(54)}) = +G_{7,0}^{(18)}$
$D(G_{8,35}^{(55)}) = +G_{7,0}^{(93)}$
$D(G_{8,35}^{(56)}) = +G_{7,0}^{(19)}$
$D(G_{8,35}^{(57)}) = +G_{7,0}^{(69)}$
$D(G_{8,35}^{(58)}) = +G_{7,0}^{(44)}$
$D(G_{8,35}^{(59)}) = +G_{7,0}^{(94)}$
$D(G_{8,35}^{(60)}) = +G_{7,0}^{(20)}$
$D(G_{8,35}^{(61)}) = +G_{7,0}^{(95)}$
$D(G_{8,35}^{(62)}) = +G_{7,0}^{(21)}$
$D(G_{8,35}^{(63)}) = +G_{7,0}^{(45)}$
$D(G_{8,35}^{(64)}) = +G_{7,0}^{(46)}$
$D(G_{8,35}^{(65)}) = +G_{7,0}^{(70)}$
$D(G_{8,35}^{(66)}) = +G_{7,0}^{(22)}$
$D(G_{8,35}^{(67)}) = +G_{7,0}^{(71)}$
$D(G_{8,35}^{(68)}) = +G_{7,0}^{(23)}$
$D(G_{8,35}^{(69)}) = +G_{7,0}^{(47)}$

The Fatgraph $G_{8,36}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 5]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([1, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^1a^2 \to {}^3c^0 \to {}^1c^2 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0 \to {}^0d^1)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0e^1)$$

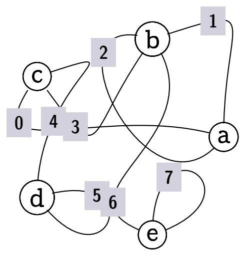
Markings

Fatgraph $G_{8,36}$ only has the identity automorphism, so the marked fatgraphs $G_{8,36}^{(0)}$ to $G_{8,36}^{(120)}$ are formed by decorating boundary cycles of $G_{8,36}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{8,36}^{(70)}) = +G_{7,0}^{(32)}$$
$$D(G_{8,36}^{(71)}) = +G_{7,0}^{(34)}$$
$$D(G_{8,36}^{(72)}) = +G_{7,0}^{(38)}$$
$$D(G_{8,36}^{(73)}) = +G_{7,0}^{(40)}$$
$$D(G_{8,36}^{(74)}) = +G_{7,0}^{(44)}$$
$$D(G_{8,36}^{(75)}) = +G_{7,0}^{(46)}$$
$$D(G_{8,36}^{(76)}) = +G_{7,0}^{(56)}$$
$$D(G_{8,36}^{(77)}) = +G_{7,0}^{(58)}$$
$$D(G_{8,36}^{(78)}) = +G_{7,0}^{(62)}$$
$$D(G_{8,36}^{(79)}) = +G_{7,0}^{(64)}$$
$$D(G_{8,36}^{(80)}) = +G_{7,0}^{(68)}$$
$$D(G_{8,36}^{(81)}) = +G_{7,0}^{(70)}$$
$$D(G_{8,36}^{(82)}) = +G_{7,0}^{(80)}$$
$$D(G_{8,36}^{(83)}) = +G_{7,0}^{(82)}$$
$$D(G_{8,36}^{(84)}) = +G_{7,0}^{(86)}$$
$$D(G_{8,36}^{(85)}) = +G_{7,0}^{(88)}$$
$$D(G_{8,36}^{(86)}) = +G_{7,0}^{(92)}$$
$$D(G_{8,36}^{(87)}) = +G_{7,0}^{(94)}$$
$$D(G_{8,36}^{(94)}) = +G_{7,0}^{(8)}$$
$$D(G_{8,36}^{(95)}) = +G_{7,0}^{(10)}$$
$$D(G_{8,36}^{(96)}) = +G_{7,0}^{(14)}$$
$$D(G_{8,36}^{(97)}) = +G_{7,0}^{(16)}$$
$$D(G_{8,36}^{(98)}) = +G_{7,0}^{(20)}$$
$$D(G_{8,36}^{(99)}) = +G_{7,0}^{(22)}$$
$$D(G_{8,36}^{(100)}) = +G_{7,0}^{(50)}$$
$$D(G_{8,36}^{(101)}) = +G_{7,0}^{(52)}$$
$$D(G_{8,36}^{(102)}) = +G_{7,0}^{(60)}$$
$$D(G_{8,36}^{(103)}) = +G_{7,0}^{(65)}$$
$$D(G_{8,36}^{(104)}) = +G_{7,0}^{(66)}$$
$$D(G_{8,36}^{(105)}) = +G_{7,0}^{(71)}$$
$$D(G_{8,36}^{(106)}) = +G_{7,0}^{(74)}$$
$$D(G_{8,36}^{(107)}) = +G_{7,0}^{(76)}$$
$$D(G_{8,36}^{(108)}) = +G_{7,0}^{(84)}$$
$$D(G_{8,36}^{(109)}) = +G_{7,0}^{(89)}$$
$$D(G_{8,36}^{(110)}) = +G_{7,0}^{(90)}$$
$$D(G_{8,36}^{(111)}) = +G_{7,0}^{(95)}$$
$$D(G_{8,36}^{(112)}) = +G_{7,0}^{(98)}$$
$$D(G_{8,36}^{(113)}) = +G_{7,0}^{(100)}$$
$$D(G_{8,36}^{(118)}) = +G_{7,0}^{(2)}$$
$$D(G_{8,36}^{(119)}) = +G_{7,0}^{(4)}$$

The Fatgraph $G_{8,37}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 6, 1]),# b
  Vertex([0, 3, 4]),   # c
  Vertex([5, 5, 4]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{2}b^{3} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{1}b^{2} \to {}^{1}e^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{3}b^{0})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

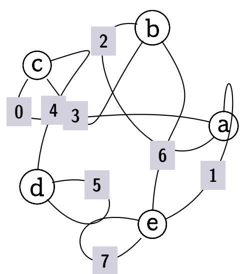
Fatgraph $G_{8,37}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,37}$ to $G^{(120)}_{8,37}$ are formed by decorating boundary cycles of $G_{8,37}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G^{(0)}_{8,37}) = +G^{(12)}_{7,0}$$
$$D(G^{(1)}_{8,37}) = +G^{(17)}_{7,0}$$
$$D(G^{(2)}_{8,37}) = +G^{(18)}_{7,0}$$
$$D(G^{(3)}_{8,37}) = +G^{(23)}_{7,0}$$
$$D(G^{(4)}_{8,37}) = +G^{(26)}_{7,0}$$
$$D(G^{(5)}_{8,37}) = +G^{(28)}_{7,0}$$
$$D(G^{(6)}_{8,37}) = +G^{(36)}_{7,0}$$
$$D(G^{(7)}_{8,37}) = +G^{(41)}_{7,0}$$
$$D(G^{(8)}_{8,37}) = +G^{(42)}_{7,0}$$
$$D(G^{(9)}_{8,37}) = +G^{(47)}_{7,0}$$
$$D(G^{(10)}_{8,37}) = +G^{(72)}_{7,0}$$
$$D(G^{(11)}_{8,37}) = +G^{(77)}_{7,0}$$
$$D(G^{(12)}_{8,37}) = +G^{(78)}_{7,0}$$
$$D(G^{(13)}_{8,37}) = +G^{(83)}_{7,0}$$
$$D(G^{(14)}_{8,37}) = +G^{(91)}_{7,0}$$
$$D(G^{(15)}_{8,37}) = +G^{(93)}_{7,0}$$
$$D(G^{(16)}_{8,37}) = +G^{(96)}_{7,0}$$
$$D(G^{(17)}_{8,37}) = +G^{(101)}_{7,0}$$
$$D(G^{(18)}_{8,37}) = +G^{(102)}_{7,0}$$
$$D(G^{(22)}_{8,37}) = +G^{(0)}_{7,0}$$
$$D(G^{(23)}_{8,37}) = +G^{(5)}_{7,0}$$
$$D(G^{(24)}_{8,37}) = +G^{(6)}_{7,0}$$
$$D(G^{(25)}_{8,37}) = +G^{(11)}_{7,0}$$
$$D(G^{(26)}_{8,37}) = +G^{(19)}_{7,0}$$

$D(G_{8,37}^{(27)}) = +G_{7,0}^{(21)}$
$D(G_{8,37}^{(28)}) = +G_{7,0}^{(24)}$
$D(G_{8,37}^{(29)}) = +G_{7,0}^{(29)}$
$D(G_{8,37}^{(30)}) = +G_{7,0}^{(30)}$
$D(G_{8,37}^{(31)}) = +G_{7,0}^{(35)}$
$D(G_{8,37}^{(32)}) = +G_{7,0}^{(43)}$
$D(G_{8,37}^{(33)}) = +G_{7,0}^{(45)}$
$D(G_{8,37}^{(34)}) = +G_{7,0}^{(48)}$
$D(G_{8,37}^{(35)}) = +G_{7,0}^{(53)}$
$D(G_{8,37}^{(36)}) = +G_{7,0}^{(54)}$
$D(G_{8,37}^{(37)}) = +G_{7,0}^{(59)}$
$D(G_{8,37}^{(38)}) = +G_{7,0}^{(67)}$
$D(G_{8,37}^{(39)}) = +G_{7,0}^{(69)}$
$D(G_{8,37}^{(40)}) = +G_{7,0}^{(97)}$
$D(G_{8,37}^{(41)}) = +G_{7,0}^{(99)}$
$D(G_{8,37}^{(46)}) = +G_{7,0}^{(1)}$
$D(G_{8,37}^{(47)}) = +G_{7,0}^{(3)}$
$D(G_{8,37}^{(48)}) = +G_{7,0}^{(7)}$
$D(G_{8,37}^{(49)}) = +G_{7,0}^{(9)}$
$D(G_{8,37}^{(50)}) = +G_{7,0}^{(13)}$
$D(G_{8,37}^{(51)}) = +G_{7,0}^{(15)}$
$D(G_{8,37}^{(52)}) = +G_{7,0}^{(25)}$
$D(G_{8,37}^{(53)}) = +G_{7,0}^{(27)}$
$D(G_{8,37}^{(54)}) = +G_{7,0}^{(31)}$
$D(G_{8,37}^{(55)}) = +G_{7,0}^{(33)}$
$D(G_{8,37}^{(56)}) = +G_{7,0}^{(37)}$
$D(G_{8,37}^{(57)}) = +G_{7,0}^{(39)}$
$D(G_{8,37}^{(58)}) = +G_{7,0}^{(49)}$
$D(G_{8,37}^{(59)}) = +G_{7,0}^{(51)}$
$D(G_{8,37}^{(60)}) = +G_{7,0}^{(55)}$
$D(G_{8,37}^{(61)}) = +G_{7,0}^{(57)}$
$D(G_{8,37}^{(62)}) = +G_{7,0}^{(61)}$
$D(G_{8,37}^{(63)}) = +G_{7,0}^{(63)}$
$D(G_{8,37}^{(64)}) = +G_{7,0}^{(73)}$
$D(G_{8,37}^{(65)}) = +G_{7,0}^{(75)}$
$D(G_{8,37}^{(66)}) = +G_{7,0}^{(79)}$
$D(G_{8,37}^{(67)}) = +G_{7,0}^{(81)}$
$D(G_{8,37}^{(68)}) = +G_{7,0}^{(85)}$
$D(G_{8,37}^{(69)}) = +G_{7,0}^{(87)}$

The Fatgraph $G_{8,38}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 6]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([5, 5, 4]),   # d
  Vertex([1, 6, 7, 7]),# e
])
```

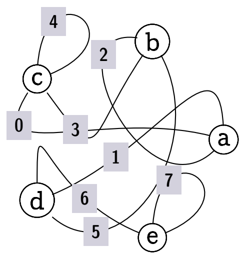
Boundary cycles

$$\alpha = ({}^1e^2 \to {}^3e^0 \to {}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^2c^0 \to {}^1c^2 \to {}^0b^1 \to {}^1d^2)$$
$$\gamma = ({}^0e^1 \to {}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^2e^3)$$

Markings

Fatgraph $G_{8,38}$ only has the identity automorphism, so the marked fatgraphs $G_{8,38}^{(0)}$ to $G_{8,38}^{(120)}$ are formed by decorating boundary cycles of $G_{8,38}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,39}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 5]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([5, 1, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

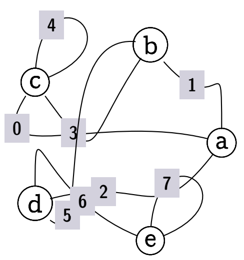
$$\alpha = ({}^0d^1 \to {}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^3c^0 \to {}^1c^2 \to {}^0b^1)$$
$$\gamma = ({}^2d^0 \to {}^2a^0 \to {}^2e^0 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$$
$$\delta = ({}^2c^3)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,39}$ only has the identity automorphism, so the marked fatgraphs $G_{8,39}^{(0)}$ to $G_{8,39}^{(120)}$ are formed by decorating boundary cycles of $G_{8,39}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,40}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([5, 3, 1]),   # b
  Vertex([0, 3, 4, 4]),# c
  Vertex([5, 2, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

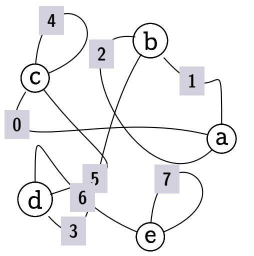
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{3}c^{0} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,40}$ only has the identity automorphism, so the marked fatgraphs $G_{8,40}^{(0)}$ to $G_{8,40}^{(120)}$ are formed by decorating boundary cycles of $G_{8,40}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,41}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 5, 4, 4]),# c
  Vertex([3, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

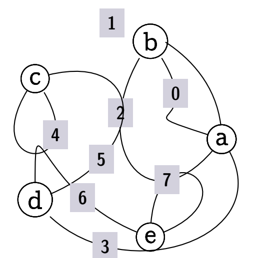
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}b^{2} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\beta = ({}^{1}a^{2} \to {}^{0}d^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{2}c^{3})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,41}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,41}$ to $G^{(120)}_{8,41}$ are formed by decorating boundary cycles of $G_{8,41}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,42}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([4, 4, 5]),   # c
  Vertex([3, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

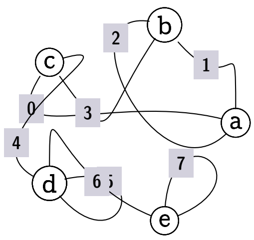
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{0}d^{1} \to {}^{0}b^{1} \to {}^{1}e^{2} \to {}^{1}d^{2}) \\
\delta &= ({}^{0}c^{1}) \\
\epsilon &= ({}^{0}e^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{8,42}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,42}$ to $G^{(120)}_{8,42}$ are formed by decorating boundary cycles of $G_{8,42}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,43}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([5, 5, 6, 4]),# d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

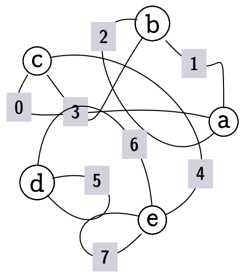
$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}d^{3} \to {}^{3}d^{0} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0}) \\
\delta &= ({}^{0}d^{1}) \\
\epsilon &= ({}^{0}e^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{8,43}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,43}$ to $G^{(120)}_{8,43}$ are formed by decorating boundary cycles of $G_{8,43}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,44}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([5, 5, 6]),   # d
  Vertex([4, 6, 7, 7]),# e
])
```

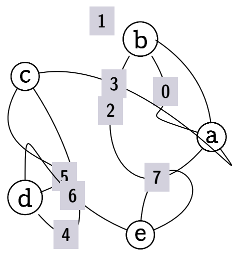
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^0a^1 \to {}^0c^1 \to {}^1b^2) \\
\beta &= ({}^0e^1 \to {}^2d^0 \to {}^1a^2 \to {}^3e^0 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^1e^2 \to {}^1d^2) \\
\gamma &= ({}^2a^0 \to {}^2b^0) \\
\delta &= ({}^0d^1) \\
\epsilon &= ({}^2e^3)
\end{aligned}$$

Markings

Fatgraph $G_{8,44}$ only has the identity automorphism, so the marked fatgraphs $G_{8,44}^{(0)}$ to $G_{8,44}^{(120)}$ are formed by decorating boundary cycles of $G_{8,44}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,45}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 4, 3]),   # c
  Vertex([4, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

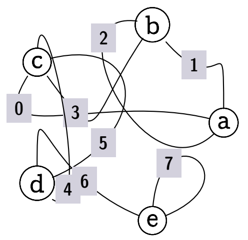
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{0}b^{1} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}d^{1} \to {}^{0}c^{1})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,45}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,45}$ to $G^{(120)}_{8,45}$ are formed by decorating boundary cycles of $G_{8,45}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,46}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 5, 4]),# c
  Vertex([4, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

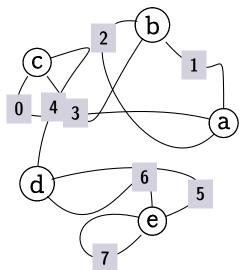
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^0a^1 \to {}^0c^1 \to {}^1b^2) \\
\beta &= ({}^2d^0 \to {}^3c^0 \to {}^1a^2 \to {}^0b^1 \to {}^2e^0 \to {}^1c^2 \to {}^1e^2 \to {}^1d^2) \\
\gamma &= ({}^2a^0 \to {}^2b^0) \\
\delta &= ({}^0d^1 \to {}^2c^3) \\
\epsilon &= ({}^0e^1)
\end{aligned}
$$

