aggregations

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elasticsearch.

outline

- what aggregations are
- why we built them
- how they work

  what the trade-offs are

aggregations

- analytics
  histograms, distributions, statistics
- over any partition of your data
  anything that can be selected with queries/filters
- in near real time
  computed on the fly, ~1s refresh interval
- that can be composed
  unlike facets

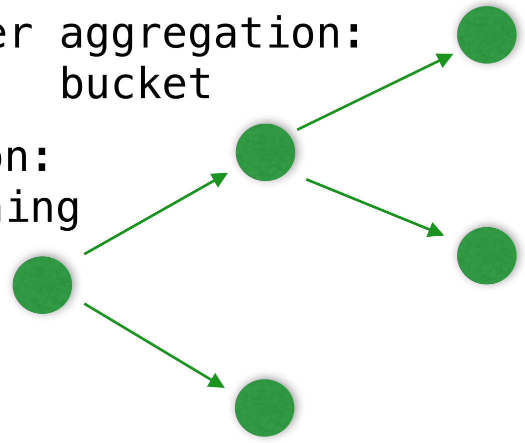
bucket / metrics

- bucket

  terms
  histogram
  range
  filter
  geohash grid

- metrics

  stats
  min / max / avg / sum
  percentiles
  cardinality



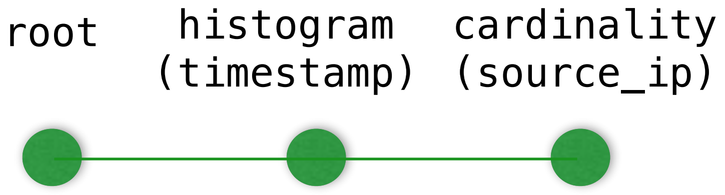
leaf aggregation:
bucket or metric

inner aggregation:
bucket

root aggregation:
collects everything

traffic analysis

```
{
  “source_ip" : “77.104.12.13”,
  “timestamp” : “2014-05-25T23:44:12.779Z”
}
```

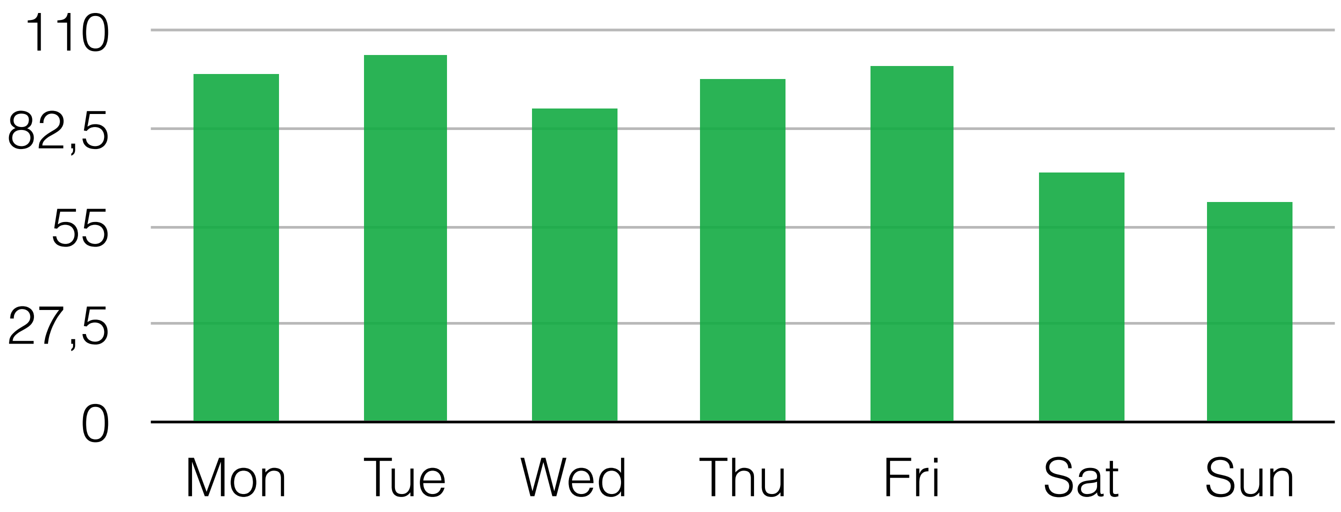


root

histogram
(timestamp)

cardinality
(source_ip)

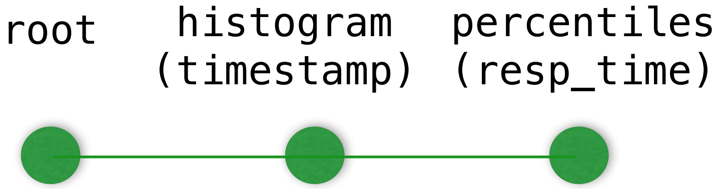
Unique visitors per day



elasticsearch.

performance analysis

```
{
  “resp_time” : 205,
  “timestamp” : “2014-05-25T23:44:12.779Z”
}
```

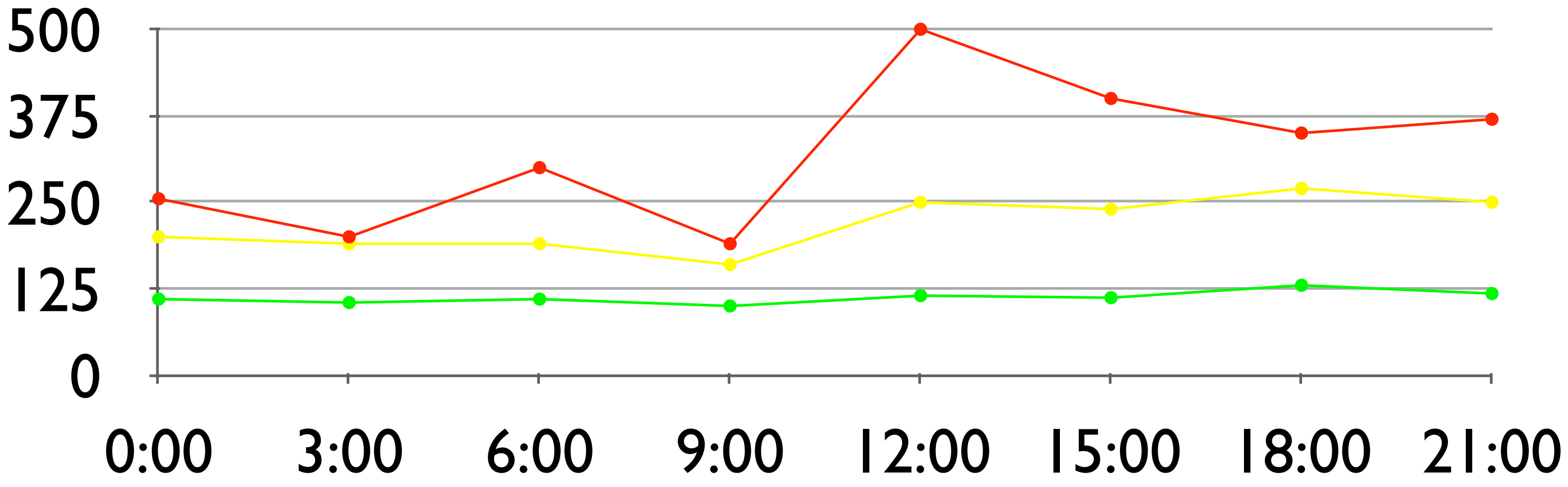


root

histogram
(timestamp)

