Data Visualization

INF552 - 2023 - Session 03 - exercices
Introduction to Vega-Lite

ÉCOLE POLYTECHNIQUE

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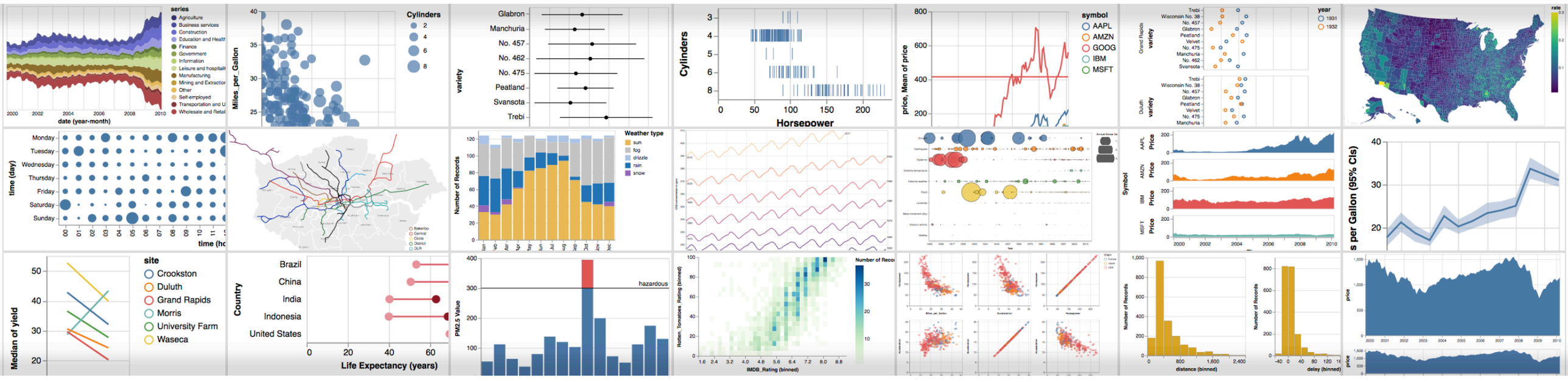


https://vega.github.io/vega-lite/

```
var circle = document.createElementNS(ctx.SVG_NS, "circle");
circle.setAttribute("cx", pos[0]);
circle.setAttribute("cy", pos[1]);
circle.setAttribute("r", ctx.GLYPH_SIZE/2.0);
circle.setAttribute("fill", color);
```

```
var circleGenerator = d3.symbol().type(d3.symbolCircle)
                        .size(6);
d3.selectAll("path")
  .data(someData)
  .enter()
  .append("path")
  .attr("d", circleGenerator());
```

```
"data": {
    "url": "exoplanet.eu_catalog.csv",
},
"mark": "point",
"encoding": {
  "x": {"field": "star_mass", "type": "quantitative"}},
  "y": {"field": "mass", "type": "quantitative"}}
}
```