Markings

Fatgraph $G_{8,46}$ only has the identity automorphism, so the marked fatgraphs $G_{8,46}^{(0)}$ to $G_{8,46}^{(120)}$ are formed by decorating boundary cycles of $G_{8,46}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,47}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([6, 5, 4]),   # d
  Vertex([5, 6, 7, 7]),# e
])
```

Boundary cycles

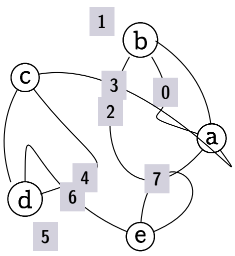
$$
\begin{aligned}
\alpha &= ({}^0a^1 \to {}^0c^1 \to {}^1b^2) \\
\beta &= ({}^2d^0 \to {}^1a^2 \to {}^1e^2 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^3e^0 \to {}^1d^2) \\
\gamma &= ({}^2a^0 \to {}^2b^0) \\
\delta &= ({}^0e^1 \to {}^0d^1) \\
\epsilon &= ({}^2e^3)
\end{aligned}
$$

Markings

Fatgraph $G_{8,47}$ only has the identity automorphism, so the marked fatgraphs $G_{8,47}^{(0)}$ to $G_{8,47}^{(120)}$ are formed by decorating boundary cycles of $G_{8,47}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,48}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([5, 4, 3]),   # c
  Vertex([5, 4, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

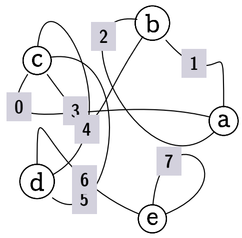
Boundary cycles

$$\alpha = ({}^2b^0 \to {}^0a^1)$$
$$\beta = ({}^1a^2 \to {}^1b^2)$$
$$\gamma = ({}^2a^3 \to {}^0b^1 \to {}^3a^0 \to {}^1c^2 \to {}^0d^1 \to {}^2c^0)$$
$$\delta = ({}^2d^0 \to {}^1e^2 \to {}^1d^2 \to {}^0c^1 \to {}^2e^0)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,48}$ only has the identity automorphism, so the marked fatgraphs $G_{8,48}^{(0)}$ to $G_{8,48}^{(120)}$ are formed by decorating boundary cycles of $G_{8,48}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,49}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 5, 4]),# c
  Vertex([5, 4, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

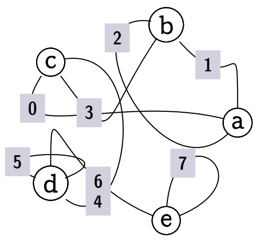
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}d^{1} \to {}^{3}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0}) \\
\delta &= ({}^{2}d^{0} \to {}^{2}c^{3} \to {}^{1}e^{2} \to {}^{1}d^{2} \to {}^{2}e^{0}) \\
\epsilon &= ({}^{0}e^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{8,49}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,49}$ to $G^{(120)}_{8,49}$ are formed by decorating boundary cycles of $G_{8,49}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,50}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([4, 5, 6, 5]),# d
  Vertex([7, 7, 6]),   # e
])
```

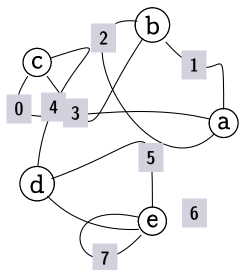
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})\\
\beta &= ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{3}d^{0} \to {}^{0}d^{1} \to {}^{0}b^{1})\\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0})\\
\delta &= ({}^{2}d^{3} \to {}^{1}e^{2} \to {}^{1}d^{2} \to {}^{2}e^{0})\\
\epsilon &= ({}^{0}e^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{8,50}$ only has the identity automorphism, so the marked fatgraphs $G_{8,50}^{(0)}$ to $G_{8,50}^{(120)}$ are formed by decorating boundary cycles of $G_{8,50}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,51}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 4]),   # c
  Vertex([6, 5, 4]),   # d
  Vertex([6, 5, 7, 7]),# e
])
```

Boundary cycles

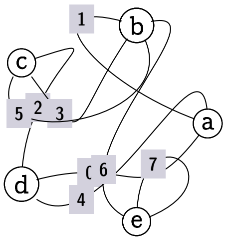
$$
\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})\\
\beta &= ({}^{2}d^{0} \to {}^{0}e^{1} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}d^{2})\\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0})\\
\delta &= ({}^{0}d^{1} \to {}^{3}e^{0} \to {}^{1}e^{2})\\
\epsilon &= ({}^{2}e^{3})
\end{aligned}
$$

Markings

Fatgraph $G_{8,51}$ only has the identity automorphism, so the marked fatgraphs $G_{8,51}^{(0)}$ to $G_{8,51}^{(120)}$ are formed by decorating boundary cycles of $G_{8,51}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,52}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 1, 0]),   # a
  Vertex([1, 3, 5, 6]),# b
  Vertex([5, 3, 2]),   # c
  Vertex([4, 0, 2]),   # d
  Vertex([7, 7, 6]),   # e
])
```

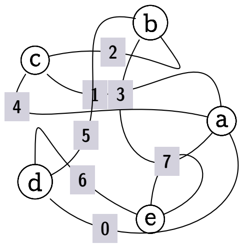
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{3} \to {}^{3}b^{0} \to {}^{2}e^{0} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{0}c^{1} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,52}$ only has the identity automorphism, so the marked fatgraphs $G_{8,52}^{(0)}$ to $G_{8,52}^{(120)}$ are formed by decorating boundary cycles of $G_{8,52}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,53}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 3, 0]),# a
  Vertex([5, 3, 2]),   # b
  Vertex([4, 1, 2]),   # c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

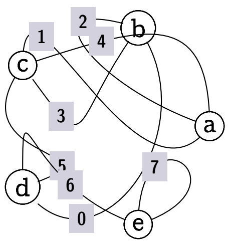
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}d^{1} \to {}^{0}b^{1})$$
$$\delta = ({}^{2}d^{0} \to {}^{3}a^{0} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,53}$ only has the identity automorphism, so the marked fatgraphs $G_{8,53}^{(0)}$ to $G_{8,53}^{(120)}$ are formed by decorating boundary cycles of $G_{8,53}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,54}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([5, 3, 4, 1]),# c
  Vertex([0, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

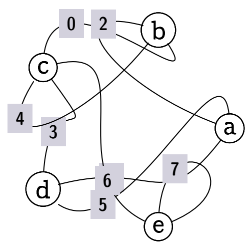
Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}e^{0} \to {}^{3}c^{0} \to {}^{2}b^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}c^{3})$$
$$\delta = ({}^{0}d^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,54}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,54}$ to $G^{(120)}_{8,54}$ are formed by decorating boundary cycles of $G_{8,54}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,55}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 4, 0]),   # b
  Vertex([4, 3, 6, 0]),# c
  Vertex([5, 1, 3]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

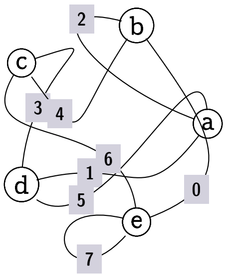
$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}b^{0} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}c^{3} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{3}c^{0} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,55}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,55}$ to $G^{(120)}_{8,55}$ are formed by decorating boundary cycles of $G_{8,55}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,56}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 4, 0]),   # b
  Vertex([6, 4, 3]),   # c
  Vertex([5, 1, 3]),   # d
  Vertex([0, 6, 7, 7]),# e
])
```

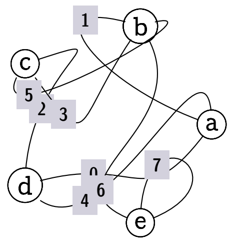
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}e^{2} \to {}^{2}c^{0} \to {}^{2}b^{0} \to {}^{3}e^{0} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{0}e^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{2}e^{3})$$

Markings

Fatgraph $G_{8,56}$ only has the identity automorphism, so the marked fatgraphs $G_{8,56}^{(0)}$ to $G_{8,56}^{(120)}$ are formed by decorating boundary cycles of $G_{8,56}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,57}$ (120 orientable markings)



```
Fatgraph([
  Vertex([4, 1, 0]),   # a
  Vertex([1, 3, 6, 5]),# b
  Vertex([5, 3, 2]),   # c
  Vertex([4, 0, 2]),   # d
  Vertex([7, 7, 6]),   # e
])
```

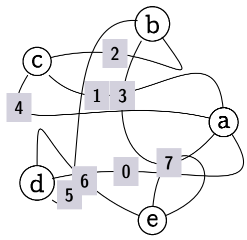
Boundary cycles

$$\alpha = ({}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{3}b^{0} \to {}^{1}d^{2} \to {}^{2}c^{0})$$
$$\gamma = ({}^{2}a^{0} \to {}^{0}d^{1})$$
$$\delta = ({}^{2}b^{3} \to {}^{1}e^{2} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\epsilon = ({}^{0}e^{1})$$

Markings

Fatgraph $G_{8,57}$ only has the identity automorphism, so the marked fatgraphs $G_{8,57}^{(0)}$ to $G_{8,57}^{(120)}$ are formed by decorating boundary cycles of $G_{8,57}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,58}$ (120 orientable markings)



```
Fatgraph([
  Vertex([1, 4, 3, 0]),# a
  Vertex([5, 3, 2]),   # b
  Vertex([4, 1, 2]),   # c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

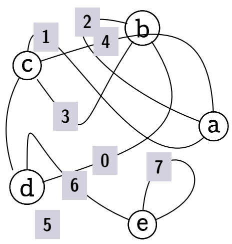
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2}) \\
\gamma &= ({}^{2}d^{0} \to {}^{2}a^{3} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}e^{2} \to {}^{1}d^{2}) \\
\delta &= ({}^{3}a^{0} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{1}c^{2}) \\
\epsilon &= ({}^{0}e^{1})
\end{aligned}$$

Markings

Fatgraph $G_{8,58}$ only has the identity automorphism, so the marked fatgraphs $G_{8,58}^{(0)}$ to $G_{8,58}^{(120)}$ are formed by decorating boundary cycles of $G_{8,58}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,59}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 2, 1]),   # a
  Vertex([2, 3, 0]),   # b
  Vertex([5, 3, 4, 1]),# c
  Vertex([5, 0, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

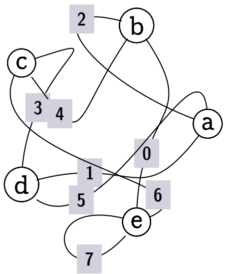
$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{0}d^{1} \to {}^{2}b^{0} \to {}^{3}c^{0}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}c^{3}) \\
\delta &= ({}^{2}d^{0} \to {}^{1}b^{2} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{1}e^{2} \to {}^{1}d^{2}) \\
\epsilon &= ({}^{0}e^{1})
\end{aligned}$$

Markings

Fatgraph $G_{8,59}$ only has the identity automorphism, so the marked fatgraphs $G_{8,59}^{(0)}$ to $G_{8,59}^{(120)}$ are formed by decorating boundary cycles of $G_{8,59}$ with all

permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,60}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([2, 4, 0]),   # b
  Vertex([6, 4, 3]),   # c
  Vertex([5, 1, 3]),   # d
  Vertex([6, 0, 7, 7]),# e
])
```

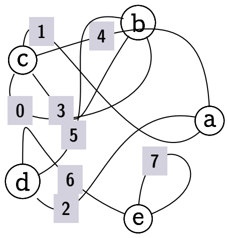
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^0e^1 \to {}^2b^0 \to {}^1d^2 \to {}^2c^0)$$
$$\gamma = ({}^2a^0 \to {}^0d^1)$$
$$\delta = ({}^3e^0 \to {}^1e^2 \to {}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^2e^3)$$

Markings

Fatgraph $G_{8,60}$ only has the identity automorphism, so the marked fatgraphs $G_{8,60}^{(0)}$ to $G_{8,60}^{(120)}$ are formed by decorating boundary cycles of $G_{8,60}$ with all permutations of $(0,1,2,3,4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,61}$ (120 orientable markings)




```
Fatgraph([
  Vertex([4, 2, 1]),   # a
  Vertex([5, 3, 0]),   # b
  Vertex([0, 3, 4, 1]),# c
  Vertex([2, 5, 6]),   # d
  Vertex([7, 7, 6]),   # e
])
```

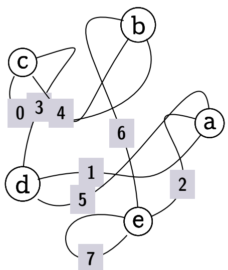
Boundary cycles

$$\alpha = ({}^0d^1 \to {}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^2e^0 \to {}^3c^0 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2c^3)$$
$$\delta = ({}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^0e^1)$$

Markings

Fatgraph $G_{8,61}$ only has the identity automorphism, so the marked fatgraphs $G_{8,61}^{(0)}$ to $G_{8,61}^{(120)}$ are formed by decorating boundary cycles of $G_{8,61}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,62}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),   # a
  Vertex([6, 4, 0]),   # b
  Vertex([0, 4, 3]),   # c
  Vertex([5, 1, 3]),   # d
  Vertex([2, 6, 7, 7]),# e
])
```

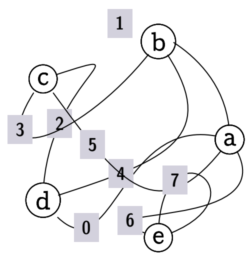
Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^{0}e^{1} \to {}^{2}d^{0} \to {}^{0}a^{1} \to {}^{1}c^{2} \to {}^{0}b^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{1}e^{2} \to {}^{2}c^{0} \to {}^{2}b^{0} \to {}^{3}e^{0} \to {}^{1}d^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{0}d^{1}) \\
\delta &= ({}^{0}c^{1} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{2}e^{3})
\end{aligned}
$$

Markings

Fatgraph $G_{8,62}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,62}$ to $G^{(120)}_{8,62}$ are formed by decorating boundary cycles of $G_{8,62}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,63}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 6]),# a
  Vertex([1, 3, 4]),   # b
  Vertex([3, 5, 2]),   # c
  Vertex([0, 4, 2]),   # d
  Vertex([7, 7, 6]),   # e
])
```

Boundary cycles

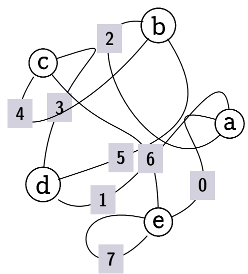
$$
\begin{aligned}
\alpha &= ({}^{0}d^{1} \to {}^{2}b^{0} \to {}^{0}a^{1}) \\
\beta &= ({}^{1}a^{2} \to {}^{2}d^{0} \to {}^{1}c^{2}) \\
\gamma &= ({}^{2}a^{3} \to {}^{0}b^{1} \to {}^{3}a^{0} \to {}^{2}e^{0} \to {}^{0}c^{1} \to {}^{1}e^{2}) \\
\delta &= ({}^{2}c^{0} \to {}^{1}d^{2} \to {}^{1}b^{2}) \\
\epsilon &= ({}^{0}e^{1})
\end{aligned}
$$

Markings

Fatgraph $G_{8,63}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{8,63}$ to $G^{(120)}_{8,63}$ are formed by decorating boundary cycles of $G_{8,63}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,64}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 4, 5]),   # b
  Vertex([4, 6, 3]),   # c
  Vertex([1, 5, 3]),   # d
  Vertex([0, 6, 7, 7]),# e
])
```

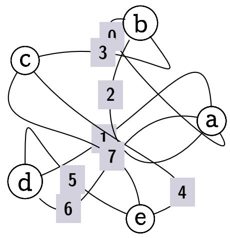
Boundary cycles

$$\alpha = ({}^0e^1 \to {}^2d^0 \to {}^0a^1 \to {}^1c^2)$$
$$\beta = ({}^1a^2 \to {}^3e^0 \to {}^1e^2 \to {}^0c^1 \to {}^0b^1)$$
$$\gamma = ({}^2a^0 \to {}^2b^0 \to {}^0d^1)$$
$$\delta = ({}^2c^0 \to {}^1d^2 \to {}^1b^2)$$
$$\epsilon = ({}^2e^3)$$

Markings

Fatgraph $G_{8,64}$ only has the identity automorphism, so the marked fatgraphs $G_{8,64}^{(0)}$ to $G_{8,64}^{(120)}$ are formed by decorating boundary cycles of $G_{8,64}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,65}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 6, 2, 0]),# a
  Vertex([0, 2, 3]),   # b
  Vertex([7, 4, 3]),   # c
  Vertex([6, 1, 5]),   # d
  Vertex([4, 7, 5]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{0}d^{1} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}d^{0} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}a^{0} \to {}^{2}b^{0} \to {}^{1}d^{2} \to {}^{1}c^{2} \to {}^{2}e^{0})$$
$$\epsilon = ({}^{0}e^{1} \to {}^{0}c^{1})$$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	a	d	e	b	c	6	2	1	5	7	3	0	4	γ	δ	α	β	ϵ

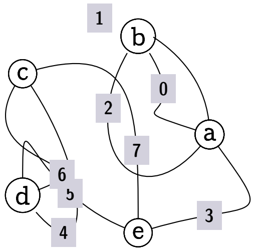
Markings

	$G^{(0)}_{8,65}$	$G^{(1)}_{8,65}$	$G^{(2)}_{8,65}$	$G^{(3)}_{8,65}$	$G^{(4)}_{8,65}$	$G^{(5)}_{8,65}$	$G^{(6)}_{8,65}$	$G^{(7)}_{8,65}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{8,65}$	$G^{(9)}_{8,65}$	$G^{(10)}_{8,65}$	$G^{(11)}_{8,65}$	$G^{(12)}_{8,65}$	$G^{(13)}_{8,65}$	$G^{(14)}_{8,65}$	$G^{(15)}_{8,65}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G^{(16)}_{8,65}$	$G^{(17)}_{8,65}$	$G^{(18)}_{8,65}$	$G^{(19)}_{8,65}$	$G^{(20)}_{8,65}$	$G^{(21)}_{8,65}$	$G^{(22)}_{8,65}$	$G^{(23)}_{8,65}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{8,65}$	$G^{(25)}_{8,65}$	$G^{(26)}_{8,65}$	$G^{(27)}_{8,65}$	$G^{(28)}_{8,65}$	$G^{(29)}_{8,65}$	$G^{(30)}_{8,65}$	$G^{(31)}_{8,65}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G^{(32)}_{8,65}$	$G^{(33)}_{8,65}$	$G^{(34)}_{8,65}$	$G^{(35)}_{8,65}$	$G^{(36)}_{8,65}$	$G^{(37)}_{8,65}$	$G^{(38)}_{8,65}$	$G^{(39)}_{8,65}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G^{(40)}_{8,65}$	$G^{(41)}_{8,65}$	$G^{(42)}_{8,65}$	$G^{(43)}_{8,65}$	$G^{(44)}_{8,65}$	$G^{(45)}_{8,65}$	$G^{(46)}_{8,65}$	$G^{(47)}_{8,65}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G^{(48)}_{8,65}$	$G^{(49)}_{8,65}$	$G^{(50)}_{8,65}$	$G^{(51)}_{8,65}$	$G^{(52)}_{8,65}$	$G^{(53)}_{8,65}$	$G^{(54)}_{8,65}$	$G^{(55)}_{8,65}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G^{(56)}_{8,65}$	$G^{(57)}_{8,65}$	$G^{(58)}_{8,65}$	$G^{(59)}_{8,65}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{8,66}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([1, 2, 0]),   # b
  Vertex([6, 4, 7]),   # c
  Vertex([4, 6, 5]),   # d
  Vertex([3, 7, 5]),   # e
])
```

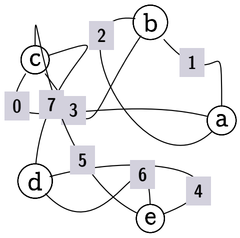
Boundary cycles

$$\alpha = ({}^{2}b^{0} \to {}^{0}a^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{1}b^{2})$$
$$\gamma = ({}^{0}e^{1} \to {}^{2}a^{3} \to {}^{2}c^{0} \to {}^{3}a^{0} \to {}^{2}e^{0} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\delta = ({}^{0}d^{1} \to {}^{0}c^{1})$$
$$\epsilon = ({}^{2}d^{0} \to {}^{1}e^{2} \to {}^{1}c^{2})$$

Markings

Fatgraph $G_{8,66}$ only has the identity automorphism, so the marked fatgraphs $G_{8,66}^{(0)}$ to $G_{8,66}^{(120)}$ are formed by decorating boundary cycles of $G_{8,66}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,67}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([2, 3, 1]),   # b
  Vertex([0, 3, 7, 5]),# c
  Vertex([6, 4, 7]),   # d
  Vertex([4, 6, 5]),   # e
])
```