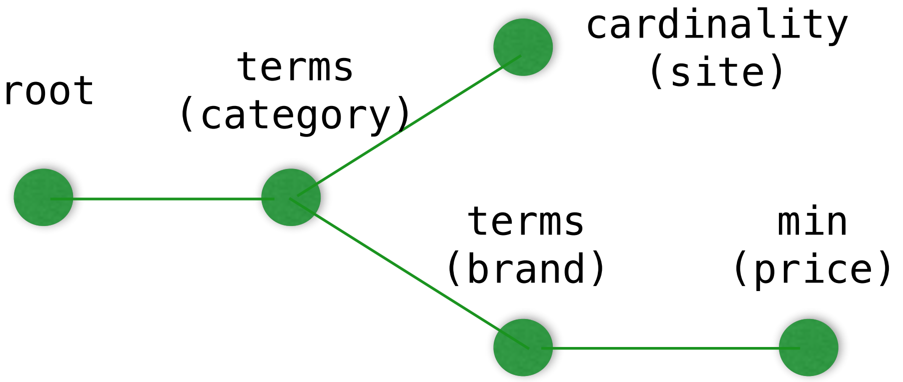
percentiles
(resp_time)

Median, 90th, 99th percentiles over time



e-commerce

```
{
    “category” : “Dresses”,
   “site” : “Zalando”,
    “brand” : “Desigual”,
    “designation”: “dress”,
    “price”: 85
}
```



- Dresses: 23 offers, 9 sites
    - Urbanist: 12   min_price: 60
    - Desigual: 8   min_price: 85
    - Life: 3   min_price: 52
- Shoes: 19, 3 sites
- Skirts: 8, 5 sites

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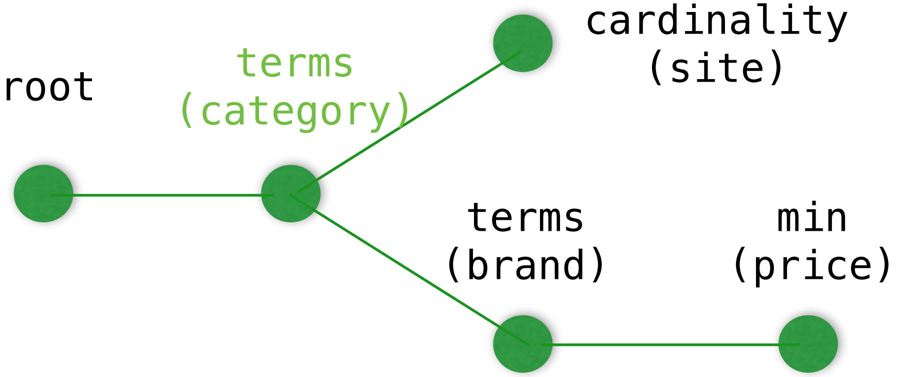

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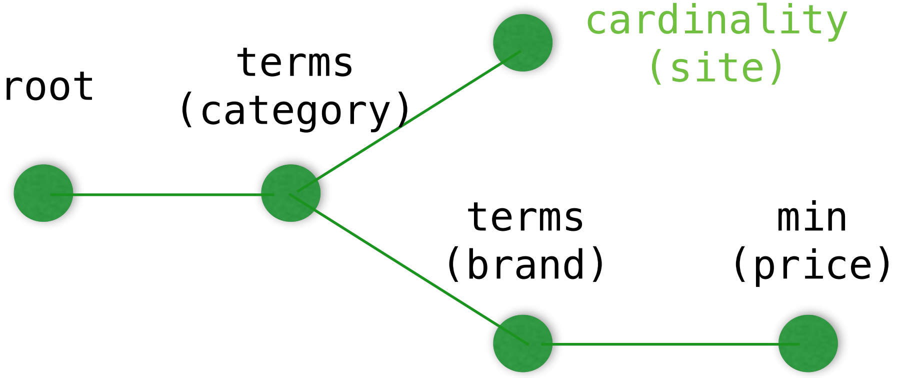

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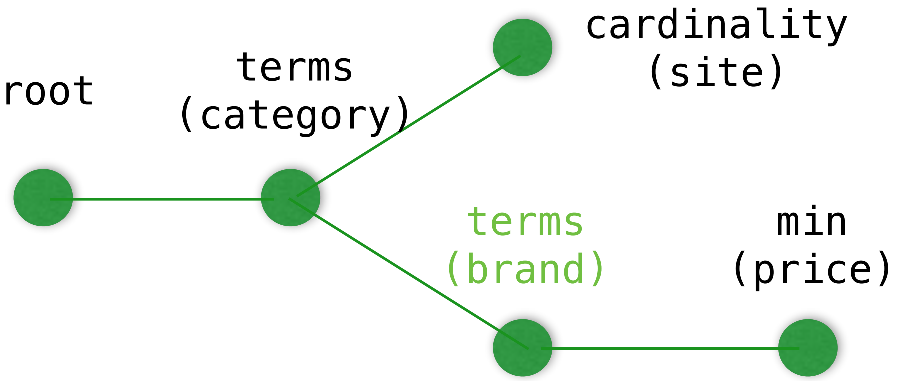

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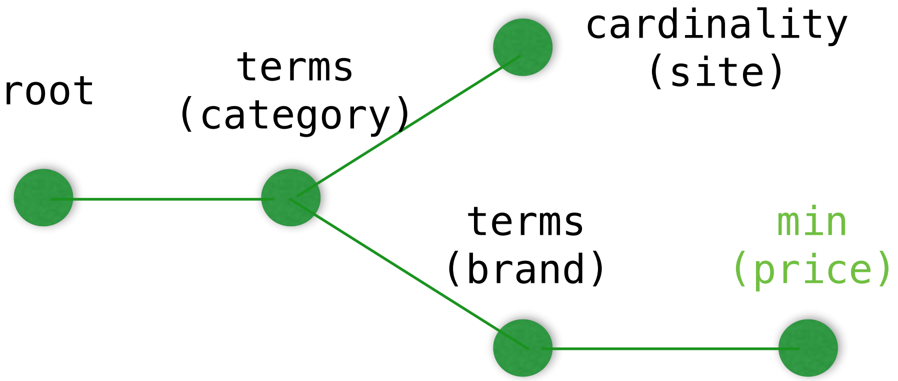

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why on elasticsearch?

- powerful when combined with search
  data exploration

- search engines have had faceted search for a very long time
  storage is optimized for such a workload

- aggregations are a new iteration
  with increased capabilities / flexibility

why is it fast?

