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## Process Recipes

The Process classes are in the [geoscript.process](#) package.

### Execute a built-in Process

*Create a Process from a built-in process by name*

```
Process process = new Process("vec:Bounds")
String name = process.name
println name
```

```
vec:Bounds
```

*Get the title*

```
String title = process.title
println title
```

```
Bounds
```

*Get the description*

```
String description = process.description
println description
```

```
Computes the bounding box of the input features.
```

*Get the version*

```
String version = process.version
println version
```

1.0.0

*Get the input parameters*

```
Map parameters = process.parameters  
println parameters
```

```
[features:class geoscript.layer.Cursor]
```

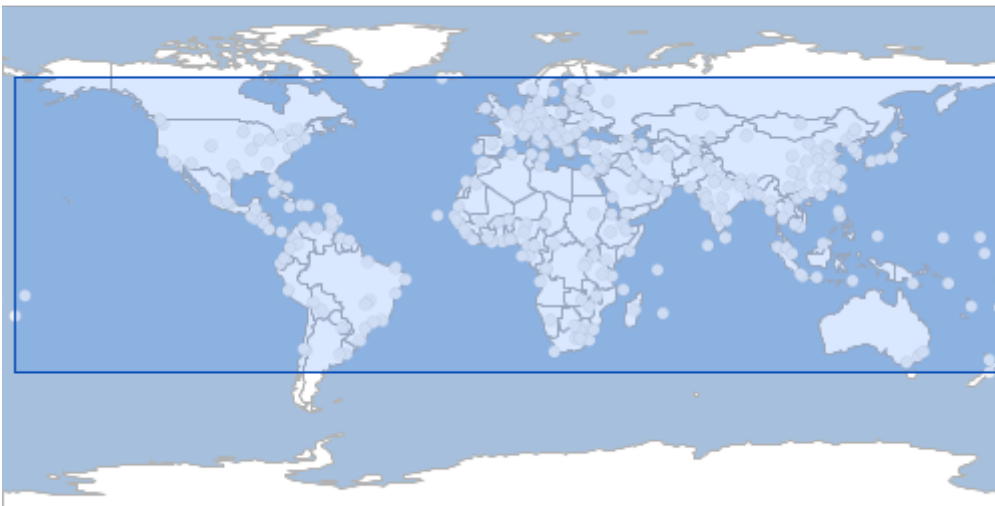
*Get the output parameters*

```
Map results = process.results  
println results
```

```
[bounds:class geoscript.geom.Bounds]
```

*Execute the Process to calculate the bounding box of all Features in a Layer*

```
Workspace workspace = new GeoPackage('src/main/resources/data.gpkg')  
Layer layer = workspace.get("places")  
Map executeResults = process.execute([features: layer])  
Bounds bounds = executeResults.bounds
```



## Listing built-in Processes

```
List<String> processes = Process.processNames
processes.each { String name ->
  println name
}
```

```
vec:Aggregate
vec:BarnesSurface
vec:Bounds
vec:BufferFeatureCollection
vec:Centroid
vec:ClassifyByRange
vec:Clip
vec:CollectGeometries
vec:Count
vec:Feature
vec:FeatureClassStats
vec:Grid
vec:GroupCandidateSelection
vec:Heatmap
vec:InclusionFeatureCollection
vec:IntersectionFeatureCollection
vec:LRSGeocode
vec:LRSMeasure
vec:LRSegment
vec:Nearest
vec:PointBuffers
vec:PointStacker
vec:Query
vec:RectangularClip
vec:Reproject
vec:Simplify
vec:Snap
vec:Transform
vec:UnionFeatureCollection
vec:Unique
vec:VectorToRaster
vec:VectorZonalStatistics
geo:buffer
geo:union
geo:intersection
geo:isValid
geo:getX
geo:getY
geo:difference
geo:reproject
geo:isClosed
geo:splitPolygon
geo:within
```