Boundary cycles

$$\begin{aligned}
\alpha &= ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2}) \\
\beta &= ({}^{2}d^{0} \to {}^{1}c^{2} \to {}^{1}a^{2} \to {}^{0}b^{1} \to {}^{3}c^{0} \to {}^{1}e^{2}) \\
\gamma &= ({}^{2}a^{0} \to {}^{2}b^{0}) \\
\delta &= ({}^{2}c^{3} \to {}^{2}e^{0} \to {}^{1}d^{2}) \\
\epsilon &= ({}^{0}e^{1} \to {}^{0}d^{1})
\end{aligned}$$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	d	e	c	a	b	7	4	6	5	1	3	2	0	δ	β	ϵ	α	γ

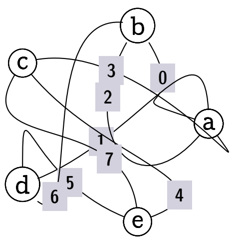
Markings

	$G_{8,67}^{(0)}$	$G_{8,67}^{(1)}$	$G_{8,67}^{(2)}$	$G_{8,67}^{(3)}$	$G_{8,67}^{(4)}$	$G_{8,67}^{(5)}$	$G_{8,67}^{(6)}$	$G_{8,67}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{8,67}^{(8)}$	$G_{8,67}^{(9)}$	$G_{8,67}^{(10)}$	$G_{8,67}^{(11)}$	$G_{8,67}^{(12)}$	$G_{8,67}^{(13)}$	$G_{8,67}^{(14)}$	$G_{8,67}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{8,67}^{(16)}$	$G_{8,67}^{(17)}$	$G_{8,67}^{(18)}$	$G_{8,67}^{(19)}$	$G_{8,67}^{(20)}$	$G_{8,67}^{(21)}$	$G_{8,67}^{(22)}$	$G_{8,67}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{8,67}^{(24)}$	$G_{8,67}^{(25)}$	$G_{8,67}^{(26)}$	$G_{8,67}^{(27)}$	$G_{8,67}^{(28)}$	$G_{8,67}^{(29)}$	$G_{8,67}^{(30)}$	$G_{8,67}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

(continued.)

	$G_{8,67}^{(32)}$	$G_{8,67}^{(33)}$	$G_{8,67}^{(34)}$	$G_{8,67}^{(35)}$	$G_{8,67}^{(36)}$	$G_{8,67}^{(37)}$	$G_{8,67}^{(38)}$	$G_{8,67}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	4	3	2	4	4	2	2	3
ϵ	0	0	4	2	0	0	3	2
	$G_{8,67}^{(40)}$	$G_{8,67}^{(41)}$	$G_{8,67}^{(42)}$	$G_{8,67}^{(43)}$	$G_{8,67}^{(44)}$	$G_{8,67}^{(45)}$	$G_{8,67}^{(46)}$	$G_{8,67}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	3	2	3	4	4	3	3	4
ϵ	0	0	4	3	1	1	4	3
	$G_{8,67}^{(48)}$	$G_{8,67}^{(49)}$	$G_{8,67}^{(50)}$	$G_{8,67}^{(51)}$	$G_{8,67}^{(52)}$	$G_{8,67}^{(53)}$	$G_{8,67}^{(54)}$	$G_{8,67}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	4	3	4	4	3	3	4	4
ϵ	0	0	1	0	1	0	2	1
	$G_{8,67}^{(56)}$	$G_{8,67}^{(57)}$	$G_{8,67}^{(58)}$	$G_{8,67}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	0	2	0	1				
δ	4	4	4	4				
ϵ	2	0	1	0				

The Fatgraph $G_{8,68}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2, 3]),# a
  Vertex([6, 2, 0]),   # b
  Vertex([7, 4, 3]),   # c
  Vertex([6, 1, 5]),   # d
  Vertex([4, 7, 5]),   # e
])
```

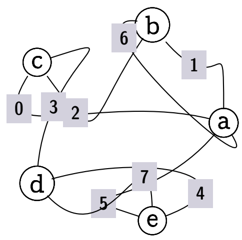
Boundary cycles

$$\begin{aligned}
\alpha &= ({}^0d^1 \to {}^2b^0 \to {}^0a^1)\\
\beta &= ({}^1a^2 \to {}^1b^2)\\
\gamma &= ({}^2a^3 \to {}^2d^0 \to {}^0b^1 \to {}^1e^2 \to {}^2c^0)\\
\delta &= ({}^3a^0 \to {}^1d^2 \to {}^1c^2 \to {}^2e^0)\\
\epsilon &= ({}^0e^1 \to {}^0c^1)
\end{aligned}$$

Markings

Fatgraph $G_{8,68}$ only has the identity automorphism, so the marked fatgraphs $G_{8,68}^{(0)}$ to $G_{8,68}^{(120)}$ are formed by decorating boundary cycles of $G_{8,68}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,69}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 5, 6]),# a
  Vertex([6, 2, 1]),   # b
  Vertex([0, 2, 3]),   # c
  Vertex([7, 4, 3]),   # d
  Vertex([4, 7, 5]),   # e
])
```

Boundary cycles

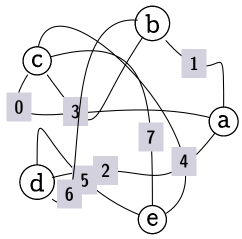
$$\begin{aligned}
\alpha &= ({}^0a^1 \to {}^0c^1 \to {}^1b^2)\\
\beta &= ({}^1a^2 \to {}^2c^0 \to {}^2e^0 \to {}^1d^2)\\
\gamma &= ({}^2a^3 \to {}^2d^0 \to {}^1e^2 \to {}^1c^2 \to {}^0b^1)\\
\delta &= ({}^3a^0 \to {}^2b^0)\\
\epsilon &= ({}^0e^1 \to {}^0d^1)
\end{aligned}$$

Markings

Fatgraph $G_{8,69}$ only has the identity automorphism, so the marked fatgraphs $G_{8,69}^{(0)}$ to $G_{8,69}^{(120)}$ are formed by decorating boundary cycles of $G_{8,69}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,70}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),   # a
  Vertex([6, 3, 1]),   # b
  Vertex([0, 3, 7, 4]),# c
  Vertex([6, 2, 5]),   # d
  Vertex([4, 7, 5]),   # e
])
```

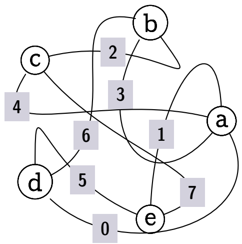
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^1d^2 \to {}^3c^0 \to {}^2e^0)$$
$$\gamma = ({}^2a^0 \to {}^2b^0 \to {}^0d^1)$$
$$\delta = ({}^2d^0 \to {}^1e^2 \to {}^1c^2 \to {}^0b^1)$$
$$\epsilon = ({}^0e^1 \to {}^2c^3)$$

Markings

Fatgraph $G_{8,70}$ only has the identity automorphism, so the marked fatgraphs $G_{8,70}^{(0)}$ to $G_{8,70}^{(120)}$ are formed by decorating boundary cycles of $G_{8,70}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{8,71}$ (30 orientable markings)




