DATA VISUALISATION

ASSIGNMENT

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PROTOVIS:

Definition:

Protovis composes custom views of data with simple marks such as bars and dots. Unlike low-level graphics libraries that quickly become tedious for visualization, Protovis defines marks through dynamic properties that encode data, allowing inheritance, scales and layouts to simplify construction.

Types of protovis:

- Marks
- Panles
- Built in types
    I. Lines
    II. Area
    III. Bar
    IV. Dot
    V. Wedge
    VI. Image line
    VII. Label and bar
    VIII. Rule and bar

1.CODE:

```
<html>
  <head>
    <title>My God, it's full of eyes!</title>
    <link rel="stylesheet" type="text/css" href="ex.css"/>
    <script type="text/javascript" src="../protovis-r3.2.js"></script>
    <style type="text/css">

body {
  background: #222;
}
```

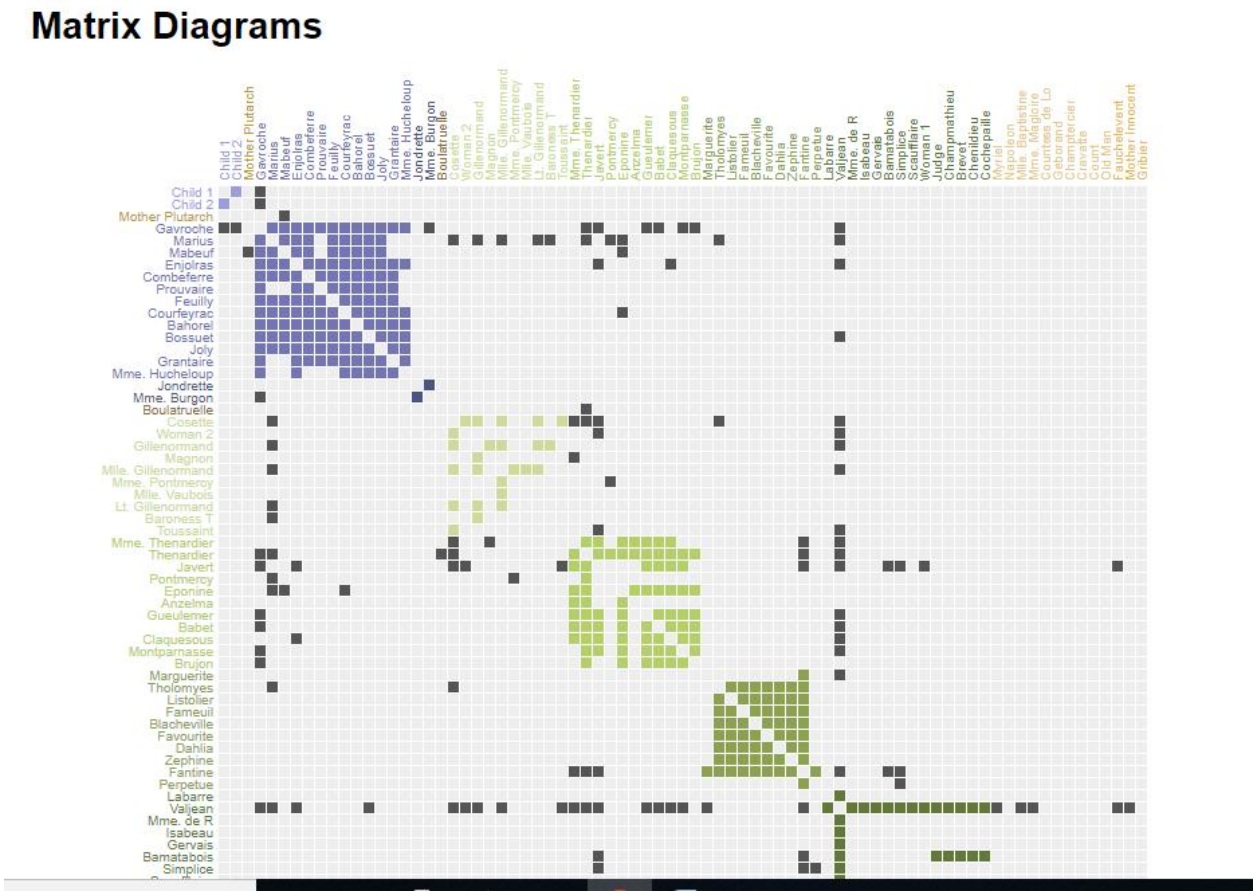
```
#fig {
  width: 200px;
  height: 200px;
}

    </style>
  </head>
  <body><div id="center"><div id="fig">
    <script type="text/javascript+protovis">

var vis = new pv.Panel()
    .width(200)
    .height(200)
    .fillStyle("#666")
    .strokeStyle("#ccc");

vis.add(pv.Panel)
    .data([{x:50, y:16, r:40},
           {x:64, y:85, r:20},
           {x:90, y:200, r:60},
           {x:150, y:44, r:20},
           {x:175, y:120, r:40}])
    .left(function(d) d.x)
    .top(function(d) d.y)
  .add(pv.Dot)
    .fillStyle("#fff")
    .strokeStyle(null)
    .size(function(d) d.r * d.r)
  .add(pv.Dot)
    .def("v", function(d) {
      var m = this.mouse();
      return (m.length() > d.r / 2) ? m.norm().times(d.r / 2) : m;
    })
    .fillStyle("#aaa")
    .left(function(d) this.v().x)
    .top(function(d) this.v().y)
    .size(function(d) d.r * d.r / 4);

vis.render();
pv.listen(self, "mousemove", function() vis.render());

    </script>
  </div></div></body>
</html>
```

