Tutorial 8

Graph Visualization

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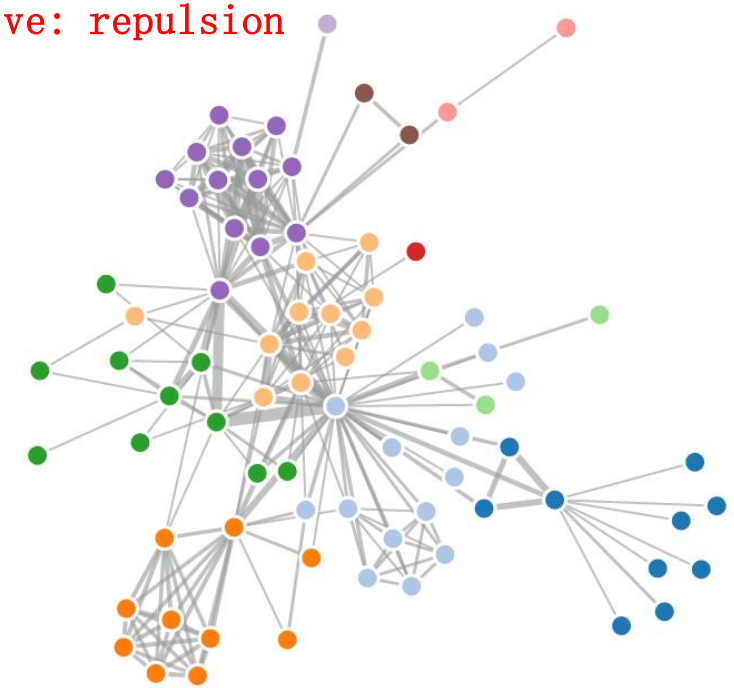
Force-directed Layout

- There can be multiple forces between each pair of nodes.
- The layout is determined by all the forces.

```
var chargeForce = d3.forceManyBody()
    .strength(0.1) //positive: attraction, negative: repulsion
    .distanceMax(500)
    .distanceMin(60);

// Creates a new circle collision force with
// the specified radius
var collideForce = d3.forceCollide()
     .strength(2)
     .radius(20);

var simulation = d3.forceSimulation()
     .force("link", d3.forceLink())
     .force("charge", chargeForce)
     .force('collide', collideForce)
     .force("center", d3.forceCenter(width / 2, height / 2));
```



Note: we are using d3@v7; different versions of d3 can have slightly-different implementations !

Useful References

Official API:
https://github.com/d3/d3/blob/main/API.md#forces-d3-force

https://github.com/d3/d3/blob/main/API.md#forces-d3-force

https://github.com/d3/d3-force/blob/v3.0.0/README.md#forceManyBody

Examples:
https://www.d3indepth.com/force-layout/

https://observablehq.com/@d3/force-directed-graph

Your Task

1. Download the skeleton code

2. General task: finish the code to draw a force-directed graph

```
57          .attr("stroke-width", function(d) {
58            // TO-DO: change the stroke-width as the squre root of the "value" of the current link
59            return 4;
60          });
```

```
70          .attr("fill", function(d) {
71            // TO-DO: revise the code to use different color to represent different groups
72            return 'grey';
73          })
```

Your Task

1. Download the skeleton code

2. General task: finish the code to draw a force-directed graph

3. Play with different parameter settings. Check the function of each parameter.

```
31  // TO-DO:
32  //    1) Try to modify the values of strength, distanceMax and distanceMin, radius and see what will happen
33  //    2) Try to use only "var chargeForce =  d3.forceManyBody()" and see what will happen
34  var chargeForce =  d3.forceManyBody().strength(0.1).distanceMax(500).distanceMin(60);
35  var collideForce = d3.forceCollide().strength(2).radius(20);
36
```

THANK YOU~