Link:

https://vega.github.io/editor/#/url/vega/N4KABGBEAkDODGALApgWwIaQFxUQFzwAdYsB6UgN
2QHN0A6agSz0QFcAjOxge1IRQyUa6SgFY6AK1jcAdpAA04KABNkCAE6NCeHnJyQAgmAToCydWEIAbbnjD
cAZmAeMrqY3lONYO+LHlgAO7MiGAyrFZWYBToVqxq0d6ssYwAXsjKYLGy1GAsyFkAHmp0CkqQwcos2GAA
LKIADIoQkCiM1Pg19U3lhOjKyowy1DWizVDorHjcsGnINcCQeACehPP6LngKUOpqczV46vEAvorls9Qys
bA1ANpKEMBQV6jrUMsAYozIVsrbkDE4m9IABJACyABEAEJgABKXmGZQgyKg7CGfxwiyGhCmNUgsB+yHgW
wCkG42l0Nxwt1BkJh8J0iNJsNseGQMjAABVuBhpgkGUMRqSAKoAZTAAHF1DMbqSAOrcdS-
SoFKUyyAAXWOYFODzAT0gL2BhS+Pz+pMB8TxLLMHO5vO4-
IRQr1LTRMgx+sg2Nx+gJViJJKg5J0sipYBp4OhcOd-
xtbLtPNMjtgMcZQqgYsl0tgsqgCqVyhV2fVWp140ez3Qrzx8G4NnU-
0twKlyHZSJRqPRC29MhxW306n6PH+Icpd3xbJ+7CB-
125qg1F27bLpwgeoNRrx4Uiov2FtiVpwAA5yxuqzX9DurBL0IR-
qxCMpTMDr3v0mAANRgACMDUgOpKBqZwtM+nh3BuroXsCqDcBQ3yylBkCsEqeJgSIsHwSUUiyB2KJLEOMi
wA4iqoBBBnbIqAFH4Ssax4iR6ioBEmAVtRkDIIUhCNvoYGsKgdCcswAZfmAADkYAABTid+EnLMg6DqBJvG
oLcomwoS6AEmAEIvqJGoAJRgAAPkZYkAPyiYZ36WaJeFsZpNQtNM9Y6PeUEQMcUEanquoolRnaGtWwKAo
w5pIdIKHwDBcEIXZTmEcRpHkdR-
nUVAtHAi4Vhso2rEUexnHcSoph8bcJrfL8GpgAAhAAvGEERRAAZE1YDKbcnwVcoVV1Q1kSQO5gEUd5KK+
ZRSFblejUABoAJpxVAEXqFFeKYbFeXpQlDFkdSg2pWxGX0a4OULfhHFcWhJUqeVZpVbV9XXmALVtVdHWm
pVYD3X1VgDWlY0UQah36Og1BLsIbIAZ5w0+ax+0tJNzyNfNG34twkXRVhiH5Yc6BEdtyUA4NTmrJlx3mK
dyIFRdPGvTdH29Y9z3tZ1t2fQ9jW-dRUOdiNyL-
fqE1BduM0Laj6OrTFaiizjeNJbtaVwwFQNQFlJ0bWdhWXXgpV091bPfU9rXM+9esMxzg3cyivMeUBIGLf
AsRS-L435QjkDLCYAbSyTeJWEM8m5UhhHUG8tyLBcVw-
fobQdHYAC0323vea4NMBE2MCtOCHPEKPKEmQw9uheIhQukAuGaPYR7EeIs78kDHJbZ5+YLl5QIUnvzCjy
uQH7MgB6Lweh+H7SR8LkRJ-XATD5c1f6JU1THGnrsZ282fILn+d6F6Rf6CX-
zl3XmL4iPs9tyb9eN9zaflOgxThvczf5Yq3wyAOqKsjy-
wd3i7cO17pKOAcASN+YwVakVMHiLGSshJvGnqPfQut64w0gk-TQ7I3492QA4IM+I-
7Ag9ng0cDggHIBAaSbaEC-
TSxgZXE+Ud3jn0vrbEA5QMDqAANb3xQUrH2fplioHYPWUWDhpQ7W3qYTAu8Uh-
H5i0dkdZVALEGuxV+5NMRE0WvsI+zZRgNFkUrbgLktA9gPp6JYhjsrGMbqqNdWUBHxgVgRoyAhRK6EIQd-
chXVaEz3oc4xh+j8LLFcY7GuHiVZeKPlXXxtcZEBORE4rK9C4Gn0gHWBsk8EmuCsAAeT6PAZgQTtGHjeA
0Ogog4ktFSOiDiPYdE4D0RbWxrQ4JqIFmlFoiTanFKOrsdgmh4DsIye08JkRcnoHySsLps4cA-
gqVAKpHoalFOmb+axfMoKX1hkhbusB+GCJ+ijERn8j470RpEea+iVEKMcWlFRJ11HDOPukKZR4wCNDmeY
ox94j6mLxM5SxydGnKPsS+JRjyXGRLcW3MJZcIleiiT-
fxtiWiFPhXQvEMd8BgATm+OYpAABMQz2mwv6ss15kAADE6BqVEtuYksZEzUWLDqwAUp+K1keSaYgFpRVF
b4U6WS0mvT+mDI+fSvJBSXlvFmRbDZyDH48LonwgRQjDmiMLhIseVhpq0spvI7giiHlsXQa0vllNZjPMF
boj5-zXImLhZ8gFSC-
pNJBRDI1tyIVop8Vq98yACW6vyky3BIT9AEJCZ4iukT0VhqRZk0lXoWWUupZgMVWSGWSqtfUug7LkXzOq
V65l3T6kcqbmxblVBeXxqSQCYt4ThUZ1FXmklOSJWTKzas5tCzVCFtrSsmVf05U2O4TRXh6UOIkiQkMHK
4ydBUBqA4a468kJHLEYsU5hoZoXJRvqw1bS2JupucS3tCKpq7n3MGYhwCahx1qB84Np7cDIHaJ0ABV7SE
1B-AAZhtRO7x8Dira34nWVgr8RLiWvLZD5KRLhSrxJoWOgaArsE0j8f2cH9DTGTs2gVia62UoAJxEaQ-
y2QeA-UYbAAR0taymEQG8p5EAQA

Vega editor Code:

```
{
  "$schema": "https://vega.github.io/schema/vega/v5.json",
  "description": "A scatter plot of film statistics, with null values visualized
along the axes.",
  "width": 450,
  "height": 450,
  "padding": 5,
  "autosize": {"type": "fit", "resize": true},

  "signals": [
    { "name": "yField", "value": "IMDB Rating",
      "bind": {"input": "select", "options": ["IMDB Rating", "Rotten Tomatoes
Rating", "US Gross", "Worldwide Gross"]} },
    { "name": "xField", "value": "Rotten Tomatoes Rating",
      "bind": {"input": "select", "options": ["IMDB Rating", "Rotten Tomatoes
Rating", "US Gross", "Worldwide Gross"]} },
    { "name": "color", "value": "Green",
      "bind": {"input": "radio", "options": ["steelblue", "red", "green"]} },
    { "name": "nullSize", "value": 8 },
    { "name": "nullGap", "update": "nullSize + 10" }
  ],

  "data": [
    {
      "name": "movies",
      "url": "data/movies.json",
      "transform": [
        {
          "type": "formula",
          "expr": "datum.Title + ' (' + (year(datum['Release Date']) || '?') +
')'",
          "as":   "tooltip"
        }
      ]
    },
    {
      "name": "valid",
      "source": "movies",
      "transform": [