Eyes

2.

```
<html>
  <head>
    <title>Matrix Diagram</title>
    <link type="text/css" rel="stylesheet" href="ex.css?3.2"/>
    <script type="text/javascript" src="../protovis-r3.2.js"></script>
    <script type="text/javascript" src="miserables.js"></script>
    <style type="text/css">

#fig {
  width: 800px;
  height: 800px;
}

    </style>
  </head>
  <body><div id="center"><div id="fig">
    <script type="text/javascript+protovis">

var color = pv.Colors.category19().by(function(d) d.group);

var vis = new pv.Panel()
    .width(693)
    .height(693)
    .top(90)
    .left(90);

var layout = vis.add(pv.Layout.Matrix)
    .nodes(miserables.nodes)
    .links(miserables.links)
    .sort(function(a, b) b.group - a.group);

layout.link.add(pv.Bar)
    .fillStyle(function(l) l.linkValue
        ? ((l.targetNode.group == l.sourceNode.group)
        ? color(l.sourceNode) : "#555") : "#eee")
    .antialias(false)
```

```
    .lineWidth(1);

layout.label.add(pv.Label)
    .textStyle(color);

vis.render();

    </script>
  </div></div></body>
</html>
```



3.

```
<html>
  <head>
    <title>Parallel Coordinates</title>
    <link type="text/css" rel="stylesheet" href="ex.css?3.2"/>
    <script type="text/javascript" src="../protovis-r3.2.js"></script>
    <script type="text/javascript" src="cars.js"></script>
    <style type="text/css">
```

```
#fig {
  width: 880px;
  height: 460px;
}

#title {
  position: absolute;
  top: 70px;
  left: 200px;
  padding: 10px;
  background: white;
}

large {
  font-size: medium;
}

    </style>
  </head>
  <body><div id="center"><div id="fig">
    <script type="text/javascript+protovis">

// The units and dimensions to visualize, in order.
var units = {
  cyl: {name: "cylinders", unit: ""},
  dsp: {name: "displacement", unit: " sq in"},
  lbs: {name: "weight", unit: " lbs"},
  hp: {name: "horsepower", unit: " hp"},
  acc: {name: "acceleration (0-60 mph)", unit: " sec"},
  mpg: {name: "mileage", unit: " mpg"},
  year: {name: "year", unit: ""}
}

var dims = pv.keys(units);

/* Sizing and scales. */
var w = 820,
    h = 420,
    fudge = 0.5,
    x = pv.Scale.ordinal(dims).splitFlush(0, w),
    y = pv.dict(dims, function(t) pv.Scale.linear(
        cars.filter(function(d) !isNaN(d[t])),
        function(d) Math.floor(d[t])-fudge,
        function(d) Math.ceil(d[t]) +fudge
        ).range(0, h)),
    c = pv.dict(dims, function(t) pv.Scale.linear(
        cars.filter(function(d) !isNaN(d[t])),
        function(d) Math.floor(d[t])-fudge,
        function(d) Math.ceil(d[t]) +fudge
        ).range("steelblue", "brown"));

/* Interaction state. */
var filter = pv.dict(dims, function(t) {
    return {min: y[t].domain()[0], max: y[t].domain()[1]};
  }), active = "mpg";

/* The root panel. */
