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Tile Recipes

The Tile classes are in the **geoscript.layer** package.

Tile

Tile Properties

Get a Tile's Properties.

```
byte[] data = new File("src/main/resources/tile.png").bytes
Tile tile = new Tile(2,1,3,data)
println "Z = ${tile.z}"
println "X = ${tile.x}"
println "Y = ${tile.y}"
println "Tile = ${tile.toString()}"
println "# bytes = ${tile.data.length}"
println "Data as base64 encoded string = ${tile.base64String}"
```

```
Z = 2
X = 1
Y = 3
Tile = Tile(x:1, y:3, z:2)
# bytes = 11738
Data as base64 encoded string = iVBORw0KGgoAAAANSUhEUgAAAQAAAAEACAYAAABccqhmAAAtoU...
```

ImageTile Properties

Some Tiles contain an Image. ImageTile's have an image property.

```
byte[] data = new File("src/main/resources/tile.png").bytes
ImageTile tile = new ImageTile(0,0,0,data)
BufferedImage image = tile.image
```

Grid

A Grid describes a level in a Pyramid of Tiles.

Grid Properties

```
Grid grid = new Grid(1, 2, 2, 78206.0, 78206.0)
println "Zoom Level: ${grid.z}"
println "Width / # Columns: ${grid.width}"
println "Height / # Rows: ${grid.height}"
println "Size / # Tiles: ${grid.size}"
println "X Resolution: ${grid.xResolution}"
println "Y Resolution: ${grid.yResolution}"
```

```
Zoom Level: 1
Width / # Columns: 2
Height / # Rows: 2
Size / # Tiles: 4
X Resolution: 78206.0
Y Resolution: 78206.0
```

Pyramid

Pyramid Properties

Get the Pyramid's Bounds.

```
Pyramid pyramid = Pyramid.createGlobalMercatorPyramid()

Bounds bounds = pyramid.bounds
println bounds
```

```
(-2.0036395147881314E7,-
2.003747120513706E7,2.0036395147881314E7,2.003747120513706E7,EPSG:3857)
```

Get the Pyramid's projection.

```
Projection proj = pyramid.proj
println proj
```

```
EPSG:3857
```

Get the Pyramid's Origin.

```
Pyramid.Origin origin = pyramid.origin
println origin
```

```
BOTTOM_LEFT
```

Get the Pyramid's Tile Width and Height.

```
int tileWidth = pyramid.tileWidth
int tileHeight = pyramid.tileHeight
println "${tileWidth} x ${tileHeight}"
```

```
256 x 256
```

Create Pyramids

Create a Global Mercator Pyramid.

```
Pyramid pyramid = Pyramid.createGlobalMercatorPyramid()
println "Projection: ${pyramid.proj}"
println "Origin: ${pyramid.origin}"
println "Bounds: ${pyramid.bounds}"
println "Max Zoom: ${pyramid.maxGrid.z}"
```

```
Projection: EPSG:3857
Origin: BOTTOM_LEFT
Bounds: (-2.0036395147881314E7,-
2.0037471205137067E7,2.0036395147881314E7,2.003747120513706E7,EPSG:3857)
Max Zoom: 19
```

Create a Global Geodetic Pyramid.

```
Pyramid pyramid = Pyramid.createGlobalGeodeticPyramid()
println "Projection: ${pyramid.proj}"
println "Origin: ${pyramid.origin}"
println "Bounds: ${pyramid.bounds}"
println "Max Zoom: ${pyramid.maxGrid.z}"
```

```
Projection: EPSG:4326
Origin: BOTTOM_LEFT
Bounds: (-179.99,-89.99,179.99,89.99,EPSG:4326)
Max Zoom: 19
```

Create a Global Mercator Pyramid from a well known name.

Well known names include:

- GlobalMercator
- Mercator
- GlobalMercatorBottomLeft
- GlobalMercatorTopLeft
- GlobalGeodetic
- Geodetic

```
Pyramid pyramid = Pyramid.fromString("mercator")
println "Projection: ${pyramid.proj}"
println "Origin: ${pyramid.origin}"
println "Bounds: ${pyramid.bounds}"
println "Max Zoom: ${pyramid.maxGrid.z}"
```

```
Projection: EPSG:3857
Origin: BOTTOM_LEFT
Bounds: (-2.0036395147881314E7,-
2.0037471205137067E7,2.0036395147881314E7,2.003747120513706E7,EPSG:3857)
Max Zoom: 19
```