- data stored to make information retrieval fast

  yet indexing remains faster than what you expect

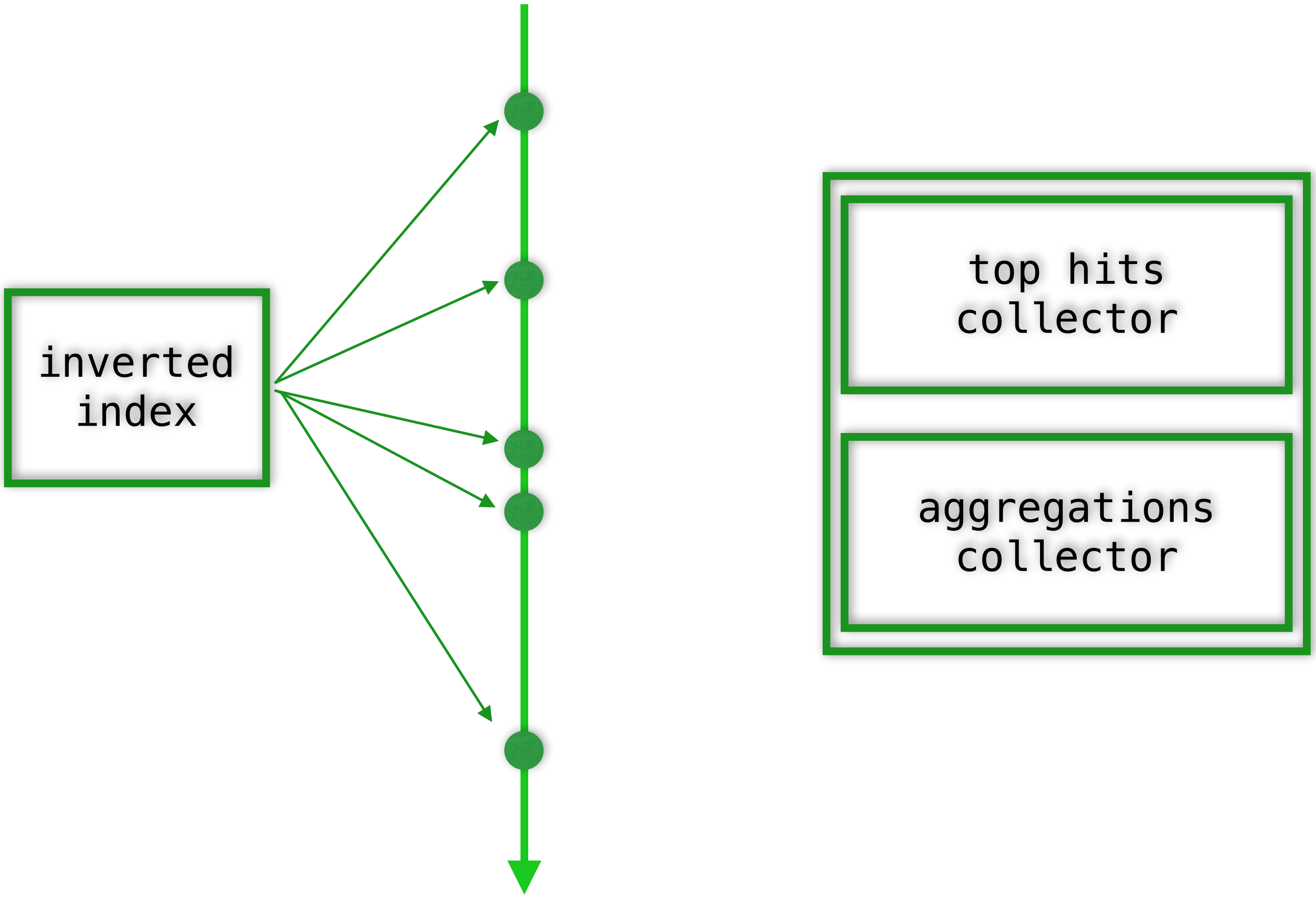
- optimized data structures

  compressed columnar storage (field data / doc values)
  strings are enums (per segment)

- single pass on your data

  no matter how many levels of aggregations there are

how it works (shard level)



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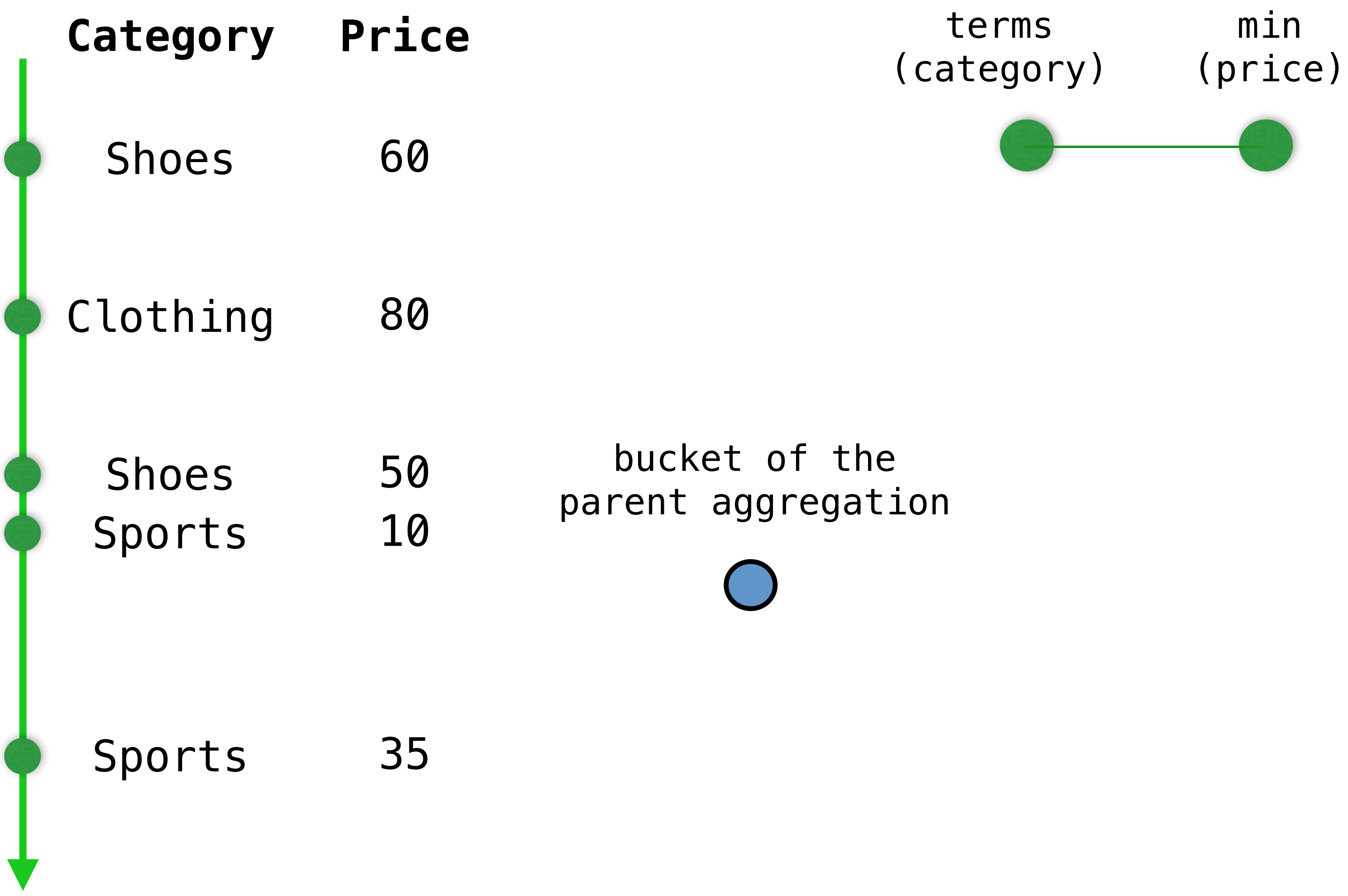