```
Fatgraph([
  Vertex([1, 4, 3, 0]),# a
  Vertex([6, 3, 2]),   # b
  Vertex([4, 7, 2]),   # c
  Vertex([0, 6, 5]),   # d
  Vertex([7, 1, 5]),   # e
])
```

Boundary cycles

$$\alpha = ({}^{0}e^{1} \to {}^{0}a^{1} \to {}^{0}c^{1})$$
$$\beta = ({}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}b^{2})$$
$$\gamma = ({}^{2}a^{3} \to {}^{0}d^{1} \to {}^{0}b^{1})$$
$$\delta = ({}^{3}a^{0} \to {}^{2}d^{0} \to {}^{1}e^{2})$$
$$\epsilon = ({}^{2}b^{0} \to {}^{1}d^{2} \to {}^{1}c^{2} \to {}^{2}e^{0})$$

Automorphisms

A_0	a	b	c	d	e	0	1	2	3	4	5	6	7	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	a	d	b	e	c	1	4	6	0	3	7	5	2	β	γ	δ	α	ϵ
$A_2{}^{\ddagger}$	a	e	d	c	b	4	3	5	1	0	2	7	6	γ	δ	α	β	ϵ
$A_3{}^{\ddagger}$	a	c	e	b	d	3	0	7	4	1	6	2	5	δ	α	β	γ	ϵ

Markings

	$G_{8,71}^{(0)}$	$G_{8,71}^{(1)}$	$G_{8,71}^{(2)}$	$G_{8,71}^{(3)}$	$G_{8,71}^{(4)}$	$G_{8,71}^{(5)}$	$G_{8,71}^{(6)}$	$G_{8,71}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{8,71}^{(8)}$	$G_{8,71}^{(9)}$	$G_{8,71}^{(10)}$	$G_{8,71}^{(11)}$	$G_{8,71}^{(12)}$	$G_{8,71}^{(13)}$	$G_{8,71}^{(14)}$	$G_{8,71}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2

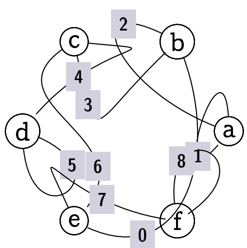
(continued.)

δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{8,71}^{(16)}$	$G_{8,71}^{(17)}$	$G_{8,71}^{(18)}$	$G_{8,71}^{(19)}$	$G_{8,71}^{(20)}$	$G_{8,71}^{(21)}$	$G_{8,71}^{(22)}$	$G_{8,71}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{8,71}^{(24)}$	$G_{8,71}^{(25)}$	$G_{8,71}^{(26)}$	$G_{8,71}^{(27)}$	$G_{8,71}^{(28)}$	$G_{8,71}^{(29)}$		
α	1	1	1	1	1	1		
β	2	2	3	3	4	4		
γ	3	4	2	4	2	3		
δ	4	3	4	2	3	2		
ϵ	0	0	0	0	0	0		

Fatgraphs with 9 edges / 6 vertices

There are 26 unmarked fatgraphs in this section, originating 4480 marked fatgraphs (2240 orientable, and 2240 nonorientable).

The Fatgraph $G_{9,0}$ (40 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),# a
  Vertex([2, 3, 0]),# b
  Vertex([6, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([0, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1f^2 \to {}^1a^2 \to {}^0a^1 \to {}^2f^0 \to {}^2c^0 \to {}^2e^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1e^2 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^0e^1 \to {}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^\ddagger$	d	c	e	f	b	a	3	5	4	6	7	8	0	2	1	α	δ	γ	ϵ	β
$A_2{}^\ddagger$	f	e	b	a	c	d	6	8	7	0	2	1	3	4	5	α	ϵ	γ	β	δ

Markings

	$G_{9,0}^{(0)}$	$G_{9,0}^{(1)}$	$G_{9,0}^{(2)}$	$G_{9,0}^{(3)}$	$G_{9,0}^{(4)}$	$G_{9,0}^{(5)}$	$G_{9,0}^{(6)}$	$G_{9,0}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,0}^{(8)}$	$G_{9,0}^{(9)}$	$G_{9,0}^{(10)}$	$G_{9,0}^{(11)}$	$G_{9,0}^{(12)}$	$G_{9,0}^{(13)}$	$G_{9,0}^{(14)}$	$G_{9,0}^{(15)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,0}^{(16)}$	$G_{9,0}^{(17)}$	$G_{9,0}^{(18)}$	$G_{9,0}^{(19)}$	$G_{9,0}^{(20)}$	$G_{9,0}^{(21)}$	$G_{9,0}^{(22)}$	$G_{9,0}^{(23)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	0	0
δ	3	4	1	4	1	3	3	4
ϵ	4	3	4	1	3	1	4	3
	$G_{9,0}^{(24)}$	$G_{9,0}^{(25)}$	$G_{9,0}^{(26)}$	$G_{9,0}^{(27)}$	$G_{9,0}^{(28)}$	$G_{9,0}^{(29)}$	$G_{9,0}^{(30)}$	$G_{9,0}^{(31)}$
α	3	3	3	3	3	3	3	3
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	4	4	0	0
δ	2	4	1	4	1	2	2	4
ϵ	4	2	4	1	2	1	4	2

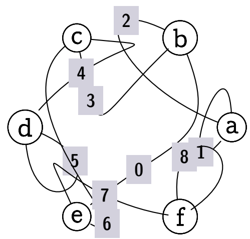
(continued.)

	$G_{9,0}^{(32)}$	$G_{9,0}^{(33)}$	$G_{9,0}^{(34)}$	$G_{9,0}^{(35)}$	$G_{9,0}^{(36)}$	$G_{9,0}^{(37)}$	$G_{9,0}^{(38)}$	$G_{9,0}^{(39)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	0	0
δ	2	3	1	3	1	2	2	3
ϵ	3	2	3	1	2	1	3	2

Differentials

$$D(G_{9,0}^{(0)}) = -G_{8,0}^{(12)} + G_{8,0}^{(60)}$$
$$D(G_{9,0}^{(1)}) = -G_{8,0}^{(13)} + G_{8,0}^{(61)}$$
$$D(G_{9,0}^{(2)}) = -G_{8,0}^{(14)} + G_{8,0}^{(62)}$$
$$D(G_{9,0}^{(3)}) = -G_{8,0}^{(15)} + G_{8,0}^{(63)}$$
$$D(G_{9,0}^{(4)}) = -G_{8,0}^{(16)} + G_{8,0}^{(64)}$$
$$D(G_{9,0}^{(5)}) = -G_{8,0}^{(17)} + G_{8,0}^{(65)}$$
$$D(G_{9,0}^{(6)}) = -G_{8,0}^{(24)} + G_{8,0}^{(66)}$$
$$D(G_{9,0}^{(7)}) = -G_{8,0}^{(25)} + G_{8,0}^{(67)}$$
$$D(G_{9,0}^{(8)}) = -G_{8,0}^{(26)} + G_{8,0}^{(68)}$$
$$D(G_{9,0}^{(9)}) = -G_{8,0}^{(27)} + G_{8,0}^{(69)}$$
$$D(G_{9,0}^{(10)}) = -G_{8,0}^{(28)} + G_{8,0}^{(70)}$$
$$D(G_{9,0}^{(11)}) = -G_{8,0}^{(29)} + G_{8,0}^{(71)}$$
$$D(G_{9,0}^{(12)}) = -G_{8,0}^{(36)}$$
$$D(G_{9,0}^{(13)}) = -G_{8,0}^{(37)}$$
$$D(G_{9,0}^{(14)}) = -G_{8,0}^{(38)}$$
$$D(G_{9,0}^{(15)}) = -G_{8,0}^{(39)}$$
$$D(G_{9,0}^{(16)}) = -G_{8,0}^{(40)}$$
$$D(G_{9,0}^{(17)}) = -G_{8,0}^{(41)}$$
$$D(G_{9,0}^{(18)}) = -G_{8,0}^{(48)}$$
$$D(G_{9,0}^{(19)}) = -G_{8,0}^{(49)}$$
$$D(G_{9,0}^{(20)}) = -G_{8,0}^{(50)}$$
$$D(G_{9,0}^{(21)}) = -G_{8,0}^{(51)}$$
$$D(G_{9,0}^{(22)}) = -G_{8,0}^{(52)}$$
$$D(G_{9,0}^{(23)}) = -G_{8,0}^{(53)}$$
$$D(G_{9,0}^{(24)}) = -G_{8,0}^{(0)}$$
$$D(G_{9,0}^{(25)}) = -G_{8,0}^{(1)}$$
$$D(G_{9,0}^{(26)}) = -G_{8,0}^{(2)}$$
$$D(G_{9,0}^{(27)}) = -G_{8,0}^{(3)}$$
$$D(G_{9,0}^{(28)}) = -G_{8,0}^{(4)}$$
$$D(G_{9,0}^{(29)}) = -G_{8,0}^{(5)}$$
$$D(G_{9,0}^{(30)}) = +G_{8,0}^{(25)}$$
$$D(G_{9,0}^{(31)}) = +G_{8,0}^{(24)}$$
$$D(G_{9,0}^{(32)}) = -G_{8,0}^{(30)}$$
$$D(G_{9,0}^{(33)}) = -G_{8,0}^{(31)}$$
$$D(G_{9,0}^{(34)}) = -G_{8,0}^{(32)}$$
$$D(G_{9,0}^{(35)}) = -G_{8,0}^{(33)}$$
$$D(G_{9,0}^{(36)}) = +G_{8,0}^{(37)}$$
$$D(G_{9,0}^{(37)}) = +G_{8,0}^{(36)}$$
$$D(G_{9,0}^{(38)}) = -G_{8,0}^{(42)}$$
$$D(G_{9,0}^{(39)}) = -G_{8,0}^{(43)}$$

The Fatgraph $G_{9,1}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),# a
  Vertex([2, 3, 0]),# b
  Vertex([6, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([6, 0, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0e^1 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^1f^2 \to {}^2f^0 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,1}$ only has the identity automorphism, so the marked fatgraphs $G_{9,1}^{(0)}$ to $G_{9,1}^{(120)}$ are formed by decorating boundary cycles of $G_{9,1}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

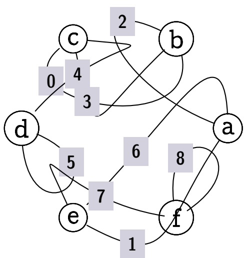
Differentials

$$D(G_{9,1}^{(0)}) = -G_{8,0}^{(44)}$$
$$D(G_{9,1}^{(1)}) = -G_{8,0}^{(45)}$$
$$D(G_{9,1}^{(2)}) = +G_{8,0}^{(49)}$$
$$D(G_{9,1}^{(3)}) = +G_{8,0}^{(48)}$$
$$D(G_{9,1}^{(4)}) = -G_{8,0}^{(54)}$$
$$D(G_{9,1}^{(5)}) = -G_{8,0}^{(55)}$$
$$D(G_{9,1}^{(6)}) = -G_{8,0}^{(56)}$$
$$D(G_{9,1}^{(7)}) = -G_{8,0}^{(57)}$$
$$D(G_{9,1}^{(8)}) = +G_{8,0}^{(1)}$$
$$D(G_{9,1}^{(9)}) = +G_{8,0}^{(0)}$$
$$D(G_{9,1}^{(10)}) = -G_{8,0}^{(6)}$$
$$D(G_{9,1}^{(11)}) = -G_{8,0}^{(7)}$$
$$D(G_{9,1}^{(12)}) = -G_{8,0}^{(8)}$$
$$D(G_{9,1}^{(13)}) = -G_{8,0}^{(9)}$$
$$D(G_{9,1}^{(14)}) = +G_{8,0}^{(13)}$$
$$D(G_{9,1}^{(15)}) = +G_{8,0}^{(12)}$$
$$D(G_{9,1}^{(16)}) = -G_{8,0}^{(18)}$$
$$D(G_{9,1}^{(17)}) = -G_{8,0}^{(19)}$$
$$D(G_{9,1}^{(18)}) = -G_{8,0}^{(20)}$$
$$D(G_{9,1}^{(19)}) = -G_{8,0}^{(21)}$$
$$D(G_{9,1}^{(20)}) = +G_{8,0}^{(39)}$$
$$D(G_{9,1}^{(21)}) = +G_{8,0}^{(38)}$$
$$D(G_{9,1}^{(22)}) = +G_{8,0}^{(43)}$$
$$D(G_{9,1}^{(23)}) = +G_{8,0}^{(42)}$$

$$D(G_{9,1}^{(24)}) = -G_{8,0}^{(46)}$$
$$D(G_{9,1}^{(25)}) = -G_{8,0}^{(47)}$$
$$D(G_{9,1}^{(26)}) = +G_{8,0}^{(51)}$$
$$D(G_{9,1}^{(27)}) = +G_{8,0}^{(50)}$$
$$D(G_{9,1}^{(28)}) = +G_{8,0}^{(55)}$$
$$D(G_{9,1}^{(29)}) = +G_{8,0}^{(54)}$$
$$D(G_{9,1}^{(30)}) = -G_{8,0}^{(58)}$$
$$D(G_{9,1}^{(31)}) = -G_{8,0}^{(59)}$$
$$D(G_{9,1}^{(32)}) = +G_{8,0}^{(3)}$$
$$D(G_{9,1}^{(33)}) = +G_{8,0}^{(2)}$$
$$D(G_{9,1}^{(34)}) = +G_{8,0}^{(7)}$$
$$D(G_{9,1}^{(35)}) = +G_{8,0}^{(6)}$$
$$D(G_{9,1}^{(36)}) = -G_{8,0}^{(10)}$$
$$D(G_{9,1}^{(37)}) = -G_{8,0}^{(11)}$$
$$D(G_{9,1}^{(38)}) = +G_{8,0}^{(15)}$$
$$D(G_{9,1}^{(39)}) = +G_{8,0}^{(14)}$$
$$D(G_{9,1}^{(40)}) = +G_{8,0}^{(19)}$$
$$D(G_{9,1}^{(41)}) = +G_{8,0}^{(18)}$$
$$D(G_{9,1}^{(42)}) = -G_{8,0}^{(22)}$$
$$D(G_{9,1}^{(43)}) = -G_{8,0}^{(23)}$$
$$D(G_{9,1}^{(44)}) = +G_{8,0}^{(27)}$$
$$D(G_{9,1}^{(45)}) = +G_{8,0}^{(26)}$$
$$D(G_{9,1}^{(46)}) = +G_{8,0}^{(31)}$$
$$D(G_{9,1}^{(47)}) = +G_{8,0}^{(30)}$$
$$D(G_{9,1}^{(48)}) = -G_{8,0}^{(34)}$$
$$D(G_{9,1}^{(49)}) = -G_{8,0}^{(35)}$$
$$D(G_{9,1}^{(50)}) = +G_{8,0}^{(53)}$$
$$D(G_{9,1}^{(51)}) = +G_{8,0}^{(52)}$$
$$D(G_{9,1}^{(52)}) = +G_{8,0}^{(57)}$$
$$D(G_{9,1}^{(53)}) = +G_{8,0}^{(56)}$$
$$D(G_{9,1}^{(54)}) = +G_{8,0}^{(59)}$$
$$D(G_{9,1}^{(55)}) = +G_{8,0}^{(58)}$$
$$D(G_{9,1}^{(56)}) = +G_{8,0}^{(5)}$$
$$D(G_{9,1}^{(57)}) = +G_{8,0}^{(4)}$$
$$D(G_{9,1}^{(58)}) = +G_{8,0}^{(9)}$$
$$D(G_{9,1}^{(59)}) = +G_{8,0}^{(8)}$$
$$D(G_{9,1}^{(60)}) = +G_{8,0}^{(11)}$$
$$D(G_{9,1}^{(61)}) = +G_{8,0}^{(10)}$$
$$D(G_{9,1}^{(62)}) = +G_{8,0}^{(17)}$$
$$D(G_{9,1}^{(63)}) = +G_{8,0}^{(16)}$$
$$D(G_{9,1}^{(64)}) = +G_{8,0}^{(21)}$$
$$D(G_{9,1}^{(65)}) = +G_{8,0}^{(20)}$$
$$D(G_{9,1}^{(66)}) = +G_{8,0}^{(23)}$$
$$D(G_{9,1}^{(67)}) = +G_{8,0}^{(22)}$$
$$D(G_{9,1}^{(68)}) = +G_{8,0}^{(29)}$$
$$D(G_{9,1}^{(69)}) = +G_{8,0}^{(28)}$$
$$D(G_{9,1}^{(70)}) = +G_{8,0}^{(33)}$$
$$D(G_{9,1}^{(71)}) = +G_{8,0}^{(32)}$$
$$D(G_{9,1}^{(72)}) = +G_{8,0}^{(35)}$$
$$D(G_{9,1}^{(73)}) = +G_{8,0}^{(34)}$$
$$D(G_{9,1}^{(74)}) = +G_{8,0}^{(41)}$$
$$D(G_{9,1}^{(75)}) = +G_{8,0}^{(40)}$$
$$D(G_{9,1}^{(76)}) = +G_{8,0}^{(45)}$$
$$D(G_{9,1}^{(77)}) = +G_{8,0}^{(44)}$$
$$D(G_{9,1}^{(78)}) = +G_{8,0}^{(47)}$$
$$D(G_{9,1}^{(79)}) = +G_{8,0}^{(46)}$$
$$D(G_{9,1}^{(80)}) = -G_{8,0}^{(0)}$$
$$D(G_{9,1}^{(81)}) = -G_{8,0}^{(1)}$$
$$D(G_{9,1}^{(82)}) = -G_{8,0}^{(2)}$$
$$D(G_{9,1}^{(83)}) = -G_{8,0}^{(3)}$$
$$D(G_{9,1}^{(84)}) = -G_{8,0}^{(4)}$$
$$D(G_{9,1}^{(85)}) = -G_{8,0}^{(5)}$$
$$D(G_{9,1}^{(86)}) = +G_{8,0}^{(1)}$$
$$D(G_{9,1}^{(87)}) = +G_{8,0}^{(0)}$$
$$D(G_{9,1}^{(88)}) = -G_{8,0}^{(6)}$$
$$D(G_{9,1}^{(89)}) = -G_{8,0}^{(7)}$$
$$D(G_{9,1}^{(90)}) = -G_{8,0}^{(8)}$$
$$D(G_{9,1}^{(91)}) = -G_{8,0}^{(9)}$$
$$D(G_{9,1}^{(92)}) = +G_{8,0}^{(3)}$$
$$D(G_{9,1}^{(93)}) = +G_{8,0}^{(2)}$$
$$D(G_{9,1}^{(94)}) = +G_{8,0}^{(7)}$$
$$D(G_{9,1}^{(95)}) = +G_{8,0}^{(6)}$$
$$D(G_{9,1}^{(96)}) = -G_{8,0}^{(10)}$$
$$D(G_{9,1}^{(97)}) = -G_{8,0}^{(11)}$$
$$D(G_{9,1}^{(98)}) = +G_{8,0}^{(5)}$$
$$D(G_{9,1}^{(99)}) = +G_{8,0}^{(4)}$$

$D(G_{9,1}^{(100)}) = +G_{8,0}^{(9)}$
$D(G_{9,1}^{(101)}) = +G_{8,0}^{(8)}$
$D(G_{9,1}^{(102)}) = +G_{8,0}^{(11)}$
$D(G_{9,1}^{(103)}) = +G_{8,0}^{(10)}$
$D(G_{9,1}^{(104)}) = -G_{8,0}^{(12)}$
$D(G_{9,1}^{(105)}) = -G_{8,0}^{(13)}$
$D(G_{9,1}^{(106)}) = -G_{8,0}^{(14)}$
$D(G_{9,1}^{(107)}) = -G_{8,0}^{(15)}$
$D(G_{9,1}^{(108)}) = -G_{8,0}^{(16)}$
$D(G_{9,1}^{(109)}) = -G_{8,0}^{(17)}$
$D(G_{9,1}^{(110)}) = +G_{8,0}^{(13)}$
$D(G_{9,1}^{(111)}) = +G_{8,0}^{(12)}$
$D(G_{9,1}^{(112)}) = -G_{8,0}^{(18)}$
$D(G_{9,1}^{(113)}) = -G_{8,0}^{(19)}$
$D(G_{9,1}^{(114)}) = -G_{8,0}^{(20)}$
$D(G_{9,1}^{(115)}) = -G_{8,0}^{(21)}$
$D(G_{9,1}^{(116)}) = +G_{8,0}^{(15)}$
$D(G_{9,1}^{(117)}) = +G_{8,0}^{(14)}$
$D(G_{9,1}^{(118)}) = +G_{8,0}^{(19)}$
$D(G_{9,1}^{(119)}) = +G_{8,0}^{(18)}$

The Fatgraph $G_{9,2}$ (120 orientable markings)




```
Fatgraph([
  Vertex([6, 2, 1]),# a
  Vertex([2, 3, 0]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([1, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0e^1 \to {}^1a^2 \to {}^0a^1 \to {}^2c^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1d^2)$$
$$\beta = ({}^2a^0 \to {}^1f^2 \to {}^1e^2 \to {}^2e^0 \to {}^2f^0)$$
$$\gamma = ({}^0c^1 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Markings

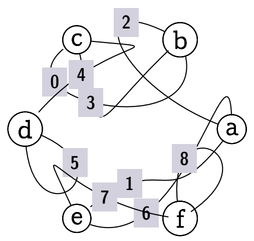
Fatgraph $G_{9,2}$ only has the identity automorphism, so the marked fatgraphs $G_{9,2}^{(0)}$ to $G_{9,2}^{(120)}$ are formed by decorating boundary cycles of $G_{9,2}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{9,2}^{(0)}) = -G_{8,0}^{(22)}$$
$$D(G_{9,2}^{(1)}) = -G_{8,0}^{(23)}$$
$$D(G_{9,2}^{(2)}) = +G_{8,0}^{(17)}$$
$$D(G_{9,2}^{(3)}) = +G_{8,0}^{(16)}$$
$$D(G_{9,2}^{(4)}) = +G_{8,0}^{(21)}$$
$$D(G_{9,2}^{(5)}) = +G_{8,0}^{(20)}$$
$$D(G_{9,2}^{(6)}) = +G_{8,0}^{(23)}$$
$$D(G_{9,2}^{(7)}) = +G_{8,0}^{(22)}$$
$$D(G_{9,2}^{(8)}) = -G_{8,0}^{(24)}$$
$$D(G_{9,2}^{(9)}) = -G_{8,0}^{(25)}$$
$$D(G_{9,2}^{(10)}) = -G_{8,0}^{(26)}$$
$$D(G_{9,2}^{(11)}) = -G_{8,0}^{(27)}$$
$$D(G_{9,2}^{(12)}) = -G_{8,0}^{(28)}$$
$$D(G_{9,2}^{(13)}) = -G_{8,0}^{(29)}$$
$$D(G_{9,2}^{(14)}) = +G_{8,0}^{(25)}$$
$$D(G_{9,2}^{(15)}) = +G_{8,0}^{(24)}$$
$$D(G_{9,2}^{(16)}) = -G_{8,0}^{(30)}$$
$$D(G_{9,2}^{(17)}) = -G_{8,0}^{(31)}$$
$$D(G_{9,2}^{(18)}) = -G_{8,0}^{(32)}$$
$$D(G_{9,2}^{(19)}) = -G_{8,0}^{(33)}$$
$$D(G_{9,2}^{(20)}) = +G_{8,0}^{(27)}$$
$$D(G_{9,2}^{(21)}) = +G_{8,0}^{(26)}$$
$$D(G_{9,2}^{(22)}) = +G_{8,0}^{(31)}$$
$$D(G_{9,2}^{(23)}) = +G_{8,0}^{(30)}$$
$$D(G_{9,2}^{(24)}) = -G_{8,0}^{(34)}$$
$$D(G_{9,2}^{(25)}) = -G_{8,0}^{(35)}$$
$$D(G_{9,2}^{(26)}) = +G_{8,0}^{(29)}$$
$$D(G_{9,2}^{(27)}) = +G_{8,0}^{(28)}$$
$$D(G_{9,2}^{(28)}) = +G_{8,0}^{(33)}$$
$$D(G_{9,2}^{(29)}) = +G_{8,0}^{(32)}$$
$$D(G_{9,2}^{(30)}) = +G_{8,0}^{(35)}$$
$$D(G_{9,2}^{(31)}) = +G_{8,0}^{(34)}$$
$$D(G_{9,2}^{(32)}) = -G_{8,0}^{(36)}$$
$$D(G_{9,2}^{(33)}) = -G_{8,0}^{(37)}$$
$$D(G_{9,2}^{(34)}) = -G_{8,0}^{(38)}$$
$$D(G_{9,2}^{(35)}) = -G_{8,0}^{(39)}$$
$$D(G_{9,2}^{(36)}) = -G_{8,0}^{(40)}$$
$$D(G_{9,2}^{(37)}) = -G_{8,0}^{(41)}$$
$$D(G_{9,2}^{(38)}) = +G_{8,0}^{(37)}$$
$$D(G_{9,2}^{(39)}) = +G_{8,0}^{(36)}$$
$$D(G_{9,2}^{(40)}) = -G_{8,0}^{(42)}$$
$$D(G_{9,2}^{(41)}) = -G_{8,0}^{(43)}$$
$$D(G_{9,2}^{(42)}) = -G_{8,0}^{(44)}$$
$$D(G_{9,2}^{(43)}) = -G_{8,0}^{(45)}$$
$$D(G_{9,2}^{(44)}) = +G_{8,0}^{(39)}$$
$$D(G_{9,2}^{(45)}) = +G_{8,0}^{(38)}$$
$$D(G_{9,2}^{(46)}) = +G_{8,0}^{(43)}$$
$$D(G_{9,2}^{(47)}) = +G_{8,0}^{(42)}$$
$$D(G_{9,2}^{(48)}) = -G_{8,0}^{(46)}$$
$$D(G_{9,2}^{(49)}) = -G_{8,0}^{(47)}$$
$$D(G_{9,2}^{(50)}) = +G_{8,0}^{(41)}$$
$$D(G_{9,2}^{(51)}) = +G_{8,0}^{(40)}$$
$$D(G_{9,2}^{(52)}) = +G_{8,0}^{(45)}$$
$$D(G_{9,2}^{(53)}) = +G_{8,0}^{(44)}$$
$$D(G_{9,2}^{(54)}) = +G_{8,0}^{(47)}$$
$$D(G_{9,2}^{(55)}) = +G_{8,0}^{(46)}$$
$$D(G_{9,2}^{(56)}) = -G_{8,0}^{(48)}$$
$$D(G_{9,2}^{(57)}) = -G_{8,0}^{(49)}$$
$$D(G_{9,2}^{(58)}) = -G_{8,0}^{(50)}$$
$$D(G_{9,2}^{(59)}) = -G_{8,0}^{(51)}$$
$$D(G_{9,2}^{(60)}) = -G_{8,0}^{(52)}$$
$$D(G_{9,2}^{(61)}) = -G_{8,0}^{(53)}$$
$$D(G_{9,2}^{(62)}) = +G_{8,0}^{(49)}$$
$$D(G_{9,2}^{(63)}) = +G_{8,0}^{(48)}$$
$$D(G_{9,2}^{(64)}) = -G_{8,0}^{(54)}$$
$$D(G_{9,2}^{(65)}) = -G_{8,0}^{(55)}$$
$$D(G_{9,2}^{(66)}) = -G_{8,0}^{(56)}$$
$$D(G_{9,2}^{(67)}) = -G_{8,0}^{(57)}$$
$$D(G_{9,2}^{(68)}) = +G_{8,0}^{(51)}$$
$$D(G_{9,2}^{(69)}) = +G_{8,0}^{(50)}$$
$$D(G_{9,2}^{(70)}) = +G_{8,0}^{(55)}$$
$$D(G_{9,2}^{(71)}) = +G_{8,0}^{(54)}$$
$$D(G_{9,2}^{(72)}) = -G_{8,0}^{(58)}$$
$$D(G_{9,2}^{(73)}) = -G_{8,0}^{(59)}$$
$$D(G_{9,2}^{(74)}) = +G_{8,0}^{(53)}$$
$$D(G_{9,2}^{(75)}) = +G_{8,0}^{(52)}$$

$$D(G_{9,2}^{(76)}) = +G_{8,0}^{(57)}$$
$$D(G_{9,2}^{(77)}) = +G_{8,0}^{(56)}$$
$$D(G_{9,2}^{(78)}) = +G_{8,0}^{(59)}$$
$$D(G_{9,2}^{(79)}) = +G_{8,0}^{(58)}$$
$$D(G_{9,2}^{(104)}) = -G_{8,0}^{(60)}$$
$$D(G_{9,2}^{(105)}) = -G_{8,0}^{(61)}$$
$$D(G_{9,2}^{(106)}) = -G_{8,0}^{(62)}$$
$$D(G_{9,2}^{(107)}) = -G_{8,0}^{(63)}$$
$$D(G_{9,2}^{(108)}) = -G_{8,0}^{(64)}$$
$$D(G_{9,2}^{(109)}) = -G_{8,0}^{(65)}$$