var vis = new pv.Panel()
    .width(w)
    .height(h)
```

```
    .left(30)
    .right(30)
    .top(30)
    .bottom(20);

// The parallel coordinates display.
vis.add(pv.Panel)
    .data(cars)
    .visible(function(d) dims.every(function(t)
        (d[t] >= filter[t].min) && (d[t] <= filter[t].max)))
  .add(pv.Line)
    .data(dims)
    .left(function(t, d) x(t))
    .bottom(function(t, d) y[t](d[t]))
    .strokeStyle("#ddd")
    .lineWidth(1)
    .antialias(false);

// Rule per dimension.
rule = vis.add(pv.Rule)
    .data(dims)
    .left(x);

// Dimension label
rule.anchor("top").add(pv.Label)
    .top(-12)
    .font("bold 10px sans-serif")
    .text(function(d) units[d].name);

// The parallel coordinates display.
var change = vis.add(pv.Panel);

var line = change.add(pv.Panel)
    .data(cars)
    .visible(function(d) dims.every(function(t)
        (d[t] >= filter[t].min) && (d[t] <= filter[t].max)))
  .add(pv.Line)
    .data(dims)
    .left(function(t, d) x(t))
    .bottom(function(t, d) y[t](d[t]))
    .strokeStyle(function(t, d) c[active](d[active]))
    .lineWidth(1);

// Updater for slider and resizer.
function update(d) {
  var t = d.dim;
  filter[t].min = Math.max(y[t].domain()[0], y[t].invert(h - d.y - d.dy));
  filter[t].max = Math.min(y[t].domain()[1], y[t].invert(h - d.y));
  active = t;
  change.render();
  return false;
}

// Updater for slider and resizer.
function selectAll(d) {
  if (d.dy < 3) {
    var t = d.dim;
    filter[t].min = Math.max(y[t].domain()[0], y[t].invert(0));
    filter[t].max = Math.min(y[t].domain()[1], y[t].invert(h));
    d.y = 0; d.dy = h;
```

```
    active = t;
    change.render();
  }
  return false;
}

/* Handle select and drag */
var handle = change.add(pv.Panel)
    .data(dims.map(function(dim) { return {y:0, dy:h, dim:dim}; }))
    .left(function(t) x(t.dim) - 30)
    .width(60)
    .fillStyle("rgba(0,0,0,.001)")
    .cursor("crosshair")
    .event("mousedown", pv.Behavior.select())
    .event("select", update)
    .event("selectend", selectAll)
  .add(pv.Bar)
    .left(25)
    .top(function(d) d.y)
    .width(10)
    .height(function(d) d.dy)
    .fillStyle(function(t) t.dim == active
        ? c[t.dim]((filter[t.dim].max + filter[t.dim].min) / 2)
        : "hsla(0,0,50%,.5)")
    .strokeStyle("white")
    .cursor("move")
    .event("mousedown", pv.Behavior.drag())
    .event("dragstart", update)
    .event("drag", update);

handle.anchor("bottom").add(pv.Label)
    .textBaseline("top")
    .text(function(d) filter[d.dim].min.toFixed(0) + units[d.dim].unit);

handle.anchor("top").add(pv.Label)
    .textBaseline("bottom")
    .text(function(d) filter[d.dim].max.toFixed(0) + units[d.dim].unit);

vis.render();

    </script>
  </div></div></body>
</html>
```

Parallel Coordinates