

# Geoscript Groovy Cookbook

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# Geometry Recipes

## Creating Geometries

*Create a Point with an XY*

```
Point point = new Point(-123,46)
```

[ geometry create point ] | *geometry\_create\_point.png*

*Create a LineString from Coordinates*

```
LineString lineString = new LineString(  
    [3.1982421875, 43.1640625],  
    [6.7138671875, 49.755859375],  
    [9.7021484375, 42.5927734375],  
    [15.3271484375, 53.798828125]  
)
```

[ geometry create linestring coordinates ] | *geometry\_create\_linestring\_coordinates.png*

*Create a Polygon from a List of Coordinates*

```
Polygon polygon = new Polygon([[  
    [-101.35986328125, 47.754097979680026],  
    [-101.5576171875, 46.93526088057719],  
    [-100.12939453125, 46.51351558059737],  
    [-99.77783203125, 47.44294999517949],  
    [-100.45898437499999, 47.88688085106901],  
    [-101.35986328125, 47.754097979680026]  
]])
```

[ geometry create polygon ] | *geometry\_create\_polygon.png*

*Create a MultiPoint with a List of Points*

```
MultiPoint multiPoint = new MultiPoint([  
    new Point(-122.3876953125, 47.5820839916191),  
    new Point(-122.464599609375, 47.25686404408872),  
    new Point(-122.48382568359374, 47.431803338643334)  
)
```

[ geometry create multipoint ] | *geometry\_create\_multipoint.png*

### Create a MultiLineString with a List of LineStrings

```
MultiLineString multiLineString = new MultiLineString([
    new LineString (
        [-122.3822021484375, 47.57837853860192],
        [-122.32452392578125, 47.48380086737799]
    ),
    new LineString (
        [-122.32452392578125, 47.48380086737799],
        [-122.29705810546874, 47.303447043862626]
    ),
    new LineString (
        [-122.29705810546874, 47.303447043862626],
        [-122.42889404296875, 47.23262467463881]
    )
])
```

[ geometry create multilinestring ] | *geometry\_create\_multilinestring.png*

### Create a MultiPolygon with a List of Polygons

```
MultiPolygon multiPolygon = new MultiPolygon(
    new Polygon ([[
        [-122.2723388671875, 47.818687628247105],
        [-122.37945556640624, 47.66168780332917],
        [-121.95373535156249, 47.67093619422418],
        [-122.2723388671875, 47.818687628247105]
    ]]),
    new Polygon ([[
        [-122.76672363281249, 47.42437092240516],
        [-122.76672363281249, 47.59505101193038],
        [-122.52227783203125, 47.59505101193038],
        [-122.52227783203125, 47.42437092240516],
        [-122.76672363281249, 47.42437092240516]
    ]]),
    new Polygon ([[
        [-122.20367431640624, 47.543163654317304],
        [-122.3712158203125, 47.489368981370724],
        [-122.33276367187499, 47.35371061951363],
        [-122.11029052734374, 47.3704545156932],
        [-122.08831787109375, 47.286681888764214],
        [-122.28332519531249, 47.2270293988673],
        [-122.2174072265625, 47.154237057576594],
        [-121.904296875, 47.32579231609051],
        [-122.06085205078125, 47.47823216312885],
        [-122.20367431640624, 47.543163654317304]
    ]])
)
```

[ geometry create multipolygon ] | *geometry\_create\_multipolygon.png*

### Create a CircularString with a List of Points

```
CircularString circularString = new CircularString([
    [-122.464599609375, 47.247542522268006],
    [-122.03613281249999, 47.37789454155521],
    [-122.37670898437499, 47.58393661978134]
])
```

[ geometry create circularstring ] | *geometry\_create\_circularstring.png*

### Create a CircularRing with a List of Points

```
CircularRing circularRing = new CircularRing([
    [-118.47656249999999, 41.508577297439324],
    [-109.6875, 57.51582286553883],
    [-93.8671875, 42.032974332441405],
    [-62.57812500000001, 30.14512718337613],
    [-92.10937499999999, 7.36246686553575],
    [-127.265625, 14.604847155053898],
    [-118.47656249999999, 41.508577297439324]
])
```