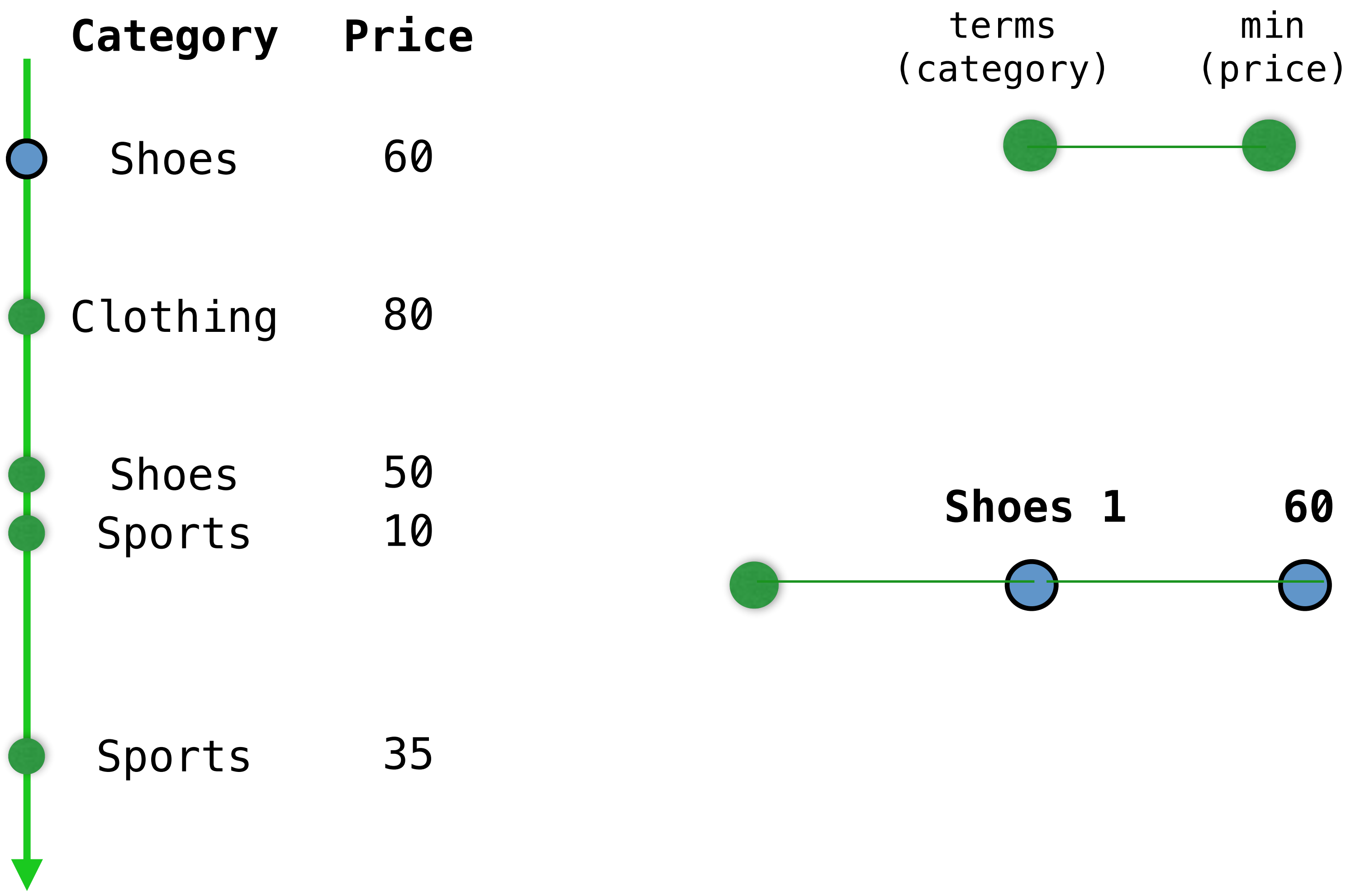
Category	Price
Shoes	60
Clothing	80
Shoes	50
Sports	10
Sports	35

terms (category)

min (price)

bucket of the parent aggregation

how it works (shard level)



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terms
(category)

min
(price)

Shoes 1

60

how it works (shard level)

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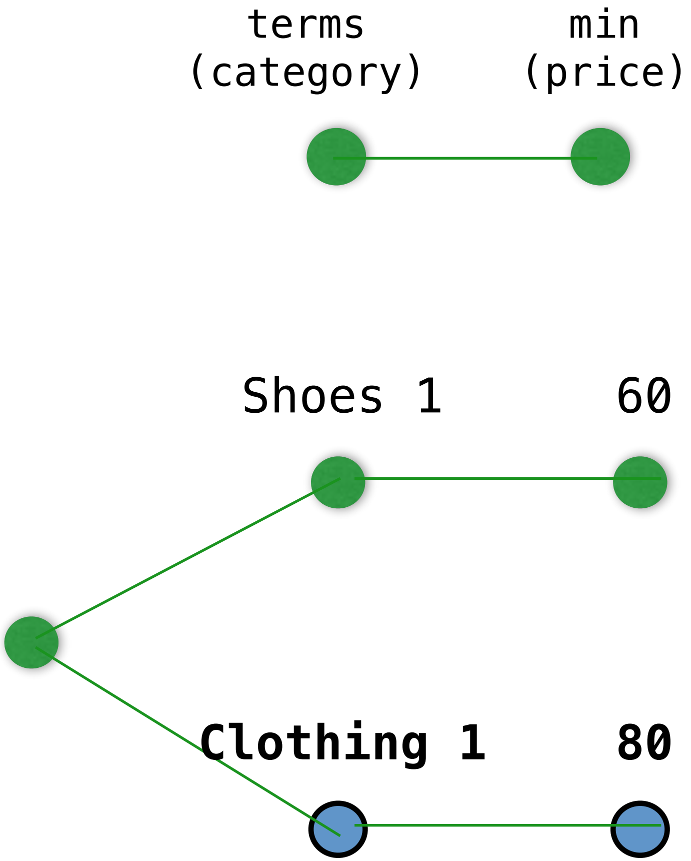


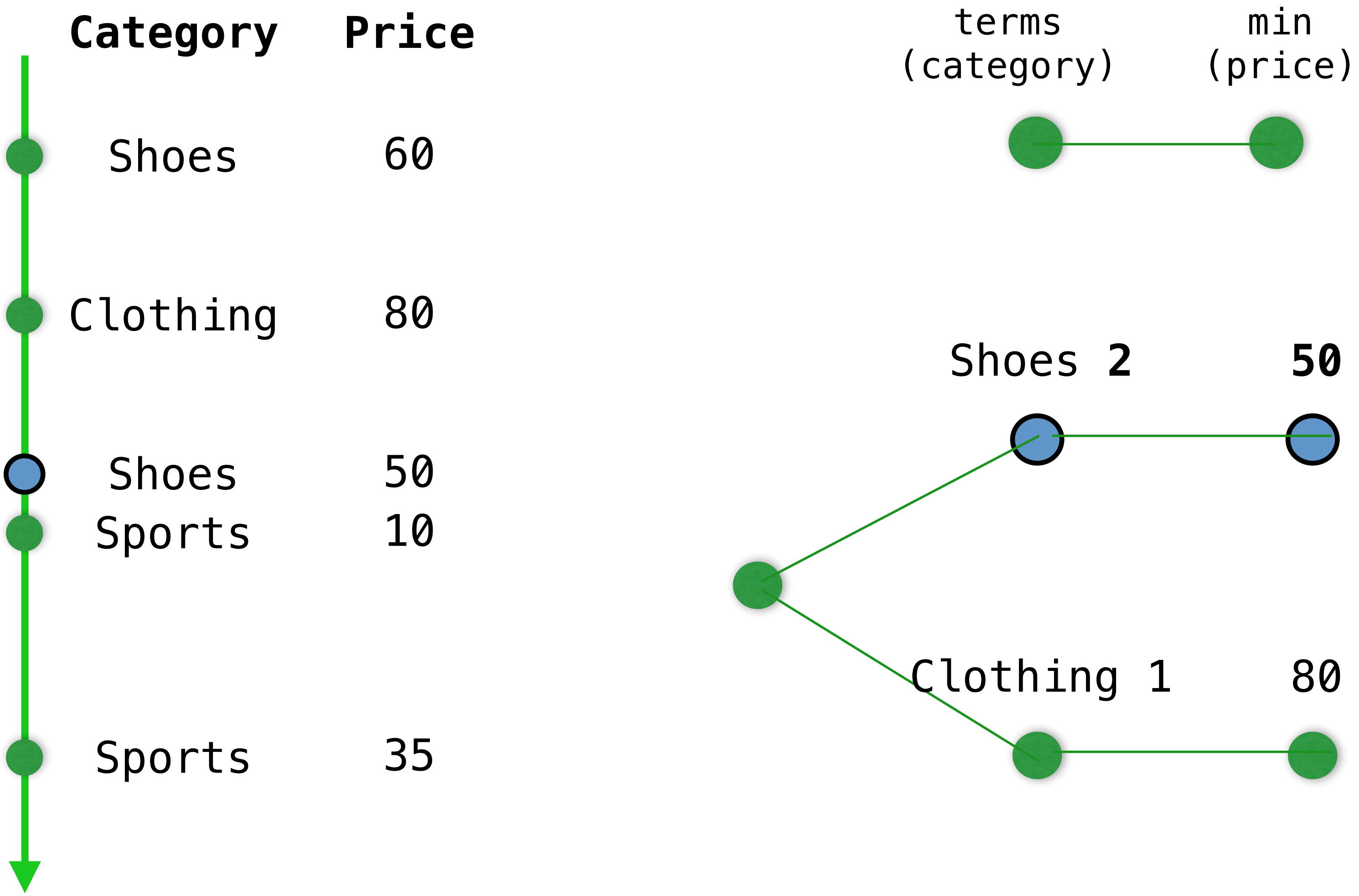
terms
(category)