geo:touches  
geo:convexHull  
geo:area  
geo:crosses  
geo:symDifference  
geo:distance  
geo:boundary  
geo:centroid  
geo:interiorPoint  
geo:getGeometryN  
geo:overlaps  
geo:isSimple  
geo:isWithinDistance  
geo:relate  
geo:densify  
geo:simplify  
geo:numGeometries  
geo:startPoint  
geo:numPoints  
geo:dimension  
geo:exteriorRing  
geo:numInteriorRing  
geo:geometryType  
geo:envelope  
geo:endPoint  
geo:polygonize  
geo:isRing  
geo>equalsExact  
geo:relatePattern  
geo:interiorRingN  
geo>equalsExactTolerance  
geo:pointN  
geo:length  
geo:isEmpty  
geo:contains  
geo:disjoint  
geo:intersects  
polygonlabelprocess:PolyLabeller  
centerLine:centerLine  
skeltonize:centerLine  
ras:AddCoverages  
ras:Affine  
ras:AreaGrid  
ras:BandMerge  
ras:BandSelect  
ras:Contour  
ras:ConvolveCoverage  
ras:CovarianceClassStats  
ras:CropCoverage  
ras:Jiffle  
ras:MultiplyCoverages

```
ras:NormalizeCoverage
ras:PolygonExtraction
ras:RangeLookup
ras:RasterAsPointCollection
ras:RasterZonalStatistics
ras:RasterZonalStatistics2
ras:ScaleCoverage
ras:StyleCoverage
ras:TransparencyFill
geoscript:convexhull
```

## Executing a new Process

*Create a Process using a Groovy Closure*

```
Process process = new Process("convexhull",
    "Create a convexhull around the features",
    [features: geoscript.layer.Cursor],
    [result: geoscript.layer.Cursor],
    { inputs ->
        def geoms = new GeometryCollection(inputs.features.collect{f -> f.geom})
        def output = new Layer()
        output.add([geoms.convexHull])
        [result: output]
    }
)
String name = process.name
println name
```

```
geoscript:convexhull
```

*Get the title*

```
String title = process.title
println title
```

```
convexhull
```

*Get the description*

```
String description = process.description
println description
```

```
Create a convexhull around the features
```

### *Get the version*

```
String version = process.version  
println version
```

```
1.0.0
```

### *Get the input parameters*

```
Map parameters = process.parameters  
println parameters
```

```
[features:class geoscript.layer.Cursor]
```

### *Get the output parameters*

```
Map results = process.results  
println results
```

```
[result:class geoscript.layer.Cursor]
```

### *Execute the Process created from a Groovy Closure*

```
Workspace workspace = new GeoPackage('src/main/resources/data.gpkg')  
Layer layer = workspace.get("places")  
Map executeResults = process.execute([features: layer.cursor])  
Cursor convexHullCursor = executeResults.result
```



# Process Functions

Process Functions are a combination of Functions and Processes that can be used to create rendering transformations.

*Create a Function from a Process that converts geometries in a Layer into a convexhull.*

```
Workspace workspace = new GeoPackage('src/main/resources/data.gpkg')
Layer places = workspace.get("places")
Process process = new Process("convexhull",
    "Create a convexhull around the features",
    [features: geoscript.layer.Cursor],
    [result: geoscript.layer.Cursor],
    { inputs ->
        def geoms = new GeometryCollection(inputs.features.collect{ f -> f.geom})
        def output = new Layer()
        output.add([geoms.convexHull])
        [result: output]
    }
)
Function function = new Function(process, new Function("parameter", new Expression(
    "features")))
Symbolizer symbolizer = new Transform(function, Transform.RENDERING) + new Fill(
    "aqua", 0.75) + new Stroke("navy", 0.5)
places.style = symbolizer
```



Create a ProcessFunction from a Process that converts geometries in a Layer into a bounds.

```
Workspace workspace = new GeoPackage('src/main/resources/data.gpkg')
Layer places = workspace.get("places")
Process process = new Process("bounds",
    "Create a bounds around the features",
    [features: geoscript.layer.Cursor],
    [result: geoscript.layer.Cursor],
    { inputs ->
        def geoms = new GeometryCollection(inputs.features.collect{ f -> f.geom})
        def output = new Layer()
        output.add([geoms.bounds.geometry])
        [result: output]
    }
)
ProcessFunction processFunction = new ProcessFunction(process, new Function
("parameter", new Expression("features")))
Symbolizer symbolizer = new Transform(processFunction, Transform.RENDERING) + new
Fill("aqua", 0.75) + new Stroke("navy", 0.5)
places.style = symbolizer
```

