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# Projection Recipes

## Creating Projections

*Create a Projection from an EPSG Code*

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

```
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"]]
```

*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"]]" """)
```

```
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"]]
```

*Create a Projection from well known name*

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

```
PROJCS["Mollweide",  
  GEOGCS["WGS84",  
    DATUM["WGS84",  
      SPHEROID["WGS84", 6378137.0, 298.257223563]],  
    PRIMEM["Greenwich", 0.0],  
    UNIT["degree", 0.017453292519943295],  
    AXIS["Longitude", EAST],  
    AXIS["Latitude", NORTH]],  
  PROJECTION["Mollweide"],  
  PARAMETER["semi-minor axis", 6378137.0],  
  PARAMETER["Longitude of natural origin", 0.0],  
  UNIT["m", 1.0],  
  AXIS["Easting", EAST],  
  AXIS["Northing", NORTH]]
```

## Using Projections

*Transform a Geometry from one projection to another*

```
Geometry epsg4326Geom = new Point(-122.440, 47.245)  
Geometry epsg2927Geom = Projection.transform(epsg4326Geom, "EPSG:4326", "EPSG:2927")  
println epsg2927Geom
```

```
POINT (1158609.2040371667 703068.0661327887)
```