DOM+JS

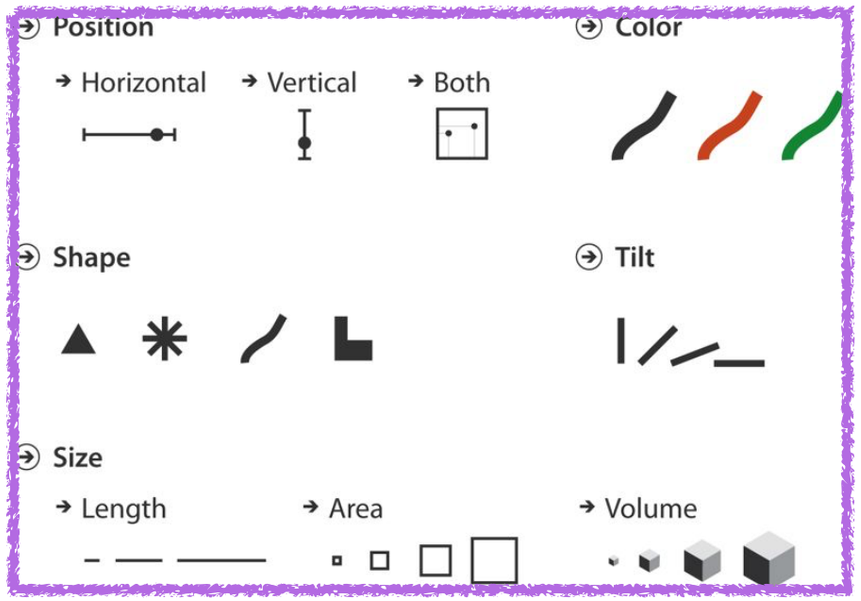
D3

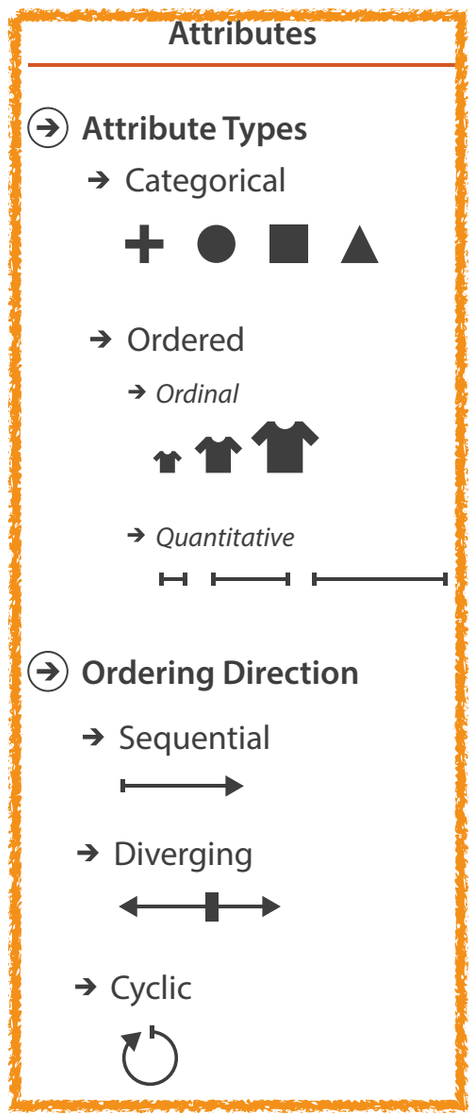
Vega-lite

Level of abstraction

What vega-lite does

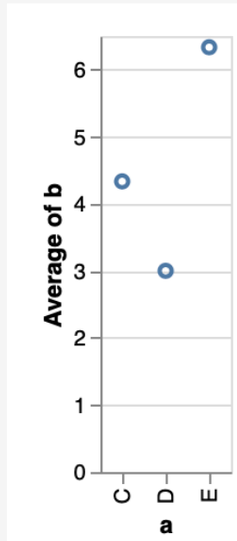
- A *"high-level grammar of interactive graphics"*
- Declarative specification of visualizations, including their behaviour.
- Positioned at a much higher level of abstraction than D3.
    - Uses D3 under the hood (but supports different renderers).
- API reference: `https://vega.github.io/vega-lite/docs/`