min
(price)

Shoes 1 60

Clothing 1 80

how it works (shard level)



Category	Price
Shoes	60
Clothing	80
Shoes	50
Sports	10
Sports	35

terms (category)	min (price)
Shoes **2**	**50**
Clothing 1	80

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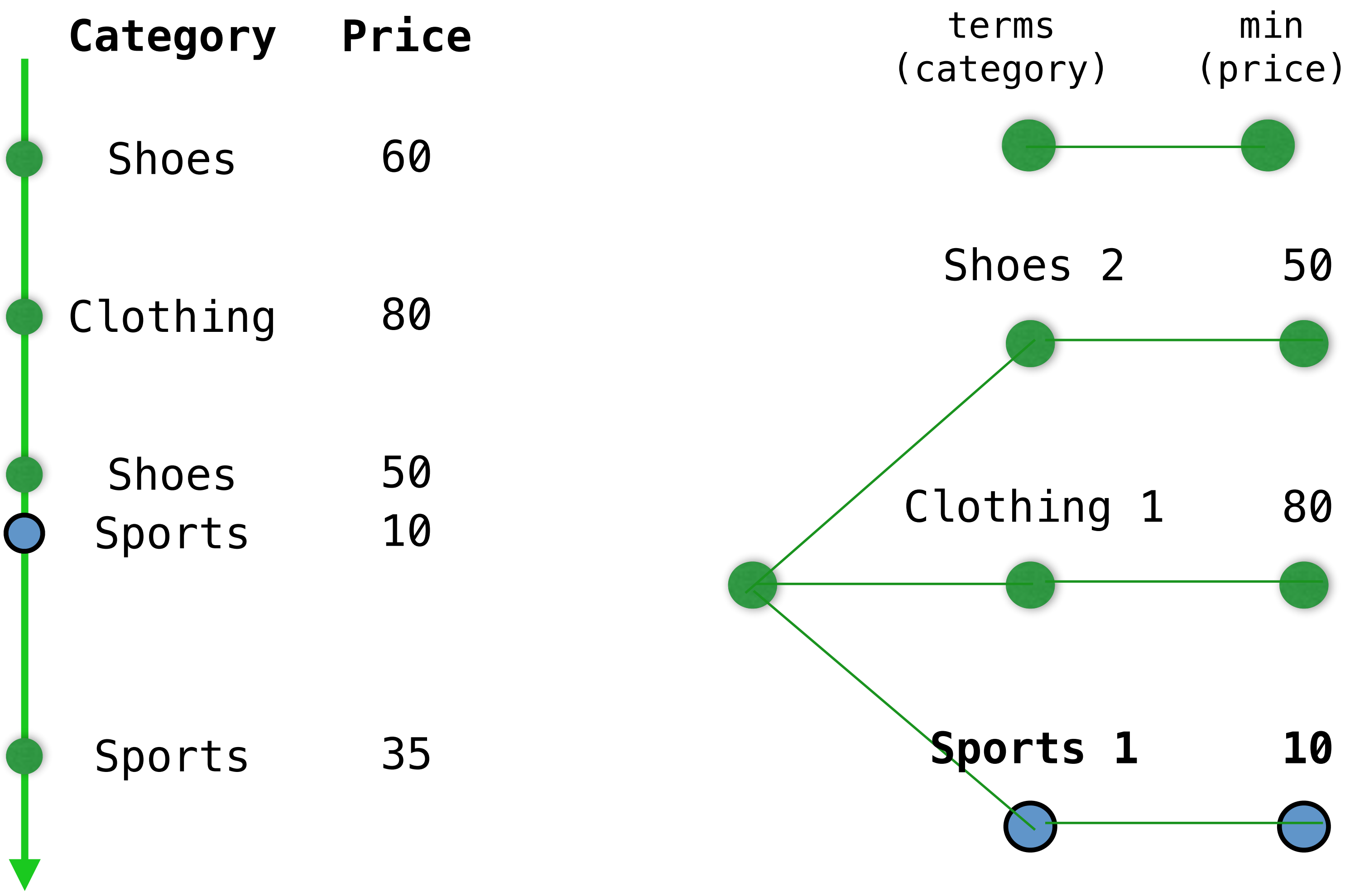

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Clothing 1	80
Sports 1	**10**