The Fatgraph $G_{9,3}$ (60 orientable markings)




```
Fatgraph([
  Vertex([6, 2, 1]),# a
  Vertex([2, 3, 0]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([6, 1, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$\alpha = ({}^2d^0 \to {}^1f^2 \to {}^1a^2 \to {}^0a^1 \to {}^2f^0 \to {}^2c^0 \to {}^2e^0 \to {}^1c^2 \to {}^2b^0 \to {}^0b^1 \to {}^1e^2 \to {}^1d^2)$

$\beta = ({}^0e^1 \to {}^2a^0)$

$\gamma = ({}^0c^1 \to {}^1b^2)$

$\delta = ({}^0d^1)$

$\epsilon = ({}^0f^1)$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
A_1 ‡	b	a	e	f	c	d	6	3	2	1	7	8	0	4	5	α	γ	β	ϵ	δ

Markings

	$G_{9,3}^{(0)}$	$G_{9,3}^{(1)}$	$G_{9,3}^{(2)}$	$G_{9,3}^{(3)}$	$G_{9,3}^{(4)}$	$G_{9,3}^{(5)}$	$G_{9,3}^{(6)}$	$G_{9,3}^{(7)}$
α	0	0	0	0	0	0	0	0

(continued.)

β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{9,3}^{(8)}$	$G_{9,3}^{(9)}$	$G_{9,3}^{(10)}$	$G_{9,3}^{(11)}$	$G_{9,3}^{(12)}$	$G_{9,3}^{(13)}$	$G_{9,3}^{(14)}$	$G_{9,3}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{9,3}^{(16)}$	$G_{9,3}^{(17)}$	$G_{9,3}^{(18)}$	$G_{9,3}^{(19)}$	$G_{9,3}^{(20)}$	$G_{9,3}^{(21)}$	$G_{9,3}^{(22)}$	$G_{9,3}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{9,3}^{(24)}$	$G_{9,3}^{(25)}$	$G_{9,3}^{(26)}$	$G_{9,3}^{(27)}$	$G_{9,3}^{(28)}$	$G_{9,3}^{(29)}$	$G_{9,3}^{(30)}$	$G_{9,3}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0
	$G_{9,3}^{(32)}$	$G_{9,3}^{(33)}$	$G_{9,3}^{(34)}$	$G_{9,3}^{(35)}$	$G_{9,3}^{(36)}$	$G_{9,3}^{(37)}$	$G_{9,3}^{(38)}$	$G_{9,3}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{9,3}^{(40)}$	$G_{9,3}^{(41)}$	$G_{9,3}^{(42)}$	$G_{9,3}^{(43)}$	$G_{9,3}^{(44)}$	$G_{9,3}^{(45)}$	$G_{9,3}^{(46)}$	$G_{9,3}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{9,3}^{(48)}$	$G_{9,3}^{(49)}$	$G_{9,3}^{(50)}$	$G_{9,3}^{(51)}$	$G_{9,3}^{(52)}$	$G_{9,3}^{(53)}$	$G_{9,3}^{(54)}$	$G_{9,3}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{9,3}^{(56)}$	$G_{9,3}^{(57)}$	$G_{9,3}^{(58)}$	$G_{9,3}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				

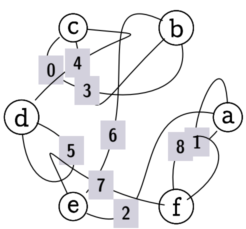
(continued.)

δ	0	2	0	1
ϵ	2	0	1	0

Differentials

$$D(G_{9,3}^{(8)}) = -G_{8,0}^{(66)}$$
$$D(G_{9,3}^{(9)}) = -G_{8,0}^{(67)}$$
$$D(G_{9,3}^{(10)}) = -G_{8,0}^{(68)}$$
$$D(G_{9,3}^{(11)}) = -G_{8,0}^{(69)}$$
$$D(G_{9,3}^{(12)}) = -G_{8,0}^{(70)}$$
$$D(G_{9,3}^{(13)}) = -G_{8,0}^{(71)}$$

The Fatgraph $G_{9,4}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),# a
  Vertex([6, 3, 0]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([2, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$\alpha = ({}^0e^1 \to {}^2d^0 \to {}^1f^2 \to {}^1a^2 \to {}^0a^1 \to {}^2f^0 \to {}^0b^1 \to {}^2e^0 \to {}^1c^2 \to {}^2b^0 \to {}^2c^0 \to {}^1e^2 \to {}^1d^2)$

$\beta = ({}^2a^0)$

$\gamma = ({}^0c^1 \to {}^1b^2)$

$\delta = ({}^0d^1)$

$\epsilon = ({}^0f^1)$

Markings

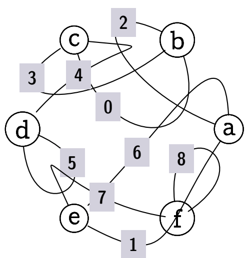
Fatgraph $G_{9,4}$ only has the identity automorphism, so the marked fatgraphs $G_{9,4}^{(0)}$ to $G_{9,4}^{(120)}$ are formed by decorating boundary cycles of $G_{9,4}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

Differentials

$$D(G_{9,4}^{(20)}) = +G_{8,0}^{(7)}$$
$$D(G_{9,4}^{(21)}) = +G_{8,0}^{(9)}$$
$$D(G_{9,4}^{(22)}) = -G_{8,0}^{(6)}$$
$$D(G_{9,4}^{(23)}) = +G_{8,0}^{(11)}$$
$$D(G_{9,4}^{(24)}) = -G_{8,0}^{(8)}$$
$$D(G_{9,4}^{(25)}) = -G_{8,0}^{(10)}$$
$$D(G_{9,4}^{(26)}) = +G_{8,0}^{(3)}$$
$$D(G_{9,4}^{(27)}) = +G_{8,0}^{(5)}$$
$$D(G_{9,4}^{(28)}) = -G_{8,0}^{(2)}$$
$$D(G_{9,4}^{(29)}) = +G_{8,0}^{(10)}$$
$$D(G_{9,4}^{(30)}) = -G_{8,0}^{(4)}$$
$$D(G_{9,4}^{(31)}) = -G_{8,0}^{(11)}$$
$$D(G_{9,4}^{(32)}) = +G_{8,0}^{(1)}$$
$$D(G_{9,4}^{(33)}) = +G_{8,0}^{(4)}$$
$$D(G_{9,4}^{(34)}) = -G_{8,0}^{(0)}$$
$$D(G_{9,4}^{(35)}) = +G_{8,0}^{(8)}$$
$$D(G_{9,4}^{(36)}) = -G_{8,0}^{(5)}$$
$$D(G_{9,4}^{(37)}) = -G_{8,0}^{(9)}$$
$$D(G_{9,4}^{(38)}) = +G_{8,0}^{(0)}$$
$$D(G_{9,4}^{(39)}) = +G_{8,0}^{(2)}$$
$$D(G_{9,4}^{(40)}) = -G_{8,0}^{(1)}$$
$$D(G_{9,4}^{(41)}) = +G_{8,0}^{(6)}$$
$$D(G_{9,4}^{(42)}) = -G_{8,0}^{(3)}$$
$$D(G_{9,4}^{(43)}) = -G_{8,0}^{(7)}$$
$$D(G_{9,4}^{(44)}) = +G_{8,0}^{(19)}$$
$$D(G_{9,4}^{(45)}) = +G_{8,0}^{(21)}$$
$$D(G_{9,4}^{(46)}) = -G_{8,0}^{(18)}$$
$$D(G_{9,4}^{(47)}) = +G_{8,0}^{(23)}$$
$$D(G_{9,4}^{(48)}) = -G_{8,0}^{(20)}$$
$$D(G_{9,4}^{(49)}) = -G_{8,0}^{(22)}$$
$$D(G_{9,4}^{(50)}) = +G_{8,0}^{(15)}$$
$$D(G_{9,4}^{(51)}) = +G_{8,0}^{(17)}$$
$$D(G_{9,4}^{(52)}) = -G_{8,0}^{(14)}$$
$$D(G_{9,4}^{(53)}) = +G_{8,0}^{(22)}$$
$$D(G_{9,4}^{(54)}) = -G_{8,0}^{(16)}$$
$$D(G_{9,4}^{(55)}) = -G_{8,0}^{(23)}$$
$$D(G_{9,4}^{(56)}) = +G_{8,0}^{(13)}$$
$$D(G_{9,4}^{(57)}) = +G_{8,0}^{(16)}$$
$$D(G_{9,4}^{(58)}) = -G_{8,0}^{(12)}$$
$$D(G_{9,4}^{(59)}) = +G_{8,0}^{(20)}$$
$$D(G_{9,4}^{(60)}) = -G_{8,0}^{(17)}$$
$$D(G_{9,4}^{(61)}) = -G_{8,0}^{(21)}$$
$$D(G_{9,4}^{(62)}) = +G_{8,0}^{(12)}$$
$$D(G_{9,4}^{(63)}) = +G_{8,0}^{(14)}$$
$$D(G_{9,4}^{(64)}) = -G_{8,0}^{(13)}$$
$$D(G_{9,4}^{(65)}) = +G_{8,0}^{(18)}$$
$$D(G_{9,4}^{(66)}) = -G_{8,0}^{(15)}$$
$$D(G_{9,4}^{(67)}) = -G_{8,0}^{(19)}$$
$$D(G_{9,4}^{(68)}) = +G_{8,0}^{(31)}$$
$$D(G_{9,4}^{(69)}) = +G_{8,0}^{(33)}$$
$$D(G_{9,4}^{(70)}) = -G_{8,0}^{(30)}$$
$$D(G_{9,4}^{(71)}) = +G_{8,0}^{(35)}$$
$$D(G_{9,4}^{(72)}) = -G_{8,0}^{(32)}$$
$$D(G_{9,4}^{(73)}) = -G_{8,0}^{(34)}$$
$$D(G_{9,4}^{(74)}) = +G_{8,0}^{(27)}$$
$$D(G_{9,4}^{(75)}) = +G_{8,0}^{(29)}$$
$$D(G_{9,4}^{(76)}) = -G_{8,0}^{(26)}$$
$$D(G_{9,4}^{(77)}) = +G_{8,0}^{(34)}$$
$$D(G_{9,4}^{(78)}) = -G_{8,0}^{(28)}$$
$$D(G_{9,4}^{(79)}) = -G_{8,0}^{(35)}$$
$$D(G_{9,4}^{(80)}) = +G_{8,0}^{(25)}$$
$$D(G_{9,4}^{(81)}) = +G_{8,0}^{(28)}$$
$$D(G_{9,4}^{(82)}) = -G_{8,0}^{(24)}$$
$$D(G_{9,4}^{(83)}) = +G_{8,0}^{(32)}$$
$$D(G_{9,4}^{(84)}) = -G_{8,0}^{(29)}$$
$$D(G_{9,4}^{(85)}) = -G_{8,0}^{(33)}$$
$$D(G_{9,4}^{(86)}) = +G_{8,0}^{(24)}$$
$$D(G_{9,4}^{(87)}) = +G_{8,0}^{(26)}$$
$$D(G_{9,4}^{(88)}) = -G_{8,0}^{(25)}$$
$$D(G_{9,4}^{(89)}) = +G_{8,0}^{(30)}$$
$$D(G_{9,4}^{(90)}) = -G_{8,0}^{(27)}$$
$$D(G_{9,4}^{(91)}) = -G_{8,0}^{(31)}$$
$$D(G_{9,4}^{(92)}) = +G_{8,0}^{(43)}$$
$$D(G_{9,4}^{(93)}) = +G_{8,0}^{(45)}$$
$$D(G_{9,4}^{(94)}) = -G_{8,0}^{(42)}$$
$$D(G_{9,4}^{(95)}) = +G_{8,0}^{(47)}$$

$$
\begin{aligned}
D(G_{9,4}^{(96)}) &= -G_{8,0}^{(44)} & D(G_{9,4}^{(108)}) &= -G_{8,0}^{(41)}\\
D(G_{9,4}^{(97)}) &= -G_{8,0}^{(46)} & D(G_{9,4}^{(109)}) &= -G_{8,0}^{(45)}\\
D(G_{9,4}^{(98)}) &= +G_{8,0}^{(39)} & D(G_{9,4}^{(110)}) &= +G_{8,0}^{(36)}\\
D(G_{9,4}^{(99)}) &= +G_{8,0}^{(41)} & D(G_{9,4}^{(111)}) &= +G_{8,0}^{(38)}\\
D(G_{9,4}^{(100)}) &= -G_{8,0}^{(38)} & D(G_{9,4}^{(112)}) &= -G_{8,0}^{(37)}\\
D(G_{9,4}^{(101)}) &= +G_{8,0}^{(46)} & D(G_{9,4}^{(113)}) &= +G_{8,0}^{(42)}\\
D(G_{9,4}^{(102)}) &= -G_{8,0}^{(40)} & D(G_{9,4}^{(114)}) &= -G_{8,0}^{(39)}\\
D(G_{9,4}^{(103)}) &= -G_{8,0}^{(47)} & D(G_{9,4}^{(115)}) &= -G_{8,0}^{(43)}\\
D(G_{9,4}^{(104)}) &= +G_{8,0}^{(37)} & D(G_{9,4}^{(116)}) &= +G_{8,0}^{(55)}\\
D(G_{9,4}^{(105)}) &= +G_{8,0}^{(40)} & D(G_{9,4}^{(117)}) &= +G_{8,0}^{(57)}\\
D(G_{9,4}^{(106)}) &= -G_{8,0}^{(36)} & D(G_{9,4}^{(118)}) &= -G_{8,0}^{(54)}\\
D(G_{9,4}^{(107)}) &= +G_{8,0}^{(44)} & D(G_{9,4}^{(119)}) &= +G_{8,0}^{(59)}
\end{aligned}
$$

The Fatgraph $G_{9,5}$ (60 orientable markings)




```
Fatgraph([
  Vertex([6, 2, 1]),# a
  Vertex([2, 3, 0]),# b
  Vertex([3, 0, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([1, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$
\begin{aligned}
\alpha &= ({}^0e^1 \to {}^1a^2 \to {}^0a^1 \to {}^0b^1 \to {}^0c^1 \to {}^2b^0)\\
\beta &= ({}^2a^0 \to {}^1f^2 \to {}^1e^2 \to {}^2e^0 \to {}^2f^0)\\
\gamma &= ({}^2d^0 \to {}^2c^0 \to {}^1d^2 \to {}^1c^2 \to {}^1b^2)\\
\delta &= ({}^0d^1)\\
\epsilon &= ({}^0f^1)
\end{aligned}
$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^\ddagger$	b	a	e	f	c	d	6	3	2	1	7	8	0	4	5	α	γ	β	ϵ	δ

Markings

	$G_{9,5}^{(0)}$	$G_{9,5}^{(1)}$	$G_{9,5}^{(2)}$	$G_{9,5}^{(3)}$	$G_{9,5}^{(4)}$	$G_{9,5}^{(5)}$	$G_{9,5}^{(6)}$	$G_{9,5}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{9,5}^{(8)}$	$G_{9,5}^{(9)}$	$G_{9,5}^{(10)}$	$G_{9,5}^{(11)}$	$G_{9,5}^{(12)}$	$G_{9,5}^{(13)}$	$G_{9,5}^{(14)}$	$G_{9,5}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2
	$G_{9,5}^{(16)}$	$G_{9,5}^{(17)}$	$G_{9,5}^{(18)}$	$G_{9,5}^{(19)}$	$G_{9,5}^{(20)}$	$G_{9,5}^{(21)}$	$G_{9,5}^{(22)}$	$G_{9,5}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{9,5}^{(24)}$	$G_{9,5}^{(25)}$	$G_{9,5}^{(26)}$	$G_{9,5}^{(27)}$	$G_{9,5}^{(28)}$	$G_{9,5}^{(29)}$	$G_{9,5}^{(30)}$	$G_{9,5}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0
	$G_{9,5}^{(32)}$	$G_{9,5}^{(33)}$	$G_{9,5}^{(34)}$	$G_{9,5}^{(35)}$	$G_{9,5}^{(36)}$	$G_{9,5}^{(37)}$	$G_{9,5}^{(38)}$	$G_{9,5}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{9,5}^{(40)}$	$G_{9,5}^{(41)}$	$G_{9,5}^{(42)}$	$G_{9,5}^{(43)}$	$G_{9,5}^{(44)}$	$G_{9,5}^{(45)}$	$G_{9,5}^{(46)}$	$G_{9,5}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{9,5}^{(48)}$	$G_{9,5}^{(49)}$	$G_{9,5}^{(50)}$	$G_{9,5}^{(51)}$	$G_{9,5}^{(52)}$	$G_{9,5}^{(53)}$	$G_{9,5}^{(54)}$	$G_{9,5}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2

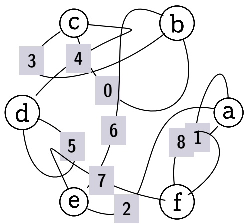
(continued.)

δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{9,5}^{(56)}$	$G_{9,5}^{(57)}$	$G_{9,5}^{(58)}$	$G_{9,5}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

Differentials

$$D(G_{9,5}^{(0)}) = -G_{8,0}^{(56)}$$
$$D(G_{9,5}^{(1)}) = -G_{8,0}^{(58)}$$
$$D(G_{9,5}^{(2)}) = +G_{8,0}^{(51)}$$
$$D(G_{9,5}^{(3)}) = +G_{8,0}^{(53)}$$
$$D(G_{9,5}^{(4)}) = -G_{8,0}^{(50)}$$
$$D(G_{9,5}^{(5)}) = +G_{8,0}^{(58)}$$
$$D(G_{9,5}^{(6)}) = -G_{8,0}^{(52)}$$
$$D(G_{9,5}^{(7)}) = -G_{8,0}^{(59)}$$
$$D(G_{9,5}^{(8)}) = +G_{8,0}^{(49)}$$
$$D(G_{9,5}^{(9)}) = +G_{8,0}^{(52)}$$
$$D(G_{9,5}^{(10)}) = -G_{8,0}^{(48)}$$
$$D(G_{9,5}^{(11)}) = +G_{8,0}^{(56)}$$
$$D(G_{9,5}^{(12)}) = -G_{8,0}^{(53)}$$
$$D(G_{9,5}^{(13)}) = -G_{8,0}^{(57)}$$
$$D(G_{9,5}^{(14)}) = +G_{8,0}^{(48)}$$
$$D(G_{9,5}^{(15)}) = +G_{8,0}^{(50)}$$
$$D(G_{9,5}^{(16)}) = -G_{8,0}^{(49)}$$
$$D(G_{9,5}^{(17)}) = +G_{8,0}^{(54)}$$
$$D(G_{9,5}^{(18)}) = -G_{8,0}^{(51)}$$
$$D(G_{9,5}^{(19)}) = -G_{8,0}^{(55)}$$
$$D(G_{9,5}^{(20)}) = +G_{8,0}^{(60)}$$
$$D(G_{9,5}^{(21)}) = +G_{8,0}^{(61)}$$
$$D(G_{9,5}^{(22)}) = +G_{8,0}^{(62)}$$
$$D(G_{9,5}^{(23)}) = +G_{8,0}^{(63)}$$
$$D(G_{9,5}^{(24)}) = +G_{8,0}^{(64)}$$
$$D(G_{9,5}^{(25)}) = +G_{8,0}^{(65)}$$
$$D(G_{9,5}^{(26)}) = +G_{8,0}^{(66)}$$
$$D(G_{9,5}^{(27)}) = +G_{8,0}^{(67)}$$
$$D(G_{9,5}^{(28)}) = +G_{8,0}^{(68)}$$
$$D(G_{9,5}^{(29)}) = +G_{8,0}^{(69)}$$
$$D(G_{9,5}^{(30)}) = +G_{8,0}^{(70)}$$
$$D(G_{9,5}^{(31)}) = +G_{8,0}^{(71)}$$

The Fatgraph $G_{9,6}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),# a
  Vertex([6, 3, 0]),# b
  Vertex([3, 0, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([2, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

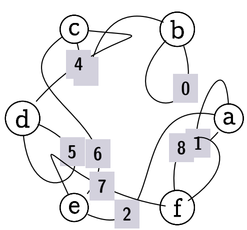
Boundary cycles

$$\alpha = ({}^0e^1 \to {}^1f^2 \to {}^1a^2 \to {}^0a^1 \to {}^2f^0 \to {}^0b^1 \to {}^2e^0 \to {}^0c^1 \to {}^2b^0 \to {}^1e^2)$$
$$\beta = ({}^2a^0)$$
$$\gamma = ({}^2d^0 \to {}^2c^0 \to {}^1d^2 \to {}^1c^2 \to {}^1b^2)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,6}$ only has the identity automorphism, so the marked fatgraphs $G_{9,6}^{(0)}$ to $G_{9,6}^{(120)}$ are formed by decorating boundary cycles of $G_{9,6}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,7}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 2, 1]),# a
  Vertex([3, 0, 0]),# b
  Vertex([6, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([2, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$\alpha = ({}^{0}e^{1} \to {}^{2}d^{0} \to {}^{1}f^{2} \to {}^{0}c^{1} \to {}^{1}a^{2} \to {}^{0}a^{1} \to {}^{2}f^{0} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}b^{0} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$
$\beta = ({}^{2}a^{0})$
$\gamma = ({}^{1}b^{2})$
$\delta = ({}^{0}d^{1})$
$\epsilon = ({}^{0}f^{1})$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
A_1 ‡	d	f	e	a	c	b	8	5	4	7	2	1	6	3	0	α	δ	ϵ	β	γ

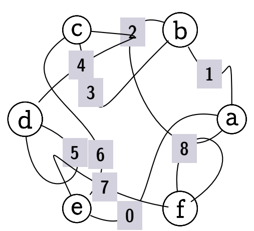
Markings

	$G_{9,7}^{(0)}$	$G_{9,7}^{(1)}$	$G_{9,7}^{(2)}$	$G_{9,7}^{(3)}$	$G_{9,7}^{(4)}$	$G_{9,7}^{(5)}$	$G_{9,7}^{(6)}$	$G_{9,7}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,7}^{(8)}$	$G_{9,7}^{(9)}$	$G_{9,7}^{(10)}$	$G_{9,7}^{(11)}$	$G_{9,7}^{(12)}$	$G_{9,7}^{(13)}$	$G_{9,7}^{(14)}$	$G_{9,7}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	3	4	1	2	2	2	3	3
δ	4	3	4	4	3	4	2	4
ϵ	1	1	2	1	4	3	4	2
	$G_{9,7}^{(16)}$	$G_{9,7}^{(17)}$	$G_{9,7}^{(18)}$	$G_{9,7}^{(19)}$	$G_{9,7}^{(20)}$	$G_{9,7}^{(21)}$	$G_{9,7}^{(22)}$	$G_{9,7}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	0	0	3	4	0	2
δ	2	3	3	4	4	3	4	4
ϵ	3	2	4	3	0	0	2	0
	$G_{9,7}^{(24)}$	$G_{9,7}^{(25)}$	$G_{9,7}^{(26)}$	$G_{9,7}^{(27)}$	$G_{9,7}^{(28)}$	$G_{9,7}^{(29)}$	$G_{9,7}^{(30)}$	$G_{9,7}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	0	0
δ	3	4	1	4	1	3	3	4
ϵ	4	3	4	1	3	1	4	3

(continued.)

	$G_{9,7}^{(32)}$	$G_{9,7}^{(33)}$	$G_{9,7}^{(34)}$	$G_{9,7}^{(35)}$	$G_{9,7}^{(36)}$	$G_{9,7}^{(37)}$	$G_{9,7}^{(38)}$	$G_{9,7}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	3	4	0	1	1	1	2	2
δ	4	3	4	4	2	4	1	4
ϵ	0	0	1	0	4	2	4	1
	$G_{9,7}^{(40)}$	$G_{9,7}^{(41)}$	$G_{9,7}^{(42)}$	$G_{9,7}^{(43)}$	$G_{9,7}^{(44)}$	$G_{9,7}^{(45)}$	$G_{9,7}^{(46)}$	$G_{9,7}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	0	0	2	4	0	1
δ	1	2	2	4	4	2	4	4
ϵ	2	1	4	2	0	0	1	0
	$G_{9,7}^{(48)}$	$G_{9,7}^{(49)}$	$G_{9,7}^{(50)}$	$G_{9,7}^{(51)}$	$G_{9,7}^{(52)}$	$G_{9,7}^{(53)}$	$G_{9,7}^{(54)}$	$G_{9,7}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	0	0
δ	2	3	1	3	1	2	2	3
ϵ	3	2	3	1	2	1	3	2
	$G_{9,7}^{(56)}$	$G_{9,7}^{(57)}$	$G_{9,7}^{(58)}$	$G_{9,7}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	2	3	0	1				
δ	3	2	3	3				
ϵ	0	0	1	0				

The Fatgraph $G_{9,8}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([6, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([0, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

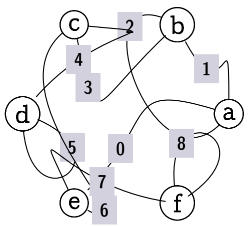
Boundary cycles

$$\alpha = ({}^0e^1 \to {}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^1f^2 \to {}^1a^2 \to {}^2f^0 \to {}^2c^0 \to {}^2e^0 \to {}^1c^2 \to {}^0b^1 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,8}$ only has the identity automorphism, so the marked fatgraphs $G_{9,8}^{(0)}$ to $G_{9,8}^{(120)}$ are formed by decorating boundary cycles of $G_{9,8}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,9}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([6, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([6, 0, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^1f^2 \to {}^0a^1 \to {}^2f^0 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\beta = ({}^2d^0 \to {}^0e^1 \to {}^1a^2 \to {}^2c^0 \to {}^1c^2 \to {}^0b^1 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
A_1‡	b	a	e	f	c	d	3	2	1	0	7	8	6	4	5	β	α	γ	ϵ	δ

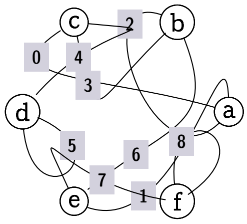
Markings

	$G_{9,9}^{(0)}$	$G_{9,9}^{(1)}$	$G_{9,9}^{(2)}$	$G_{9,9}^{(3)}$	$G_{9,9}^{(4)}$	$G_{9,9}^{(5)}$	$G_{9,9}^{(6)}$	$G_{9,9}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,9}^{(8)}$	$G_{9,9}^{(9)}$	$G_{9,9}^{(10)}$	$G_{9,9}^{(11)}$	$G_{9,9}^{(12)}$	$G_{9,9}^{(13)}$	$G_{9,9}^{(14)}$	$G_{9,9}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{9,9}^{(16)}$	$G_{9,9}^{(17)}$	$G_{9,9}^{(18)}$	$G_{9,9}^{(19)}$	$G_{9,9}^{(20)}$	$G_{9,9}^{(21)}$	$G_{9,9}^{(22)}$	$G_{9,9}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{9,9}^{(24)}$	$G_{9,9}^{(25)}$	$G_{9,9}^{(26)}$	$G_{9,9}^{(27)}$	$G_{9,9}^{(28)}$	$G_{9,9}^{(29)}$	$G_{9,9}^{(30)}$	$G_{9,9}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{9,9}^{(32)}$	$G_{9,9}^{(33)}$	$G_{9,9}^{(34)}$	$G_{9,9}^{(35)}$	$G_{9,9}^{(36)}$	$G_{9,9}^{(37)}$	$G_{9,9}^{(38)}$	$G_{9,9}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{9,9}^{(40)}$	$G_{9,9}^{(41)}$	$G_{9,9}^{(42)}$	$G_{9,9}^{(43)}$	$G_{9,9}^{(44)}$	$G_{9,9}^{(45)}$	$G_{9,9}^{(46)}$	$G_{9,9}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{9,9}^{(48)}$	$G_{9,9}^{(49)}$	$G_{9,9}^{(50)}$	$G_{9,9}^{(51)}$	$G_{9,9}^{(52)}$	$G_{9,9}^{(53)}$	$G_{9,9}^{(54)}$	$G_{9,9}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0

(continued.)

δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{9,9}^{(56)}$	$G_{9,9}^{(57)}$	$G_{9,9}^{(58)}$	$G_{9,9}^{(59)}$				
α	3	3	3	3				
β	4	4	4	4				
γ	1	1	2	2				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{9,10}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 6]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([1, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

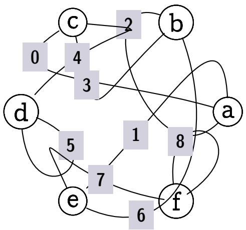
Boundary cycles

$$\alpha = ({}^1f^2 \to {}^0a^1 \to {}^2f^0 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\beta = ({}^2d^0 \to {}^1a^2 \to {}^2c^0 \to {}^1c^2 \to {}^0b^1 \to {}^1d^2)$$
$$\gamma = ({}^0e^1 \to {}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,10}$ only has the identity automorphism, so the marked fatgraphs $G_{9,10}^{(0)}$ to $G_{9,10}^{(120)}$ are formed by decorating boundary cycles of $G_{9,10}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,11}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 6]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([6, 1, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^{0}e^{1} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}c^{0} \to {}^{1}c^{2} \to {}^{0}b^{1} \to {}^{1}d^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{1}f^{2} \to {}^{2}f^{0} \to {}^{2}e^{0} \to {}^{2}b^{0} \to {}^{1}e^{2})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{0}f^{1})$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
A_1‡	b	a	e	f	c	d	6	3	2	1	7	8	0	4	5	α	γ	β	ϵ	δ

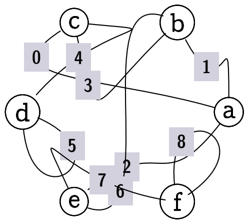
Markings

	$G_{9,11}^{(0)}$	$G_{9,11}^{(1)}$	$G_{9,11}^{(2)}$	$G_{9,11}^{(3)}$	$G_{9,11}^{(4)}$	$G_{9,11}^{(5)}$	$G_{9,11}^{(6)}$	$G_{9,11}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{9,11}^{(8)}$	$G_{9,11}^{(9)}$	$G_{9,11}^{(10)}$	$G_{9,11}^{(11)}$	$G_{9,11}^{(12)}$	$G_{9,11}^{(13)}$	$G_{9,11}^{(14)}$	$G_{9,11}^{(15)}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	0	0	0	0
γ	4	4	4	4	2	2	3	3
δ	1	3	1	2	3	4	2	4
ϵ	3	1	2	1	4	3	4	2

(continued.)

	$G_{9,11}^{(16)}$	$G_{9,11}^{(17)}$	$G_{9,11}^{(18)}$	$G_{9,11}^{(19)}$	$G_{9,11}^{(20)}$	$G_{9,11}^{(21)}$	$G_{9,11}^{(22)}$	$G_{9,11}^{(23)}$
α	1	1	1	1	1	1	1	1
β	0	0	2	2	2	2	3	3
γ	4	4	3	3	4	4	4	4
δ	2	3	0	4	0	3	0	2
ϵ	3	2	4	0	3	0	2	0
	$G_{9,11}^{(24)}$	$G_{9,11}^{(25)}$	$G_{9,11}^{(26)}$	$G_{9,11}^{(27)}$	$G_{9,11}^{(28)}$	$G_{9,11}^{(29)}$	$G_{9,11}^{(30)}$	$G_{9,11}^{(31)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	3	3
δ	3	4	1	4	1	3	0	4
ϵ	4	3	4	1	3	1	4	0
	$G_{9,11}^{(32)}$	$G_{9,11}^{(33)}$	$G_{9,11}^{(34)}$	$G_{9,11}^{(35)}$	$G_{9,11}^{(36)}$	$G_{9,11}^{(37)}$	$G_{9,11}^{(38)}$	$G_{9,11}^{(39)}$
α	2	2	2	2	3	3	3	3
β	1	1	3	3	0	0	0	0
γ	4	4	4	4	1	1	2	2
δ	0	3	0	1	2	4	1	4
ϵ	3	0	1	0	4	2	4	1
	$G_{9,11}^{(40)}$	$G_{9,11}^{(41)}$	$G_{9,11}^{(42)}$	$G_{9,11}^{(43)}$	$G_{9,11}^{(44)}$	$G_{9,11}^{(45)}$	$G_{9,11}^{(46)}$	$G_{9,11}^{(47)}$
α	3	3	3	3	3	3	3	3
β	0	0	1	1	1	1	2	2
γ	4	4	2	2	4	4	4	4
δ	1	2	0	4	0	2	0	1
ϵ	2	1	4	0	2	0	1	0
	$G_{9,11}^{(48)}$	$G_{9,11}^{(49)}$	$G_{9,11}^{(50)}$	$G_{9,11}^{(51)}$	$G_{9,11}^{(52)}$	$G_{9,11}^{(53)}$	$G_{9,11}^{(54)}$	$G_{9,11}^{(55)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	2	2
δ	2	3	1	3	1	2	0	3
ϵ	3	2	3	1	2	1	3	0
	$G_{9,11}^{(56)}$	$G_{9,11}^{(57)}$	$G_{9,11}^{(58)}$	$G_{9,11}^{(59)}$				
α	4	4	4	4				
β	1	1	2	2				
γ	3	3	3	3				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{9,12}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([6, 3, 1]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([6, 2, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}f^{2} \to {}^{1}a^{2} \to {}^{2}f^{0} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$$
$$\gamma = ({}^{0}e^{1} \to {}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{0}d^{1})$$
$$\epsilon = ({}^{0}f^{1})$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
A_1 ‡	b	a	e	f	c	d	6	1	3	2	7	8	0	4	5	γ	β	α	ϵ	δ