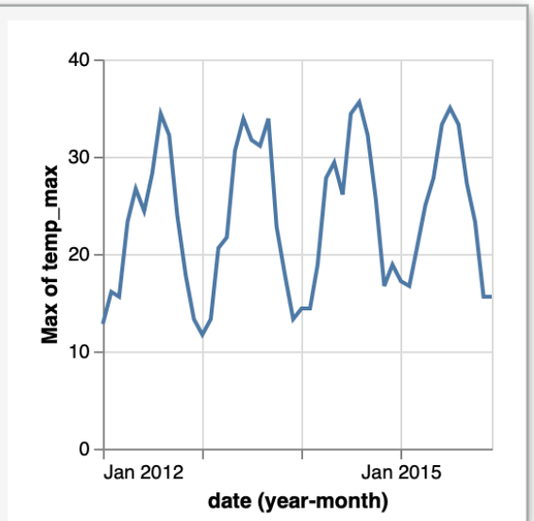
VEGA-LITE CONFIG

```
1   {
2     "$schema": "https://vega.github.io/schema/vega-lite/v4.json",
3     "data": {
4       "values": [
5         {"a": "C", "b": 2}, {"a": "C", "b": 7}, {"a": "C", "b": 4}, {"a":
    "D", "b": 1}, {"a": "D", "b": 2}, {"a": "D", "b": 6}, {"a": "E", "b": 8},
    {"a": "E", "b": 4}, {"a": "E", "b": 7}
6       ]
7     },
8     "mark": "point",
9     "encoding": {
10      "x": {"field": "a", "type": "nominal"},
11      "y": {"aggregate": "average", "field": "b", "type": "quantitative"}
12    }
13  }
```



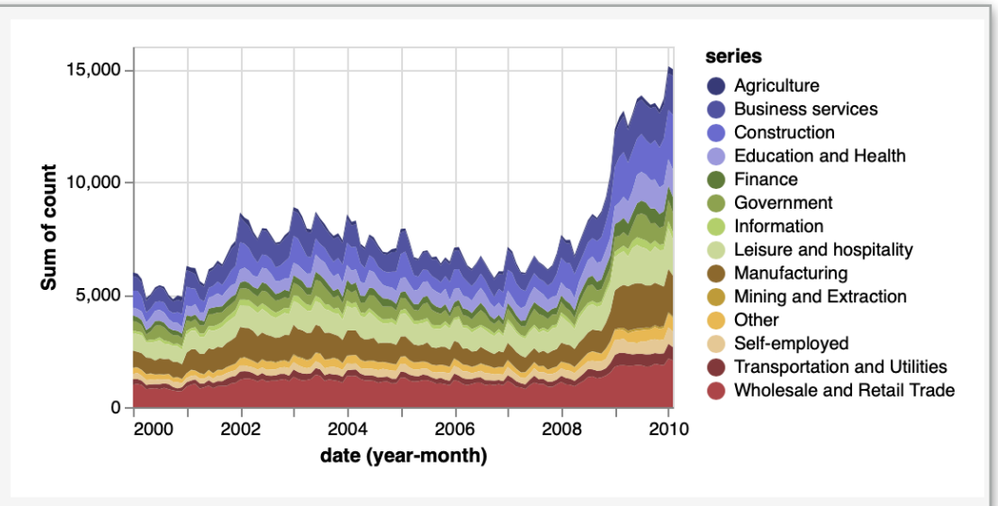
VEGA-LITE CONFIG

```
4     "mark": "line",
5     "encoding": {
6       "x": {"timeUnit": "yearmonth", "field": "date", "type":
    "temporal"},
7       "y": {"aggregate": "max", "field": "temp_max", "type":
    "quantitative"}
8     }
9   }
10
11
12
13
14
```



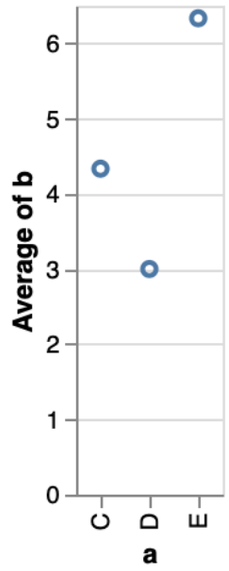
VEGA-LITE CONFIG

```
6     "mark": "area",
7     "encoding": {
8       "x": {
9         "timeUnit": "yearmonth", "field": "date", "type": "temporal",
10        "axis": {"format": "%Y"}
11      },
12      "y": {
13        "aggregate": "sum", "field": "count", "type": "quantitative"
14      },
15      "color":
16        "field": "series",
17        "type": "nominal",
18        "scale": {"scheme": "category20b"}
19      }
```