        {
          "type": "filter",
```

```
            "expr": "datum[xField] != null && datum[yField] != null"
          }
        ]
      },
      {
        "name": "nullXY",
        "source": "movies",
        "transform": [
          {
            "type": "filter",
            "expr": "datum[xField] == null && datum[yField] == null"
          },
          { "type": "aggregate" }
        ]
      },
      {
        "name": "nullY",
        "source": "movies",
        "transform": [
          {
            "type": "filter",
            "expr": "datum[xField] != null && datum[yField] == null"
          }
        ]
      },
      {
        "name": "nullX",
        "source": "movies",
        "transform": [
          {
            "type": "filter",
            "expr": "datum[xField] == null && datum[yField] != null"
          }
        ]
      }
    ],

    "scales": [
      {
        "name": "yscale",
        "type": "linear",
        "range": [{"signal": "height - nullGap"}, 0],
        "nice": true,
        "domain": {"data": "valid", "field": {"signal": "yField"}}
      },
```

```
      {
        "name": "xscale",
        "type": "linear",
        "range": [{"signal": "nullGap"}, {"signal": "width"}],
        "nice": true,
        "domain": {"data": "valid", "field": {"signal": "xField"}}
      }
    ],

    "axes": [
      {
        "orient": "bottom", "scale": "xscale", "offset": 5, "format": "s",
        "title": {"signal": "xField"}
      },
      {
        "orient": "left", "scale": "yscale", "offset": 5, "format": "s",
        "title": {"signal": "yField"}
      }
    ],

    "marks": [
      {
        "type": "symbol",
        "from": {"data": "valid"},
        "encode": {
          "enter": {
            "size": {"value": 50},
            "tooltip": {"field": "tooltip"}
          },
          "update": {
            "x": {"scale": "xscale", "field": {"signal": "xField"}},
            "y": {"scale": "yscale", "field": {"signal": "yField"}},

            "fill": {"signal": "color"},
            "fillOpacity": {"value": 0.5},
            "zindex": {"value": 0}
          },
          "hover": {
            "fill": {"value": "firebrick"},
            "fillOpacity": {"value": 1},
            "zindex": {"value": 1}
          }
        }
      },
      {
```

```
      "type": "symbol",
      "from": {"data": "nullY"},
      "encode": {
        "enter": {
          "size": {"value": 50},
          "tooltip": {"field": "tooltip"}
        },
        "update": {
          "x": {"scale": "xscale", "field": {"signal": "xField"}},
          "y": {"signal": "height - nullSize/2"},
          "fill": {"value": "#aaa"},
          "fillOpacity": {"value": 0.2}
        },
        "hover": {
          "fill": {"value": "firebrick"},
          "fillOpacity": {"value": 1}
        }
      }
    },
    {
      "type": "symbol",
      "from": {"data": "nullX"},
      "encode": {
        "enter": {
          "size": {"value": 50},
          "tooltip": {"field": "tooltip"}
        },
        "update": {
          "x": {"signal": "nullSize/2"},
          "y": {"scale": "yscale", "field": {"signal": "yField"}},
          "fill": {"value": "#aaa"},
          "fillOpacity": {"value": 0.2},
          "zindex": {"value": 0}
        },
        "hover": {
          "fill": {"value": "firebrick"},
          "fillOpacity": {"value": 1},
          "zindex": {"value": 1}
        }
      }
    },
    {
      "type": "text",
      "interactive": false,
      "from": {"data": "nullXY"},
```

```
  "encode": {
    "update": {
      "x": {"signal": "nullSize", "offset": -4},
      "y": {"signal": "height", "offset": 13},
      "text": {"signal": "datum.count + ' null'"},
      "align": {"value": "right"},
      "baseline": {"value": "top"},
      "fill": {"value": "#999"},
      "fontSize": {"value": 9}
    }
  }
]
}
```