[ geometry create circularring ] | *geometry\_create\_circularring.png*

### Create a CompoundCurve with a List of CircularStrings and LineStrings

```
CompoundCurve compoundCurve = new CompoundCurve([
    new CircularString([
        [27.0703125, 23.885837699862005],
        [5.9765625, 40.17887331434696],
        [22.5, 47.98992166741417],
    ]),
    new LineString([
        [22.5, 47.98992166741417],
        [71.71875, 49.15296965617039],
    ]),
    new CircularString([
        [71.71875, 49.15296965617039],
        [81.5625, 39.36827914916011],
        [69.9609375, 24.5271348225978]
    ])
])
```

[ geometry create compoundcurve ] | *geometry\_create\_compoundcurve.png*

Create a *CompoundRing* with a connected List of *CircularStrings* and *LineStrings*

```
CompoundRing compoundRing = new CompoundRing([
    new CircularString([
        [27.0703125, 23.885837699862005],
        [5.9765625, 40.17887331434696],
        [22.5, 47.98992166741417],
    ]),
    new LineString([
        [22.5, 47.98992166741417],
        [71.71875, 49.15296965617039],
    ]),
    new CircularString([
        [71.71875, 49.15296965617039],
        [81.5625, 39.36827914916011],
        [69.9609375, 24.5271348225978],
    ]),
    new LineString([
        [69.9609375, 24.5271348225978],
        [27.0703125, 23.885837699862005],
    ])
])
```

[ geometry create compoundring ] | *geometry\_create\_compoundring.png*

Create a *Bounds* from four coordinates (*minx*, *miny*, *maxx*, *maxy*) and a projection.

```
Bounds bounds = new Bounds(-127.265, 43.068, -113.554, 50.289, "EPSG:4326")
drawGeometries("geometry_create_bounds", [bounds.geometry])
```

[ geometry create bounds ] | *geometry\_create\_bounds.png*

## Processing Geometries

*Buffer a Point*

```
Point point = new Point(-123,46)
Geometry bufferedPoint = point.buffer(2)
```

[ geometry buffer point ] | *geometry\_buffer\_point.png*

*Get Bounds from a Geometry*

```
Point point = new Point(-123,46)
Polygon polygon = point.buffer(2)
Bounds bounds = polygon.bounds
```

# Projection Recipes

## Creating Projections

*Create a Projection from an EPSG Code*

```
Projection proj = new Projection("EPSG:4326")
println proj.wkt
```

Unresolved directive in projection.asciidoc -  
include::output/projection\_createprojectionfromepsg.txt[]

*Create a Projection from a WKT Projection String*

```
Projection proj = new Projection("""GEOGCS["WGS 84",
DATUM["World Geodetic System 1984",
SPHEROID["WGS 84", 6378137.0, 298.257223563, AUTHORITY["EPSG","7030"]],
AUTHORITY["EPSG","6326"]],
PRIMEM["Greenwich", 0.0, AUTHORITY["EPSG","8901"]],
UNIT["degree", 0.017453292519943295],
AXIS["Geodetic longitude", EAST],
AXIS["Geodetic latitude", NORTH],
AUTHORITY["EPSG","4326"]]""")
```

Unresolved directive in projection.asciidoc -  
include::output/projection\_createprojectionfromwkt.txt[]

*Create a Projection from well known name*

```
Projection proj = new Projection("Mollweide")
println proj.wkt
```

Unresolved directive in projection.asciidoc -  
include::output/projection\_createprojectionfromname.txt[]

## Plot Recipes

# Creating a Bar Chart

*Create a basic bar chart*

```
List data = [  
    [1,10],[45,12],[23,3],[5,20]  
]  
Chart chart = Bar.xy(data)
```

[ plot bar chart ] | *plot\_bar\_chart.png*

*Create a bar chart with categories*

```
Map data = [  
    "A":20,"B":45,"C":2,"D":14  
]  
Chart chart = Bar.category(data)
```

[ plot bar chart with categories ] | *plot\_bar\_chart\_with\_categories.png*