Get a Grid from a Pyramid

Get a the min Grid.

```
Pyramid pyramid = Pyramid.createGlobalMercatorPyramid()
Grid grid = pyramid.minGrid
println "Zoom Level: ${grid.z}"
println "Width / # Columns: ${grid.width}"
println "Height / # Rows: ${grid.height}"
println "Size / # Tiles: ${grid.size}"
println "X Resolution: ${grid.xResolution}"
println "Y Resolution: ${grid.yResolution}"
```

```
Zoom Level: 0
Width / # Columns: 1
Height / # Rows: 1
Size / # Tiles: 1
X Resolution: 156412.0
Y Resolution: 156412.0
```

Get a the max Grid.

```
Pyramid pyramid = Pyramid.createGlobalMercatorPyramid()
Grid grid = pyramid.maxGrid
println "Zoom Level: ${grid.z}"
println "Width / # Columns: ${grid.width}"
println "Height / # Rows: ${grid.height}"
println "Size / # Tiles: ${grid.size}"
println "X Resolution: ${grid.xResolution}"
println "Y Resolution: ${grid.yResolution}"
```

```
Zoom Level: 19
Width / # Columns: 524288
Height / # Rows: 524288
Size / # Tiles: 274877906944
X Resolution: 0.29833221435546875
Y Resolution: 0.29833221435546875
```

Get a Grid from a Pyramid by Zoom Level.

```
Pyramid pyramid = Pyramid.createGlobalMercatorPyramid()
Grid grid = pyramid.grid(1)
println "Zoom Level: ${grid.z}"
println "Width / # Columns: ${grid.width}"
println "Height / # Rows: ${grid.height}"
println "Size / # Tiles: ${grid.size}"
println "X Resolution: ${grid.xResolution}"
println "Y Resolution: ${grid.yResolution}"
```

```
Zoom Level: 1
Width / # Columns: 2
Height / # Rows: 2
Size / # Tiles: 4
X Resolution: 78206.0
Y Resolution: 78206.0
```

Tile Layer

Tile Layer Properties

Create a TileLayer from an MBTiles File.

```
File file = new File("src/main/resources/tiles.mbtiles")
MBTiles mbtiles = new MBTiles(file)
```

Get the TileLayer's name.

```
String name = mbtiles.name
println name
```

```
countries
```

Get the TileLayer's Bounds.

```
Bounds bounds = mbtiles.bounds
println bounds
```

```
(-2.0036395147881314E7,-
2.003747120513706E7,2.0036395147881314E7,2.003747120513706E7,EPSG:3857)
```

Get the TileLayer's Projection.

```
Projection proj = mbtiles.proj
println proj
```

```
EPSG:3857
```

Get the TileLayer's Pyramid.

```
Pyramid pyramid = mbtiles.pyramid
println pyramid
```

```
geoscript.layer.Pyramid(proj:EPSG:3857, bounds:(-2.0036395147881314E7,-
2.0037471205137067E7,2.0036395147881314E7,2.003747120513706E7,EPSG:3857),
origin:BOTTOM_LEFT, tileWidth:256, tileHeight:256)
```

Get a Tile from a TileLayer.

```
Tile tile = mbtiles.get(0, 0, 0)
println tile
```

```
Tile(x:0, y:0, z:0)
```

TileCursor

A TileCursor is a way to get a collection of Tiles from a TileLayer.

Get a TileCursor with all of the Tiles form a TileLayer in a zoom level.

```
File file = new File("src/main/resources/tiles.mbtiles")
MBTiles mbtiles = new MBTiles(file)
TileCursor tileCursor = new TileCursor(mbtiles, 1)

println "Zoom Level: ${tileCursor.z}"
println "# of tiles: ${tileCursor.size}"
println "Bounds: ${tileCursor.bounds}"
println "Width / # Columns: ${tileCursor.width}"
println "Height / # Rows: ${tileCursor.height}"
println "MinX: ${tileCursor.minX}, MinY: ${tileCursor.minY}, MaxX: ${tileCursor.maxX},
MaxY: ${tileCursor.maxY}"

println "Tiles:"
tileCursor.each { Tile t ->
    println t
}
```

```
Zoom Level: 1
# of tiles: 4
Bounds: (-2.0036395147881314E7,-
2.0037471205137067E7,2.0036395147881314E7,2.003747120513706E7,EPSG:3857)
Width / # Columns: 2
Height / # Rows: 2
MinX: 0, MinY: 0, MaxX: 1, MaxY: 1

Tiles:
Tile(x:0, y:0, z:1)
Tile(x:1, y:0, z:1)
Tile(x:0, y:1, z:1)
Tile(x:1, y:1, z:1)
```