



??

- [illegible]



??"???"?????????????  
 ??????????????????????????????



?????.png



- |  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

```
[{
  year: '1951 □ ',
  sales: 38
}, {
  year: '1952 □ ',
  sales: 52
}, {
  year: '1956 □ ',
  sales: 61
}, {
  year: '1957 □ ',
  sales: 145
}, {
  year: '1958 □ ',
  sales: 48
}, {
  year: '1959 □ ',
  sales: 38
}, {
  year: '1960 □ ',
  sales: 38
}
```

```
} , {  
  year: '1962',  
  sales: 38  
}]
```

- 

40,40,60,60

-  Geom

interval ?

??	???
??	year*sales
??	???



?????.png



- 

```
[{
  "name": "London",
  "month": "Jan.",
  "temp": 18.9
}, {
  "name": "London",
  "month": "Feb.",
  "temp": 28.8
}, {
  "name": "London",
  "month": "Mar.",
  "temp": 39.3
}, {
  "name": "London",
  "month": "Apr.",
  "temp": 81.4
}, {
  "name": "London",
  "month": "May",
  "temp": 47
}, {
  "name": "London",
  "month": "Jun.",
```

```
"temp": 20.3
}, {
  "name": "London",
  "month": "Jul.",
  "temp": 24
}, {
  "name": "London",
  "month": "Aug.",
  "temp": 35.6
}, {
  "name": "Berlin",
  "month": "Jan.",
  "temp": 12.4
}, {
  "name": "Berlin",
  "month": "Feb.",
  "temp": 23.2
}, {
  "name": "Berlin",
  "month": "Mar.",
  "temp": 34.5
}, {
  "name": "Berlin",
  "month": "Apr.",
  "temp": 99.7
}, {
  "name": "Berlin",
  "month": "May",
  "temp": 52.6
}, {
  "name": "Berlin",
  "month": "Jun.",
  "temp": 35.5
}, {
  "name": "Berlin",
  "month": "Jul.",
  "temp": 37.4
}, {
  "name": "Berlin",
  "month": "Aug.",
```

```
"[ ]": 42.4
}]
```

- [ ]

```
40, 40, 100, 60
```

- [ ] Geom

interval ?

??	???
??	??*?????
??	???
????	name
????	??   dodge
dodgeRatio	0.5
marginRatio	0.1

- [ ] Legend

??	???
??	??
??	name
??	?
??	??



?????.png




- 

```
[{
  name: 'London',
  'Jan.': 18.9,
  'Feb.': 28.8,
  'Mar.': 39.3,
  'Apr.': 81.4,
  'May': 47,
  'Jun.': 20.3,
  'Jul.': 24,
  'Aug.': 35.6
}, {
  name: 'Berlin',
  'Jan.': 12.4,
  'Feb.': 23.2,
  'Mar.': 34.5,
  'Apr.': 99.7,
  'May': 52.6,
  'Jun.': 35.5,
  'Jul.': 37.4,
  'Aug.': 42.4
}]
```

- 

40, 40, 100, 60

- 

## Transform

?????fold?

??	???
??	????
??????	Jan.,Feb.,Mar.,Apr.,May,Jun.,Jul.,Aug.
	name
key	key
value	value

- ? Geom

???? interval ?

??	???
??	key*value
??	???d
????	name
????	??   stack

- ?? Legend

??	???
??	??
??	key
??	?
??	??







?????.png



- 

```
[{
  x: '   ',
  y: [76, 100]
}, {
  x: '   ',
  y: [56, 108]
}, {
  x: '   ',
  y: [38, 129]
}, {
  x: '   ',
  y: [58, 155]
}, {
  x: '   ',
  y: [45, 120]
}, {
  x: '   ',
  y: [23, 99]
}, {
  x: '   ',
  y: [18, 56]
}, {
  x: '   ',
```

y: [18, 34]  
}]

• 

40, 40, 60, 60

• ? Geom

???? interval ?

??	???
??	x*y
??	???



?????.png



- 

```
[{
  country: '██ ',
  population: 18203
}, {
  country: '██ ',
  population: 23489
}, {
  country: '██ ',
  population: 29034
}, {
  country: '██ ',
  population: 104970
}, {
  country: '██ ',
  population: 131744
}]
```

- 

40, 60, 60, 70

• ? Geom

???? interval ?

??	???
??	country*population
??	???

• ??? Coord

??	???
??	?????
??	true



?????.png



- 

```
[{
  "label": "Mon.",
  "type": "series1",
  "value": 2800
}, {
  "label": "Mon.",
  "type": "series2",
  "value": 2260
}, {
  "label": "Tues.",
  "type": "series1",
  "value": 1800
}, {
  "label": "Tues.",
  "type": "series2",
  "value": 1300
}, {
  "label": "Wed.",
  "type": "series1",
  "value": 950
}, {
  "label": "Wed.",
  "type": "series2",
```

```
  "value": 900
}, {
  "label": "Thur.",
  "type": "series1",
  "value": 500
}, {
  "label": "Thur.",
  "type": "series2",
  "value": 390
}, {
  "label": "Fri.",
  "type": "series1",
  "value": 170
}, {
  "label": "Fri.",
  "type": "series2",
  "value": 100
}]
```

- 

40, 60, 80, 70

- ??? Axis

value?Y??

??	???
??	value
??	??
??	right

- ? Geom

???? interval ?

??	???
----	-----

??	label*value
??	???
????	type
????	??   dodge
dodgeRatio	0.35
marginRatio	0.5

• ?? Legend

??	???
??	??
??	type
??	?
??	??

• ??? Coord

??	???
??	?????
??	Y
??	true





?????.png



- |  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

```
[{
  'State': 'WY',
  '1990 50 ': 25635,
  '50 130 ': 1890,
  '140 170 ': 9314
}, {
  'State': 'DC',
  '1990 50 ': 30352,
  '50 130 ': 20439,
  '140 170 ': 10225
}, {
  'State': 'VT',
  '1990 50 ': 38253,
  '50 130 ': 42538,
  '140 170 ': 15757
}, {
  'State': 'ND',
  '1990 50 ': 51896,
  '50 130 ': 67358,
  '140 170 ': 18794
}, {
  'State': 'AK',
  '1990 50 ': 72083,
```

```
'5 13 ': 85640,
'14 17 ': 22153
}]
```

• 

40, 60, 80, 70

• ?????? Transform

?????fold?

??	???
??	????
??????	??5?,5?13?,14?17?
????	State
key	???
value	????

• ? Geom

???? interval ?

??	???
??	State*????
??	???
????	???
????	??   stack

## • ?? Legend

??	???
??	??
??	???
??	?
??	??

## • ??? Coord

??	???
??	?????
??	true



?????.png



- 

```
[{
  profession: 'Engineer',
  highest: 110000,
  minimum: 23000,
  mean: 56636
}, {
  profession: 'Teacher',
  highest: 120000,
  minimum: 18000,
  mean: 66625
}, {
  profession: 'Doctor',
  highest: 125000,
  minimum: 24000,
  mean: 72536
}, {
  profession: 'Lawyer',
  highest: 130000,
  minimum: 22500,
  mean: 75256
}, {
  profession: 'Artist',
  highest: 131000,
```

```
    minimum: 23000,  
    mean: 77031  
  }  
}
```

- 

20, 80, 50, 150

- ?????? Transform

 map

??	???
??	????
????	<div><pre>function callback(row) {   row.range = [row.minimum, row.highest];   return row; }</pre></div>

- ? Geom

???? interval ?

??	???
??	profession*range
??	???

- ??? Coord

??	???
??	?????
??	true