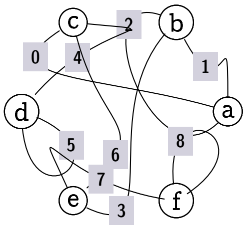
Markings

	$G_{9,12}^{(0)}$	$G_{9,12}^{(1)}$	$G_{9,12}^{(2)}$	$G_{9,12}^{(3)}$	$G_{9,12}^{(4)}$	$G_{9,12}^{(5)}$	$G_{9,12}^{(6)}$	$G_{9,12}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,12}^{(8)}$	$G_{9,12}^{(9)}$	$G_{9,12}^{(10)}$	$G_{9,12}^{(11)}$	$G_{9,12}^{(12)}$	$G_{9,12}^{(13)}$	$G_{9,12}^{(14)}$	$G_{9,12}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{9,12}^{(16)}$	$G_{9,12}^{(17)}$	$G_{9,12}^{(18)}$	$G_{9,12}^{(19)}$	$G_{9,12}^{(20)}$	$G_{9,12}^{(21)}$	$G_{9,12}^{(22)}$	$G_{9,12}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{9,12}^{(24)}$	$G_{9,12}^{(25)}$	$G_{9,12}^{(26)}$	$G_{9,12}^{(27)}$	$G_{9,12}^{(28)}$	$G_{9,12}^{(29)}$	$G_{9,12}^{(30)}$	$G_{9,12}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G_{9,12}^{(32)}$	$G_{9,12}^{(33)}$	$G_{9,12}^{(34)}$	$G_{9,12}^{(35)}$	$G_{9,12}^{(36)}$	$G_{9,12}^{(37)}$	$G_{9,12}^{(38)}$	$G_{9,12}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{9,12}^{(40)}$	$G_{9,12}^{(41)}$	$G_{9,12}^{(42)}$	$G_{9,12}^{(43)}$	$G_{9,12}^{(44)}$	$G_{9,12}^{(45)}$	$G_{9,12}^{(46)}$	$G_{9,12}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{9,12}^{(48)}$	$G_{9,12}^{(49)}$	$G_{9,12}^{(50)}$	$G_{9,12}^{(51)}$	$G_{9,12}^{(52)}$	$G_{9,12}^{(53)}$	$G_{9,12}^{(54)}$	$G_{9,12}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4
δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G_{9,12}^{(56)}$	$G_{9,12}^{(57)}$	$G_{9,12}^{(58)}$	$G_{9,12}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{9,13}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([0, 6, 4]),# c
  Vertex([5, 5, 4]),# d
  Vertex([3, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

$$\alpha = ({}^1f^2 \to {}^0a^1 \to {}^2f^0 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\beta = ({}^0e^1 \to {}^2d^0 \to {}^1a^2 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	e	f	c	d	3	2	1	0	7	8	6	4	5	β	α	γ	ϵ	δ

Markings

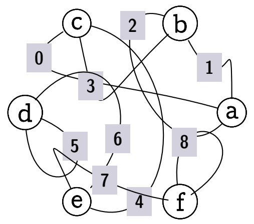
	$G_{9,13}^{(0)}$	$G_{9,13}^{(1)}$	$G_{9,13}^{(2)}$	$G_{9,13}^{(3)}$	$G_{9,13}^{(4)}$	$G_{9,13}^{(5)}$	$G_{9,13}^{(6)}$	$G_{9,13}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3

	$G_{9,13}^{(8)}$	$G_{9,13}^{(9)}$	$G_{9,13}^{(10)}$	$G_{9,13}^{(11)}$	$G_{9,13}^{(12)}$	$G_{9,13}^{(13)}$	$G_{9,13}^{(14)}$	$G_{9,13}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1

(continued.)

	$G_{9,13}^{(16)}$	$G_{9,13}^{(17)}$	$G_{9,13}^{(18)}$	$G_{9,13}^{(19)}$	$G_{9,13}^{(20)}$	$G_{9,13}^{(21)}$	$G_{9,13}^{(22)}$	$G_{9,13}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{9,13}^{(24)}$	$G_{9,13}^{(25)}$	$G_{9,13}^{(26)}$	$G_{9,13}^{(27)}$	$G_{9,13}^{(28)}$	$G_{9,13}^{(29)}$	$G_{9,13}^{(30)}$	$G_{9,13}^{(31)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	2	2	3	3
γ	0	0	3	3	4	4	0	0
δ	3	4	0	4	0	3	2	4
ϵ	4	3	4	0	3	0	4	2
	$G_{9,13}^{(32)}$	$G_{9,13}^{(33)}$	$G_{9,13}^{(34)}$	$G_{9,13}^{(35)}$	$G_{9,13}^{(36)}$	$G_{9,13}^{(37)}$	$G_{9,13}^{(38)}$	$G_{9,13}^{(39)}$
α	1	1	1	1	1	1	1	1
β	3	3	3	3	4	4	4	4
γ	2	2	4	4	0	0	2	2
δ	0	4	0	2	2	3	0	3
ϵ	4	0	2	0	3	2	3	0
	$G_{9,13}^{(40)}$	$G_{9,13}^{(41)}$	$G_{9,13}^{(42)}$	$G_{9,13}^{(43)}$	$G_{9,13}^{(44)}$	$G_{9,13}^{(45)}$	$G_{9,13}^{(46)}$	$G_{9,13}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	3	3	3	3	3	3
γ	3	3	0	0	1	1	4	4
δ	0	2	1	4	0	4	0	1
ϵ	2	0	4	1	4	0	1	0
	$G_{9,13}^{(48)}$	$G_{9,13}^{(49)}$	$G_{9,13}^{(50)}$	$G_{9,13}^{(51)}$	$G_{9,13}^{(52)}$	$G_{9,13}^{(53)}$	$G_{9,13}^{(54)}$	$G_{9,13}^{(55)}$
α	2	2	2	2	2	2	3	3
β	4	4	4	4	4	4	4	4
γ	0	0	1	1	3	3	0	0
δ	1	3	0	3	0	1	1	2
ϵ	3	1	3	0	1	0	2	1
	$G_{9,13}^{(56)}$	$G_{9,13}^{(57)}$	$G_{9,13}^{(58)}$	$G_{9,13}^{(59)}$				
α	3	3	3	3				
β	4	4	4	4				
γ	1	1	2	2				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{9,14}$ (120 orientable markings)



```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([0, 3, 4]),# c
  Vertex([5, 5, 6]),# d
  Vertex([4, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

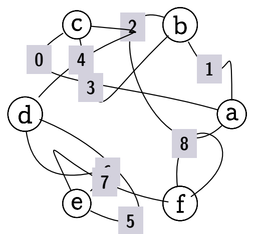
Boundary cycles

$\alpha = ({}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$
$\beta = ({}^{0}e^{1} \to {}^{2}d^{0} \to {}^{1}f^{2} \to {}^{1}a^{2} \to {}^{2}f^{0} \to {}^{0}b^{1} \to {}^{2}e^{0} \to {}^{1}c^{2} \to {}^{2}c^{0} \to {}^{1}e^{2} \to {}^{1}d^{2})$
$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$
$\delta = ({}^{0}d^{1})$
$\epsilon = ({}^{0}f^{1})$

Markings

Fatgraph $G_{9,14}$ only has the identity automorphism, so the marked fatgraphs $G_{9,14}^{(0)}$ to $G_{9,14}^{(120)}$ are formed by decorating boundary cycles of $G_{9,14}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,15}$ (120 orientable markings)



```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([0, 3, 4]),# c
  Vertex([6, 5, 4]),# d
  Vertex([5, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

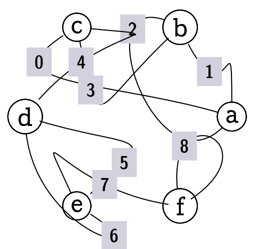
Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^1f^2 \to {}^1a^2 \to {}^2f^0 \to {}^0b^1 \to {}^2e^0 \to {}^1c^2 \to {}^2c^0 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0e^1 \to {}^0d^1)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,15}$ only has the identity automorphism, so the marked fatgraphs $G_{9,15}^{(0)}$ to $G_{9,15}^{(120)}$ are formed by decorating boundary cycles of $G_{9,15}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,16}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([0, 3, 4]),# c
  Vertex([6, 5, 4]),# d
  Vertex([6, 5, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

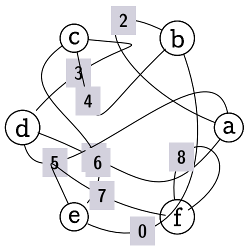
$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^0e^1 \to {}^1a^2 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0d^1 \to {}^1f^2 \to {}^1e^2 \to {}^2e^0 \to {}^2f^0)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,16}$ only has the identity automorphism, so the marked fatgraphs $G_{9,16}^{(0)}$ to $G_{9,16}^{(120)}$ are formed by decorating boundary cycles of $G_{9,16}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,17}$ (120 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),# a
  Vertex([2, 4, 0]),# b
  Vertex([6, 4, 3]),# c
  Vertex([5, 1, 3]),# d
  Vertex([0, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

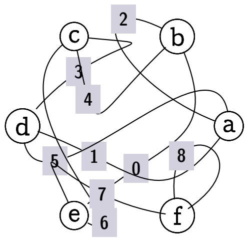
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1f^2 \to {}^1a^2 \to {}^2f^0 \to {}^2c^0 \to {}^2e^0 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^0d^1)$$
$$\delta = ({}^0e^1 \to {}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,17}$ only has the identity automorphism, so the marked fatgraphs $G_{9,17}^{(0)}$ to $G_{9,17}^{(120)}$ are formed by decorating boundary cycles of $G_{9,17}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,18}$ (120 orientable markings)



```
Fatgraph([
  Vertex([5, 2, 1]),# a
  Vertex([2, 4, 0]),# b
  Vertex([6, 4, 3]),# c
  Vertex([5, 1, 3]),# d
  Vertex([6, 0, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

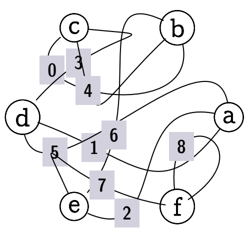
Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^0e^1 \to {}^2b^0 \to {}^1d^2 \to {}^2c^0)$$
$$\gamma = ({}^2a^0 \to {}^0d^1)$$
$$\delta = ({}^1f^2 \to {}^2f^0 \to {}^1b^2 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,18}$ only has the identity automorphism, so the marked fatgraphs $G_{9,18}^{(0)}$ to $G_{9,18}^{(120)}$ are formed by decorating boundary cycles of $G_{9,18}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,19}$ (120 orientable markings)



```
Fatgraph([
  Vertex([5, 2, 1]),# a
  Vertex([6, 4, 0]),# b
  Vertex([0, 4, 3]),# c
  Vertex([5, 1, 3]),# d
  Vertex([2, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

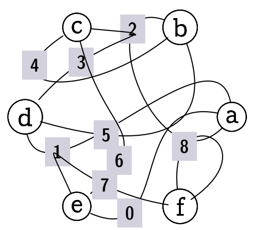
Boundary cycles

$$\alpha = ({}^0e^1 \to {}^2d^0 \to {}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1f^2 \to {}^1a^2 \to {}^2f^0 \to {}^2c^0 \to {}^2e^0 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^2a^0 \to {}^0d^1)$$
$$\delta = ({}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,19}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{9,19}$ to $G^{(120)}_{9,19}$ are formed by decorating boundary cycles of $G_{9,19}$ with all permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,20}$ (120 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 4, 5]),# b
  Vertex([4, 6, 3]),# c
  Vertex([1, 5, 3]),# d
  Vertex([0, 6, 7]),# e
  Vertex([8, 8, 7]),# f
])
```

Boundary cycles

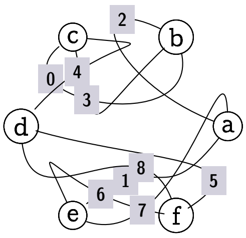
$$\alpha = ({}^0e^1 \to {}^2d^0 \to {}^0a^1 \to {}^1c^2)$$
$$\beta = ({}^1f^2 \to {}^1a^2 \to {}^2f^0 \to {}^0b^1 \to {}^2e^0 \to {}^0c^1 \to {}^1e^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0 \to {}^0d^1)$$
$$\delta = ({}^2c^0 \to {}^1d^2 \to {}^1b^2)$$
$$\epsilon = ({}^0f^1)$$

Markings

Fatgraph $G_{9,20}$ only has the identity automorphism, so the marked fatgraphs $G^{(0)}_{9,20}$ to $G^{(120)}_{9,20}$ are formed by decorating boundary cycles of $G_{9,20}$ with all

permutations of $(0, 1, 2, 3, 4)$ in lexicographic order. See Section "Markings of fatgraphs with trivial automorphisms" for a complete table.

The Fatgraph $G_{9,21}$ (20 orientable markings)




```
Fatgraph([
  Vertex([7, 2, 1]),# a
  Vertex([2, 3, 0]),# b
  Vertex([0, 3, 4]),# c
  Vertex([8, 5, 4]),# d
  Vertex([7, 1, 6]),# e
  Vertex([5, 8, 6]),# f
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^1f^2 \to {}^0a^1 \to {}^0b^1 \to {}^2e^0 \to {}^1c^2)$$
$$\beta = ({}^1a^2 \to {}^2f^0 \to {}^2c^0 \to {}^2b^0 \to {}^1e^2 \to {}^1d^2)$$
$$\gamma = ({}^0e^1 \to {}^2a^0)$$
$$\delta = ({}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^0d^1 \to {}^0f^1)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^‡$	b	a	e	f	c	d	7	3	2	1	6	8	4	0	5	β	α	δ	γ	ϵ
$A_2{}^‡$	c	d	f	e	b	a	5	0	4	8	6	1	2	3	7	α	β	δ	ϵ	γ
$A_3{}^‡$	d	c	b	a	f	e	3	8	4	0	2	7	6	5	1	β	α	ϵ	δ	γ
$A_4{}^‡$	e	f	d	c	a	b	8	7	6	5	4	3	2	1	0	β	α	γ	ϵ	δ
$A_5{}^‡$	f	e	a	b	d	c	1	5	6	7	2	0	4	8	3	α	β	ϵ	γ	δ

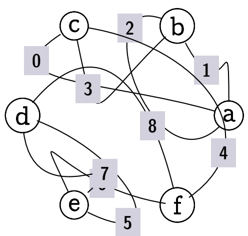
Markings

	$G^{(0)}_{9,21}$	$G^{(1)}_{9,21}$	$G^{(2)}_{9,21}$	$G^{(3)}_{9,21}$	$G^{(4)}_{9,21}$	$G^{(5)}_{9,21}$	$G^{(6)}_{9,21}$	$G^{(7)}_{9,21}$
α	0	0	0	0	0	0	0	0
β	1	1	2	2	3	3	4	4

(continued.)

γ	2	2	1	1	1	1	1	1
δ	3	4	3	4	2	4	2	3
ϵ	4	3	4	3	4	2	3	2
	$G_{9,21}^{(8)}$	$G_{9,21}^{(9)}$	$G_{9,21}^{(10)}$	$G_{9,21}^{(11)}$	$G_{9,21}^{(12)}$	$G_{9,21}^{(13)}$	$G_{9,21}^{(14)}$	$G_{9,21}^{(15)}$
α	1	1	1	1	1	1	2	2
β	2	2	3	3	4	4	3	3
γ	0	0	0	0	0	0	0	0
δ	3	4	2	4	2	3	1	4
ϵ	4	3	4	2	3	2	4	1
	$G_{9,21}^{(16)}$	$G_{9,21}^{(17)}$	$G_{9,21}^{(18)}$	$G_{9,21}^{(19)}$				
α	2	2	3	3				
β	4	4	4	4				
γ	0	0	0	0				
δ	1	3	1	2				
ϵ	3	1	2	1				

The Fatgraph $G_{9,22}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([0, 3, 4]),# c
  Vertex([7, 5, 8]),# d
  Vertex([5, 7, 6]),# e
  Vertex([4, 8, 6]),# f
])
```

Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^2d^0 \to {}^0f^1 \to {}^1a^2 \to {}^2f^0 \to {}^0b^1 \to {}^1c^2 \to {}^2c^0 \to {}^1e^2)$$
$$\gamma = ({}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^0e^1 \to {}^0d^1)$$
$$\epsilon = ({}^1f^2 \to {}^1d^2 \to {}^2e^0)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^\ddagger$	d	e	f	a	b	c	8	5	7	6	4	1	3	2	0	ϵ	β	δ	γ	α

Markings

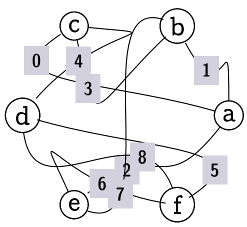
	$G^{(0)}_{9,22}$	$G^{(1)}_{9,22}$	$G^{(2)}_{9,22}$	$G^{(3)}_{9,22}$	$G^{(4)}_{9,22}$	$G^{(5)}_{9,22}$	$G^{(6)}_{9,22}$	$G^{(7)}_{9,22}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{9,22}$	$G^{(9)}_{9,22}$	$G^{(10)}_{9,22}$	$G^{(11)}_{9,22}$	$G^{(12)}_{9,22}$	$G^{(13)}_{9,22}$	$G^{(14)}_{9,22}$	$G^{(15)}_{9,22}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}_{9,22}$	$G^{(17)}_{9,22}$	$G^{(18)}_{9,22}$	$G^{(19)}_{9,22}$	$G^{(20)}_{9,22}$	$G^{(21)}_{9,22}$	$G^{(22)}_{9,22}$	$G^{(23)}_{9,22}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}_{9,22}$	$G^{(25)}_{9,22}$	$G^{(26)}_{9,22}$	$G^{(27)}_{9,22}$	$G^{(28)}_{9,22}$	$G^{(29)}_{9,22}$	$G^{(30)}_{9,22}$	$G^{(31)}_{9,22}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(32)}_{9,22}$	$G^{(33)}_{9,22}$	$G^{(34)}_{9,22}$	$G^{(35)}_{9,22}$	$G^{(36)}_{9,22}$	$G^{(37)}_{9,22}$	$G^{(38)}_{9,22}$	$G^{(39)}_{9,22}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	0	0	2	4	0	0	2	3
ϵ	4	3	4	2	4	2	3	2
	$G^{(40)}_{9,22}$	$G^{(41)}_{9,22}$	$G^{(42)}_{9,22}$	$G^{(43)}_{9,22}$	$G^{(44)}_{9,22}$	$G^{(45)}_{9,22}$	$G^{(46)}_{9,22}$	$G^{(47)}_{9,22}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	0	0	3	4	1	1	3	4
ϵ	3	2	4	3	4	3	4	3

(continued.)

	$G_{9,22}^{(48)}$	$G_{9,22}^{(49)}$	$G_{9,22}^{(50)}$	$G_{9,22}^{(51)}$	$G_{9,22}^{(52)}$	$G_{9,22}^{(53)}$	$G_{9,22}^{(54)}$	$G_{9,22}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	0	0	1	0	1	0	2	1
ϵ	4	3	4	4	3	3	4	4

	$G_{9,22}^{(56)}$	$G_{9,22}^{(57)}$	$G_{9,22}^{(58)}$	$G_{9,22}^{(59)}$
α	3	3	3	3
β	1	1	2	2
γ	0	2	0	1
δ	2	0	1	0
ϵ	4	4	4	4

The Fatgraph $G_{9,23}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([7, 3, 1]),# b
  Vertex([0, 3, 4]),# c
  Vertex([8, 5, 4]),# d
  Vertex([7, 2, 6]),# e
  Vertex([5, 8, 6]),# f
])
```