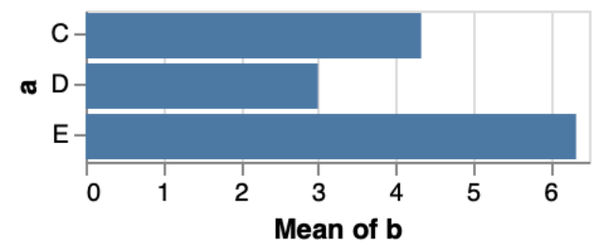
VEGA-LITE CONFIG

```
{
  "$schema": "https://vega.github.io/schema/vega-lite/v4.json",
  "data": {
    "values": [
      {"a": "C", "b": 2}, {"a": "C", "b": 7}, {"a": "C", "b": 4}, {"a": "D", "b": 1}, {"a": "D", "b": 2}, {"a": "D", "b": 6}, {"a": "E", "b": 8}, {"a": "E", "b": 4}, {"a": "E", "b": 7}
    ]
  },
  "mark": "point",
  "encoding": {
    "x": {"field": "a", "type": "nominal"},
    "y": {"aggregate": "average", "field": "b", "type": "quantitative"}
  }
}
```



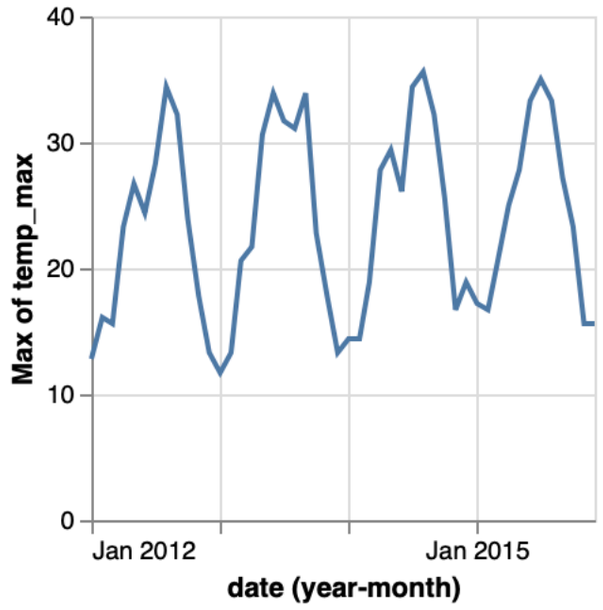
VEGA-LITE CONFIG

```
  "mark": "bar",
  "encoding": {
    "y": {"field": "a", "type": "nominal"},
    "x": {
      "aggregate": "average",
      "field": "b",
      "type": "quantitative",
      "axis": {"title": "Mean of b"}
    }
  }
}
```



VEGA-LITE CONFIG

```
  "mark": "line",
  "encoding": {
    "x": {"timeUnit": "yearmonth", "field": "date", "type": "temporal"},
    "y": {"aggregate": "max", "field": "temp_max", "type": "quantitative"}
  }
}
```



```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8">
        <title>INF552 - 2023 - PC 03</title>
        <!-- https://vega.github.io/vega-lite/ -->
        <script src="https://cdn.jsdelivr.net/npm/vega@5.25.0"></script>
        <script src="https://cdn.jsdelivr.net/npm/vega-lite@5.15.1"></script>
        <script src="https://cdn.jsdelivr.net/npm/vega-embed@6.22.2"></script>
        <!-- Your code -->
        <script src="js/ex03.js"></script>
   </head>

    <body>
      <!-- div that will be populated with the visualization -->
      <div id="vlc"></div>

      <script>
var vlSpec = {
    "$schema": “https://vega.github.io/schema/vega-lite/v5.json",
    "data": {},
    "transform": [],
    "mark": "point",
    "encoding": {}
};
// see options at https://github.com/vega/vega-embed/blob/master/README.md
var vlOpts = {width:720, height:100, actions:false};
vegaEmbed("#vlc", vlSpec, vlOpts);
      </script>
    </body>

</html>
```