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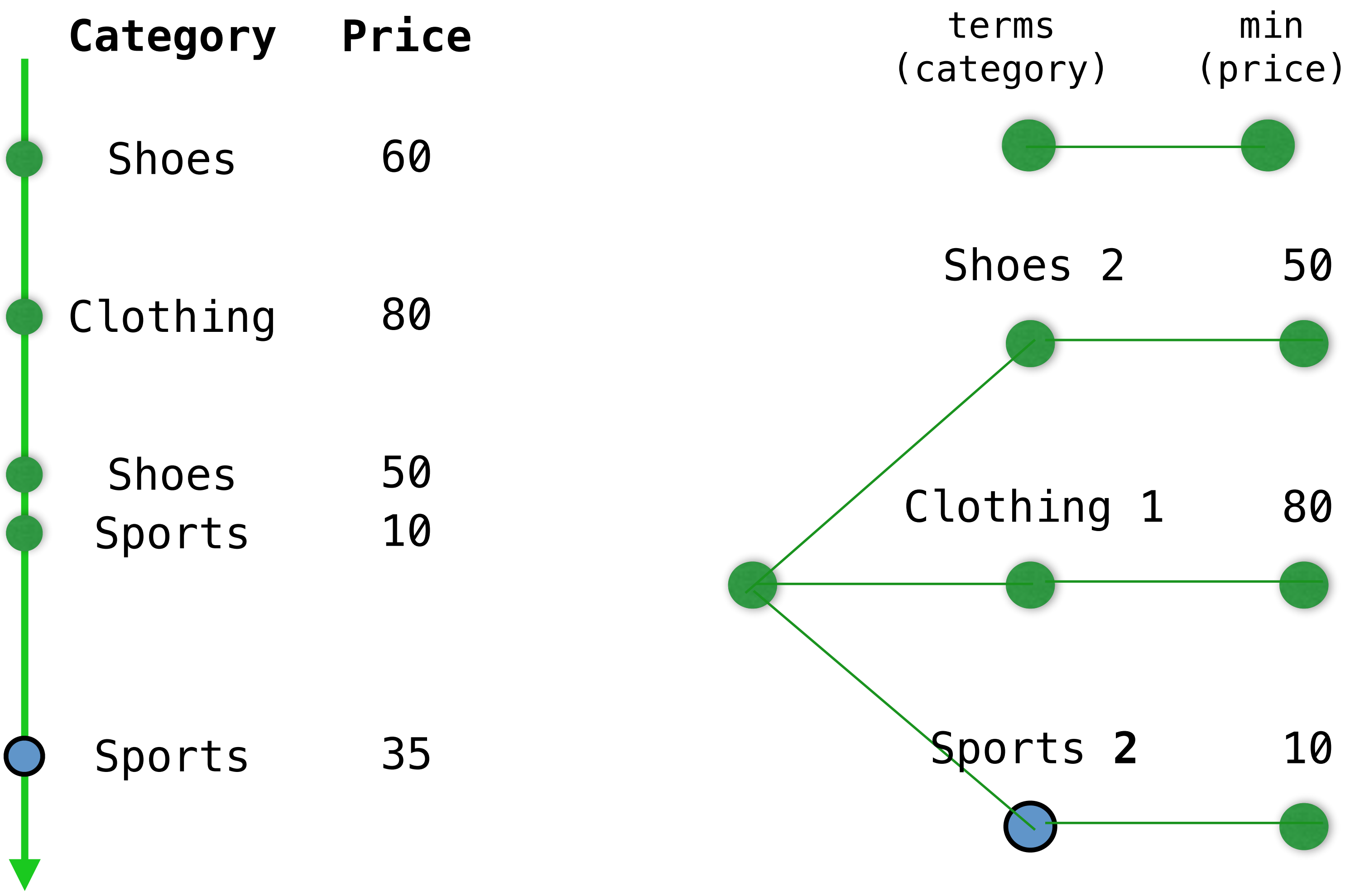
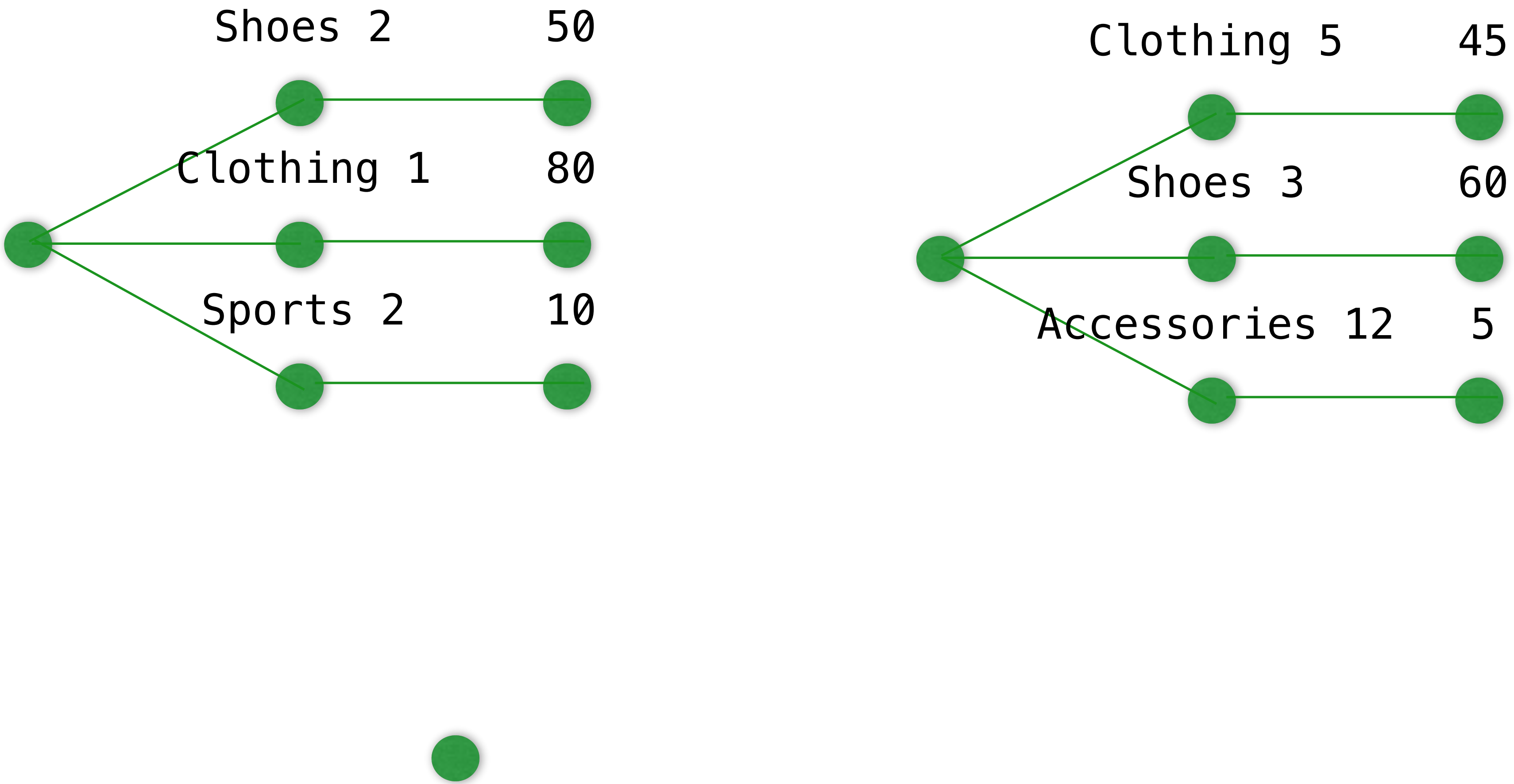


Category	Price
Shoes	60
Clothing	80
Shoes	50
Sports	10
Sports	35

terms (category)	min (price)
Shoes 2	50
Clothing 1	80
Sports **2**	10

how it works (cluster level)