Boundary cycles

$$\alpha = ({}^0a^1 \to {}^0c^1 \to {}^1b^2)$$
$$\beta = ({}^1a^2 \to {}^1e^2 \to {}^1d^2 \to {}^2f^0 \to {}^2c^0)$$
$$\gamma = ({}^0e^1 \to {}^2a^0 \to {}^2b^0)$$
$$\delta = ({}^2d^0 \to {}^1f^2 \to {}^2e^0 \to {}^1c^2 \to {}^0b^1)$$
$$\epsilon = ({}^0d^1 \to {}^0f^1)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	b	a	e	f	c	d	7	1	3	2	6	8	4	0	5	γ	δ	α	β	ϵ

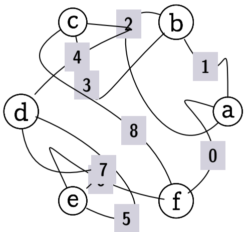
Markings

	$G_{9,23}^{(0)}$	$G_{9,23}^{(1)}$	$G_{9,23}^{(2)}$	$G_{9,23}^{(3)}$	$G_{9,23}^{(4)}$	$G_{9,23}^{(5)}$	$G_{9,23}^{(6)}$	$G_{9,23}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,23}^{(8)}$	$G_{9,23}^{(9)}$	$G_{9,23}^{(10)}$	$G_{9,23}^{(11)}$	$G_{9,23}^{(12)}$	$G_{9,23}^{(13)}$	$G_{9,23}^{(14)}$	$G_{9,23}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{9,23}^{(16)}$	$G_{9,23}^{(17)}$	$G_{9,23}^{(18)}$	$G_{9,23}^{(19)}$	$G_{9,23}^{(20)}$	$G_{9,23}^{(21)}$	$G_{9,23}^{(22)}$	$G_{9,23}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{9,23}^{(24)}$	$G_{9,23}^{(25)}$	$G_{9,23}^{(26)}$	$G_{9,23}^{(27)}$	$G_{9,23}^{(28)}$	$G_{9,23}^{(29)}$	$G_{9,23}^{(30)}$	$G_{9,23}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	3	3
δ	3	4	2	4	2	3	0	4
ϵ	4	3	4	2	3	2	4	0
	$G_{9,23}^{(32)}$	$G_{9,23}^{(33)}$	$G_{9,23}^{(34)}$	$G_{9,23}^{(35)}$	$G_{9,23}^{(36)}$	$G_{9,23}^{(37)}$	$G_{9,23}^{(38)}$	$G_{9,23}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	4	4	2	2	4	4	2	2
δ	0	3	0	4	0	2	0	3
ϵ	3	0	4	0	2	0	3	0
	$G_{9,23}^{(40)}$	$G_{9,23}^{(41)}$	$G_{9,23}^{(42)}$	$G_{9,23}^{(43)}$	$G_{9,23}^{(44)}$	$G_{9,23}^{(45)}$	$G_{9,23}^{(46)}$	$G_{9,23}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	3	3	3	3	4	4	3	3
δ	0	2	1	4	1	3	0	4
ϵ	2	0	4	1	3	1	4	0
	$G_{9,23}^{(48)}$	$G_{9,23}^{(49)}$	$G_{9,23}^{(50)}$	$G_{9,23}^{(51)}$	$G_{9,23}^{(52)}$	$G_{9,23}^{(53)}$	$G_{9,23}^{(54)}$	$G_{9,23}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	4	4	4	4	3	3	4	4

(continued.)

δ	0	3	0	1	0	1	1	2
ϵ	3	0	1	0	1	0	2	1
	$G_{9,23}^{(56)}$	$G_{9,23}^{(57)}$	$G_{9,23}^{(58)}$	$G_{9,23}^{(59)}$				
α	3	3	3	3				
β	1	1	2	2				
γ	4	4	4	4				
δ	0	2	0	1				
ϵ	2	0	1	0				

The Fatgraph $G_{9,24}$ (60 orientable markings)




```
Fatgraph([
  Vertex([1, 0, 2]),# a
  Vertex([2, 3, 1]),# b
  Vertex([8, 3, 4]),# c
  Vertex([7, 5, 4]),# d
  Vertex([5, 7, 6]),# e
  Vertex([0, 8, 6]),# f
])
```

Boundary cycles

$$\alpha = ({}^{0}f^{1} \to {}^{0}a^{1} \to {}^{0}c^{1} \to {}^{1}b^{2})$$
$$\beta = ({}^{2}d^{0} \to {}^{1}a^{2} \to {}^{2}f^{0} \to {}^{0}b^{1} \to {}^{1}c^{2} \to {}^{1}e^{2})$$
$$\gamma = ({}^{2}a^{0} \to {}^{2}b^{0})$$
$$\delta = ({}^{1}f^{2} \to {}^{2}e^{0} \to {}^{1}d^{2} \to {}^{2}c^{0})$$
$$\epsilon = ({}^{0}e^{1} \to {}^{0}d^{1})$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^{\ddagger}$	d	e	f	a	b	c	4	5	7	6	0	1	3	2	8	δ	β	ϵ	α	γ

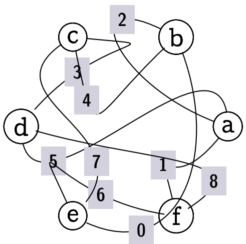
Markings

	$G_{9,24}^{(0)}$	$G_{9,24}^{(1)}$	$G_{9,24}^{(2)}$	$G_{9,24}^{(3)}$	$G_{9,24}^{(4)}$	$G_{9,24}^{(5)}$	$G_{9,24}^{(6)}$	$G_{9,24}^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,24}^{(8)}$	$G_{9,24}^{(9)}$	$G_{9,24}^{(10)}$	$G_{9,24}^{(11)}$	$G_{9,24}^{(12)}$	$G_{9,24}^{(13)}$	$G_{9,24}^{(14)}$	$G_{9,24}^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G_{9,24}^{(16)}$	$G_{9,24}^{(17)}$	$G_{9,24}^{(18)}$	$G_{9,24}^{(19)}$	$G_{9,24}^{(20)}$	$G_{9,24}^{(21)}$	$G_{9,24}^{(22)}$	$G_{9,24}^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4
γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G_{9,24}^{(24)}$	$G_{9,24}^{(25)}$	$G_{9,24}^{(26)}$	$G_{9,24}^{(27)}$	$G_{9,24}^{(28)}$	$G_{9,24}^{(29)}$	$G_{9,24}^{(30)}$	$G_{9,24}^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G_{9,24}^{(32)}$	$G_{9,24}^{(33)}$	$G_{9,24}^{(34)}$	$G_{9,24}^{(35)}$	$G_{9,24}^{(36)}$	$G_{9,24}^{(37)}$	$G_{9,24}^{(38)}$	$G_{9,24}^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	3	3	3	3	4	4
γ	3	4	0	0	2	4	0	0
δ	4	3	2	4	4	2	2	3
ϵ	0	0	4	2	0	0	3	2
	$G_{9,24}^{(40)}$	$G_{9,24}^{(41)}$	$G_{9,24}^{(42)}$	$G_{9,24}^{(43)}$	$G_{9,24}^{(44)}$	$G_{9,24}^{(45)}$	$G_{9,24}^{(46)}$	$G_{9,24}^{(47)}$
α	1	1	2	2	2	2	2	2
β	4	4	0	0	0	0	1	1
γ	2	3	1	1	3	4	0	0
δ	3	2	3	4	4	3	3	4
ϵ	0	0	4	3	1	1	4	3
	$G_{9,24}^{(48)}$	$G_{9,24}^{(49)}$	$G_{9,24}^{(50)}$	$G_{9,24}^{(51)}$	$G_{9,24}^{(52)}$	$G_{9,24}^{(53)}$	$G_{9,24}^{(54)}$	$G_{9,24}^{(55)}$
α	2	2	2	2	2	2	3	3
β	1	1	3	3	4	4	0	0
γ	3	4	0	1	0	1	1	2
δ	4	3	4	4	3	3	4	4
ϵ	0	0	1	0	1	0	2	1

(continued.)

	$G_{9,24}^{(56)}$	$G_{9,24}^{(57)}$	$G_{9,24}^{(58)}$	$G_{9,24}^{(59)}$
α	3	3	3	3
β	1	1	2	2
γ	0	2	0	1
δ	4	4	4	4
ϵ	2	0	1	0

The Fatgraph $G_{9,25}$ (20 orientable markings)




```
Fatgraph([
  Vertex([5, 2, 1]),# a
  Vertex([2, 4, 0]),# b
  Vertex([7, 4, 3]),# c
  Vertex([5, 8, 3]),# d
  Vertex([0, 7, 6]),# e
  Vertex([8, 1, 6]),# f
])
```

Boundary cycles

$$\alpha = ({}^2d^0 \to {}^0a^1 \to {}^1c^2 \to {}^0b^1)$$
$$\beta = ({}^1a^2 \to {}^2b^0 \to {}^1f^2 \to {}^2e^0)$$
$$\gamma = ({}^2a^0 \to {}^0f^1 \to {}^0d^1)$$
$$\delta = ({}^0e^1 \to {}^0c^1 \to {}^1b^2)$$
$$\epsilon = ({}^1e^2 \to {}^1d^2 \to {}^2f^0 \to {}^2c^0)$$

Automorphisms

A_0	a	b	c	d	e	f	0	1	2	3	4	5	6	7	8	α	β	γ	δ	ϵ
$A_1{}^\ddagger$	b	a	f	e	d	c	5	4	2	6	1	0	3	8	7	β	α	δ	γ	ϵ
$A_2{}^\ddagger$	c	d	a	b	f	e	8	7	3	2	5	4	6	1	0	α	ϵ	δ	γ	β
$A_3{}^\ddagger$	d	c	e	f	b	a	4	5	3	6	7	8	2	0	1	ϵ	α	γ	δ	β
$A_4{}^\ddagger$	e	f	d	c	a	b	1	0	6	3	8	7	2	5	4	ϵ	β	δ	γ	α
$A_5{}^\ddagger$	f	e	b	a	c	d	7	8	6	2	0	1	3	4	5	β	ϵ	γ	δ	α

	$G^{(0)}_{9,25}$	$G^{(1)}_{9,25}$	$G^{(2)}_{9,25}$	$G^{(3)}_{9,25}$	$G^{(4)}_{9,25}$	$G^{(5)}_{9,25}$	$G^{(6)}_{9,25}$	$G^{(7)}_{9,25}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}_{9,25}$	$G^{(9)}_{9,25}$	$G^{(10)}_{9,25}$	$G^{(11)}_{9,25}$	$G^{(12)}_{9,25}$	$G^{(13)}_{9,25}$	$G^{(14)}_{9,25}$	$G^{(15)}_{9,25}$
α	0	0	0	0	1	1	1	1
β	2	2	3	3	2	2	2	2
γ	3	4	1	2	0	0	3	4
δ	1	1	2	1	3	4	0	0
ϵ	4	3	4	4	4	3	4	3
	$G^{(16)}_{9,25}$	$G^{(17)}_{9,25}$	$G^{(18)}_{9,25}$	$G^{(19)}_{9,25}$				
α	1	1	2	2				
β	3	3	3	3				
γ	0	2	0	1				
δ	2	0	1	0				
ϵ	4	4	4	4				

Markings of fatgraphs with trivial automorphisms

This appendix shows the numbering of marked fatgraphs when the base unmarked fatgraph G has only the trivial automorphism.

	$G^{(0)}$	$G^{(1)}$	$G^{(2)}$	$G^{(3)}$	$G^{(4)}$	$G^{(5)}$	$G^{(6)}$	$G^{(7)}$
α	0	0	0	0	0	0	0	0
β	1	1	1	1	1	1	2	2
γ	2	2	3	3	4	4	1	1
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(8)}$	$G^{(9)}$	$G^{(10)}$	$G^{(11)}$	$G^{(12)}$	$G^{(13)}$	$G^{(14)}$	$G^{(15)}$
α	0	0	0	0	0	0	0	0
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	1	1	2	2
δ	1	4	1	3	2	4	1	4
ϵ	4	1	3	1	4	2	4	1
	$G^{(16)}$	$G^{(17)}$	$G^{(18)}$	$G^{(19)}$	$G^{(20)}$	$G^{(21)}$	$G^{(22)}$	$G^{(23)}$
α	0	0	0	0	0	0	0	0
β	3	3	4	4	4	4	4	4

(continued.)

γ	4	4	1	1	2	2	3	3
δ	1	2	2	3	1	3	1	2
ϵ	2	1	3	2	3	1	2	1
	$G^{(24)}$	$G^{(25)}$	$G^{(26)}$	$G^{(27)}$	$G^{(28)}$	$G^{(29)}$	$G^{(30)}$	$G^{(31)}$
α	1	1	1	1	1	1	1	1
β	0	0	0	0	0	0	2	2
γ	2	2	3	3	4	4	0	0
δ	3	4	2	4	2	3	3	4
ϵ	4	3	4	2	3	2	4	3
	$G^{(32)}$	$G^{(33)}$	$G^{(34)}$	$G^{(35)}$	$G^{(36)}$	$G^{(37)}$	$G^{(38)}$	$G^{(39)}$
α	1	1	1	1	1	1	1	1
β	2	2	2	2	3	3	3	3
γ	3	3	4	4	0	0	2	2
δ	0	4	0	3	2	4	0	4
ϵ	4	0	3	0	4	2	4	0
	$G^{(40)}$	$G^{(41)}$	$G^{(42)}$	$G^{(43)}$	$G^{(44)}$	$G^{(45)}$	$G^{(46)}$	$G^{(47)}$
α	1	1	1	1	1	1	1	1
β	3	3	4	4	4	4	4	4
γ	4	4	0	0	2	2	3	3
δ	0	2	2	3	0	3	0	2
ϵ	2	0	3	2	3	0	2	0
	$G^{(48)}$	$G^{(49)}$	$G^{(50)}$	$G^{(51)}$	$G^{(52)}$	$G^{(53)}$	$G^{(54)}$	$G^{(55)}$
α	2	2	2	2	2	2	2	2
β	0	0	0	0	0	0	1	1
γ	1	1	3	3	4	4	0	0
δ	3	4	1	4	1	3	3	4
ϵ	4	3	4	1	3	1	4	3
	$G^{(56)}$	$G^{(57)}$	$G^{(58)}$	$G^{(59)}$	$G^{(60)}$	$G^{(61)}$	$G^{(62)}$	$G^{(63)}$
α	2	2	2	2	2	2	2	2
β	1	1	1	1	3	3	3	3
γ	3	3	4	4	0	0	1	1
δ	0	4	0	3	1	4	0	4
ϵ	4	0	3	0	4	1	4	0
	$G^{(64)}$	$G^{(65)}$	$G^{(66)}$	$G^{(67)}$	$G^{(68)}$	$G^{(69)}$	$G^{(70)}$	$G^{(71)}$
α	2	2	2	2	2	2	2	2
β	3	3	4	4	4	4	4	4
γ	4	4	0	0	1	1	3	3
δ	0	1	1	3	0	3	0	1
ϵ	1	0	3	1	3	0	1	0
	$G^{(72)}$	$G^{(73)}$	$G^{(74)}$	$G^{(75)}$	$G^{(76)}$	$G^{(77)}$	$G^{(78)}$	$G^{(79)}$
α	3	3	3	3	3	3	3	3
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	4	4	0	0
δ	2	4	1	4	1	2	2	4
ϵ	4	2	4	1	2	1	4	2

(continued.)

	$G^{(80)}$	$G^{(81)}$	$G^{(82)}$	$G^{(83)}$	$G^{(84)}$	$G^{(85)}$	$G^{(86)}$	$G^{(87)}$
α	3	3	3	3	3	3	3	3
β	1	1	1	1	2	2	2	2
γ	2	2	4	4	0	0	1	1
δ	0	4	0	2	1	4	0	4
ϵ	4	0	2	0	4	1	4	0
	$G^{(88)}$	$G^{(89)}$	$G^{(90)}$	$G^{(91)}$	$G^{(92)}$	$G^{(93)}$	$G^{(94)}$	$G^{(95)}$
α	3	3	3	3	3	3	3	3
β	2	2	4	4	4	4	4	4
γ	4	4	0	0	1	1	2	2
δ	0	1	1	2	0	2	0	1
ϵ	1	0	2	1	2	0	1	0
	$G^{(96)}$	$G^{(97)}$	$G^{(98)}$	$G^{(99)}$	$G^{(100)}$	$G^{(101)}$	$G^{(102)}$	$G^{(103)}$
α	4	4	4	4	4	4	4	4
β	0	0	0	0	0	0	1	1
γ	1	1	2	2	3	3	0	0
δ	2	3	1	3	1	2	2	3
ϵ	3	2	3	1	2	1	3	2
	$G^{(104)}$	$G^{(105)}$	$G^{(106)}$	$G^{(107)}$	$G^{(108)}$	$G^{(109)}$	$G^{(110)}$	$G^{(111)}$
α	4	4	4	4	4	4	4	4
β	1	1	1	1	2	2	2	2
γ	2	2	3	3	0	0	1	1
δ	0	3	0	2	1	3	0	3
ϵ	3	0	2	0	3	1	3	0
	$G^{(112)}$	$G^{(113)}$	$G^{(114)}$	$G^{(115)}$	$G^{(116)}$	$G^{(117)}$	$G^{(118)}$	$G^{(119)}$
α	4	4	4	4	4	4	4	4
β	2	2	3	3	3	3	3	3
γ	3	3	0	0	1	1	2	2
δ	0	1	1	2	0	2	0	1
ϵ	1	0	2	1	2	0	1	0