Esri's ArcPy

```
# Get China less gas flares polygon
arcpy.Select_analysis("countries_nogas", "china1.shp",
   "\"NAME\" = 'China'")
# Average two satellites for 1994
outRaster = (Float("F101994")+Float("F121994"))/2
outRaster.save("FXX1994")

# Use buffer tool and roads to make polygon of China
# close to roads, then clip china1 to this
arcpy.Buffer_analysis("a2010_final_proj",
   "roadbuff.shp", "0.5 DecimalDegrees", "FULL",
   "ROUND", "ALL", "")
arcpy.Clip_analysis("H:/Research/Data/Lights/
   china1.shp", "H:/Research/Data/Lights/roadbuff.shp",
   "china2.shp", "")

# Clip each lights raster to extent of china2
rasterList = arcpy.ListRasters("F*")
for raster in rasterList:
   arcpy.Clip_management(raster, "-179.9999 -90.0 180.0
     83.62741", "G"+str(raster[1:]), "H:/Research/Data/
     Lights/china2.shp", "", "ClippingGeometry")

# Create grid to extent of one of new light rasters
arcpy.CreateFishnet_management("ch_grid.shp", "73.55416
   18.15416", "73.5541 28.15416","0.1", "0.1", "0",
   "0", "134.77916 53.5625", "NO_LABELS", "G101992",
   "POLYGON")
arcpy.RasterToPolygon_conversion("G101992",
   "G101992p.shp", "NO_SIMPLIFY", "Value")

# Process: Clip grid to perimeter of polygon
arcpy.Clip_analysis("H:/Research/Data/Lights/
   ch_grid.shp", "H:/Research/Data/Lights/
   G101992p.shp", "china_grid.shp", "")

# Zonal statistics on each year
rasterList = arcpy.ListRasters("G*")
for raster in rasterList:
   arcpy.gp.ZonalStatisticsAsTable_sa("H:/Research/
      Data/Lights/china_grid.shp", "FID", raster,
      "l"+str(raster[5:])+".dbf", "DATA", "MEAN")
```

Lenses

```
# load input data
china = new object("China.shp")
gas_flares = new object_set("Flares_China_1.shp")
roads = new object_set("a2010_final_proj.shp")
lights_101994 = new field("F101994", china, inside)
lights_121994 = new field("F121994", china, inside)

# What is the luminosity in year 1994 in China,
# excluding gas flares?
luminosity_1994 =
    local(lights_101994, lights_121994, average)
luminosity_excluding_flares =
    set_domain(luminosity_1994, gas_flares, outside)

# What is the luminosity within 0.5 degrees from roads?
roads_buffered = buffer(roads, 0.5)
luminosity_around_roads =
    set_domain(luminosity_1994, roads_buffered, inside)

# What is the mean luminosity in a 0.1 by 0.1 degree area?
final_result = coarsen(luminosity_around_roads, 0.1, 0.1)
```