Shoes 2 50

Clothing 1 80

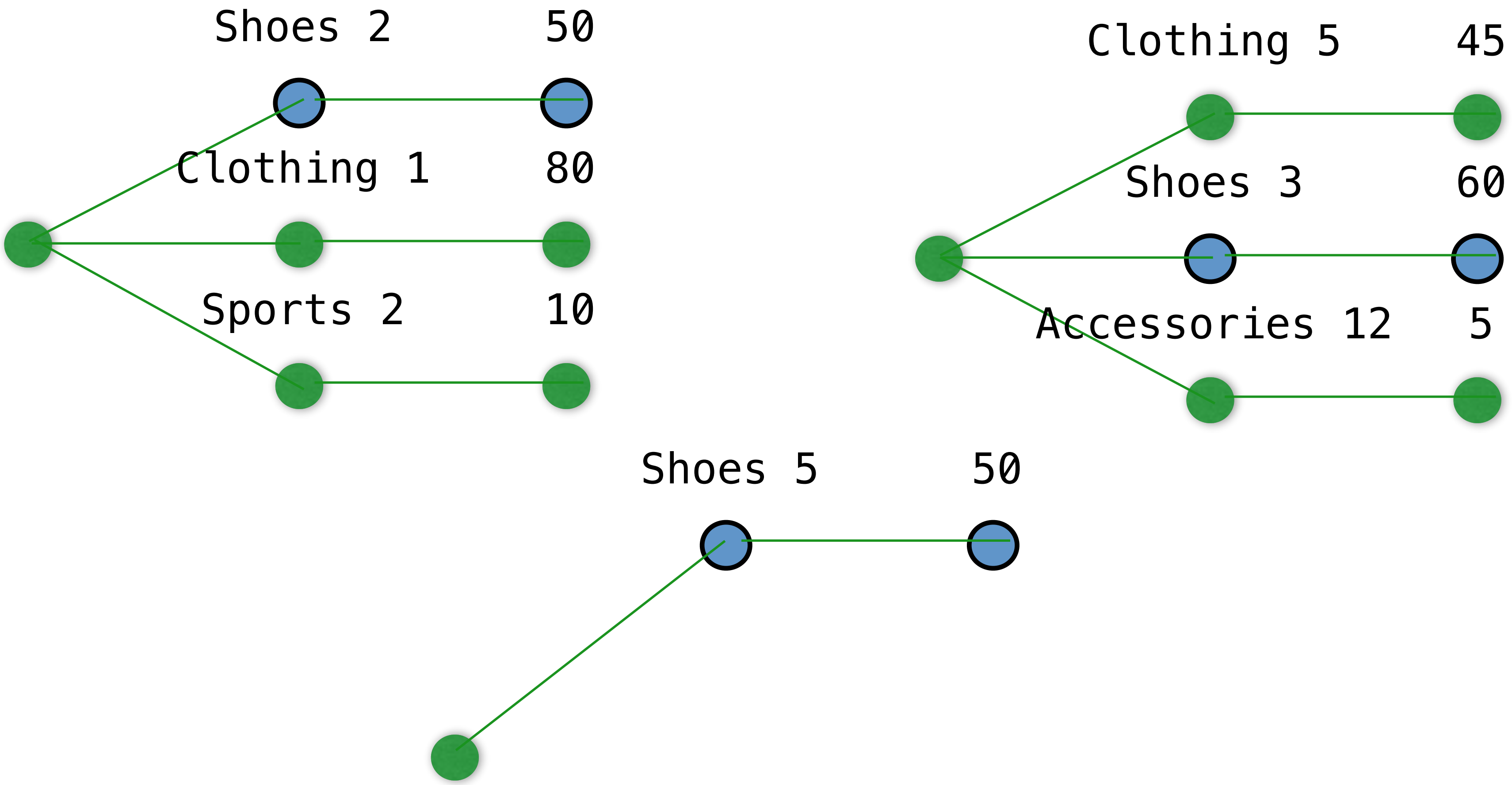
Sports 2 10

Clothing 5 45

Shoes 3 60

Accessories 12 5

how it works (cluster level)



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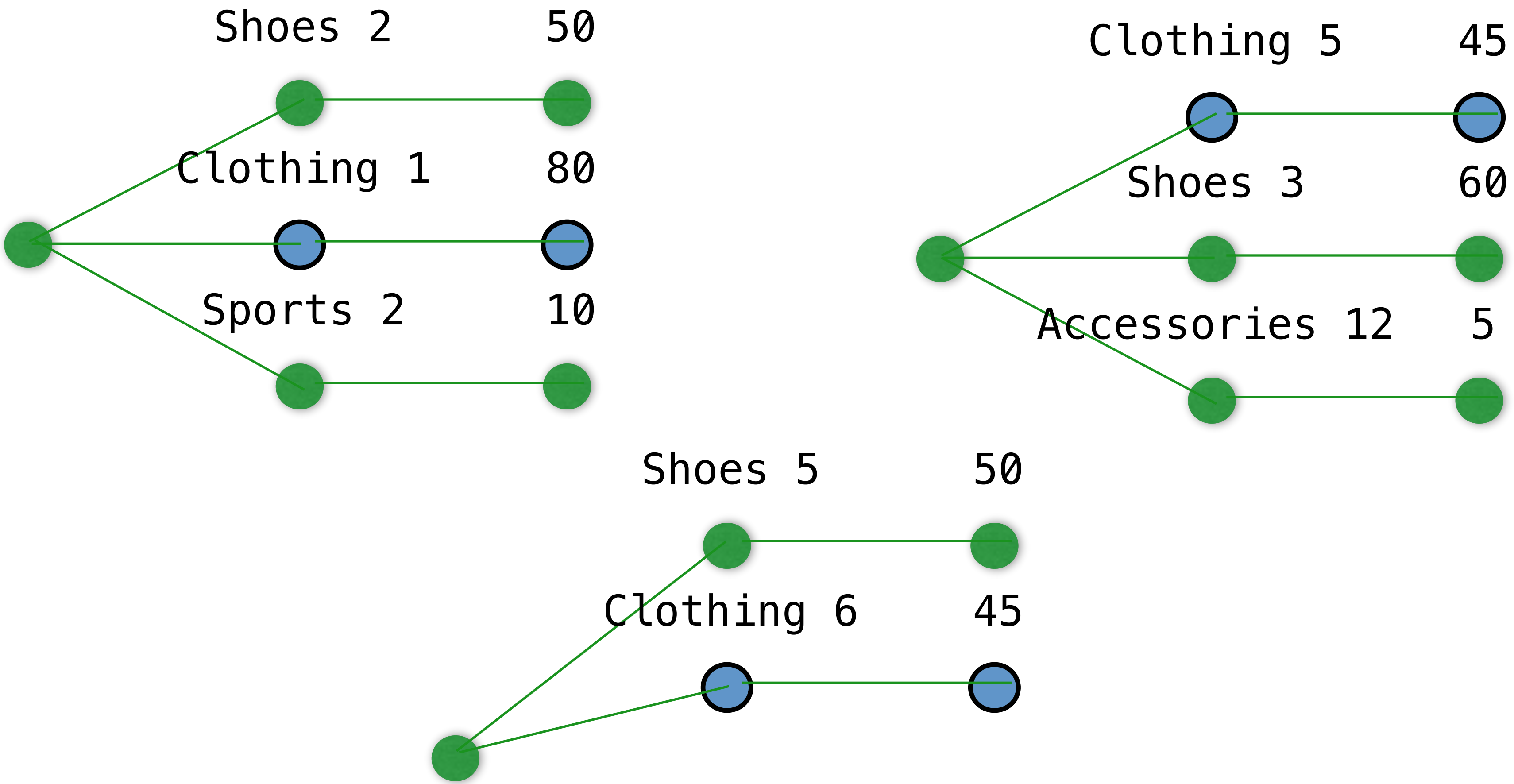

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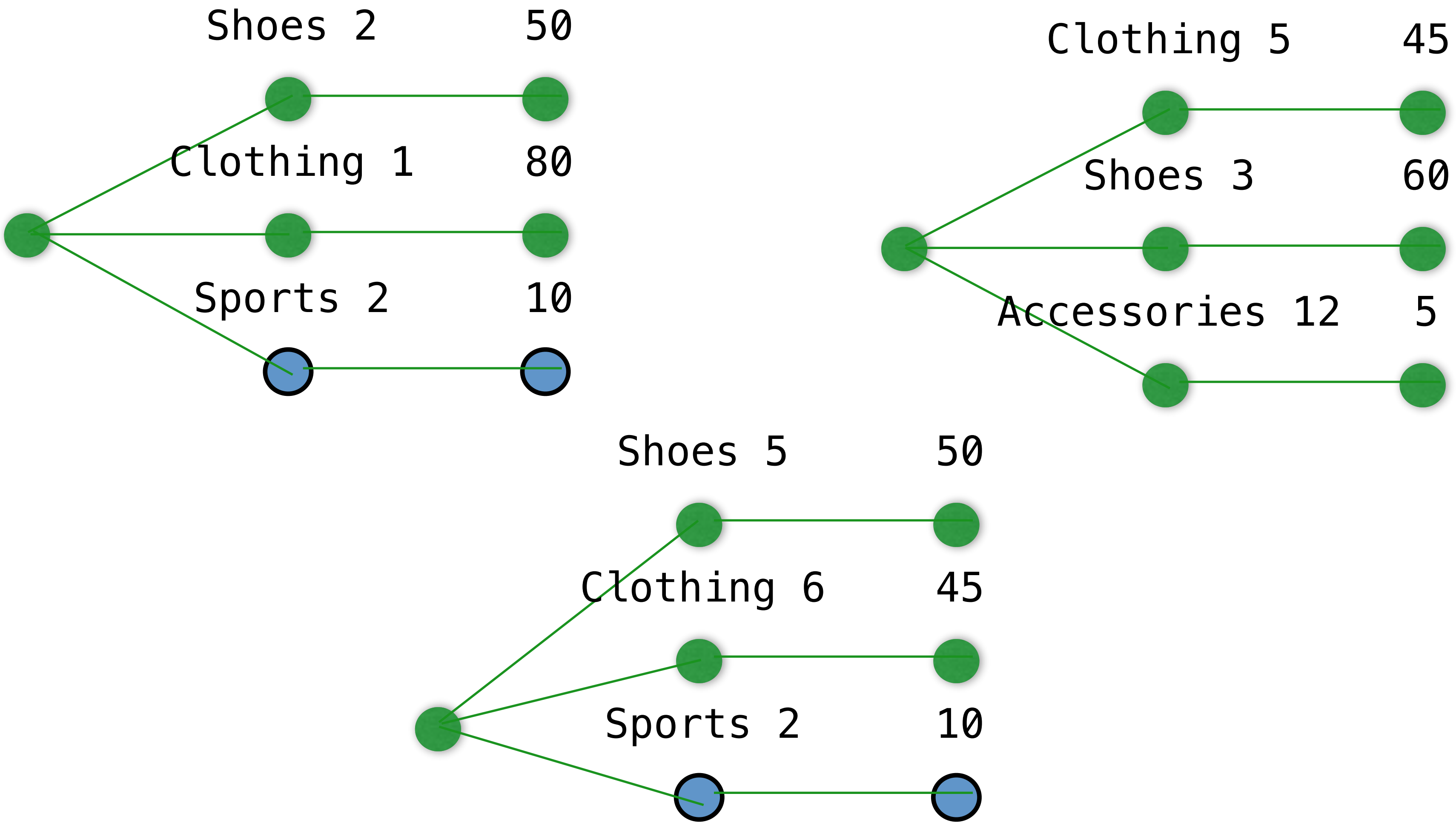

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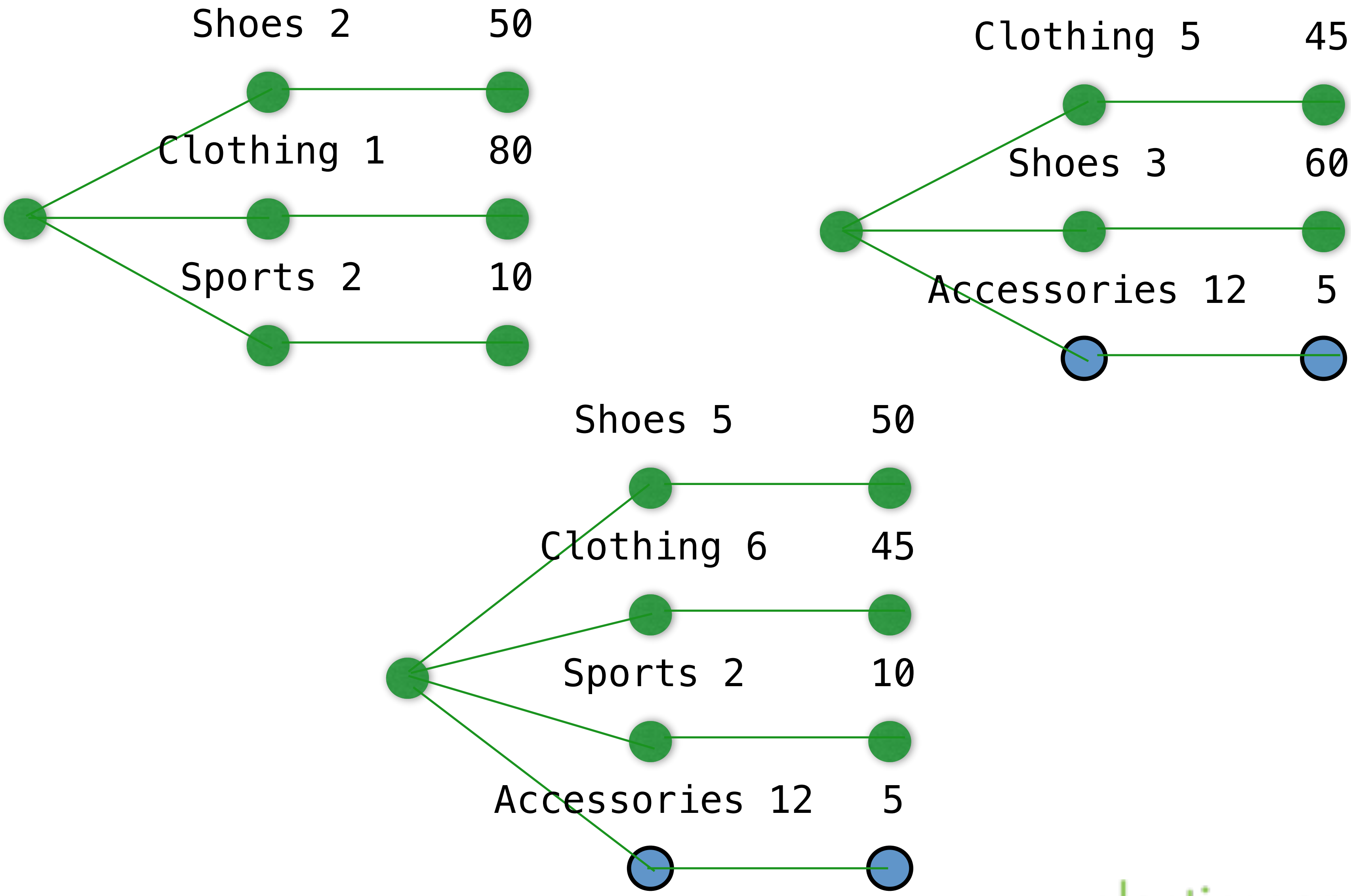

Shoes 2 50

Clothing 1 80

Sports 2 10

Clothing 5 45

Shoes 3 60

Accessories 12 5

Shoes 5 50

Clothing 6 45

Sports 2 10

Accessories 12 5

goodies

- support for document relations

  via nested documents and the nested/reverse_nested aggs

  no parent/child support (yet?)

- significant_terms

  find the uncommonly common

- upcoming top_hits aggregations in 1.3

  compute top hits on each bucket

- performance / memory usage improved in 1.2

  Upgrade if you rely on aggregations

thank you!