Generation of Multi-level Directed Graphs Geometry

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library(knitr)
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knitr::opts_chunk$set(cache=TRUE)
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```
import sys
import os
mldgpath = "C:/Users/petelin/Documents/MLDG"
sys.path.insert(0, mldgpath)
import mldg

model = 'mfs'
modelpath = mldgpath + "/models/" + model
meshfile = modelpath + "/" + "meshmask.nc"
configfile = modelpath + "/" + model + '.cfg'
maskfile = modelpath + '/' + model + '_mask.shp'
mask = mldg.load_mask(maskfile)

prospath = mldgpath + "/" + "projects"
nx = 60
ny = 30
project = model + "_" + "%2dx%2d" % (nx,ny)
projpath = prospath + '/' + project
try:
    os.stat(projpath)
except:
    os.mkdir(projpath)
    os.mkdir(projpath + '/geometry')
    os.mkdir(projpath + '/trajectories')
    os.mkdir(projpath + '/examples')
    os.mkdir(projpath + '/rules')
    os.mkdir(projpath + '/graphs')
    os.mkdir(projpath + '/other')
    os.mkdir(projpath + '/figures')

geompath = projpath + '/geometry'
include_region = [2]
vertfile = geompath + '/' + model + '_vertices_' + "%dx%d" % (nx,ny) + '.shp'
(verts,name,long_name,lon_wmc,lat_wmc) = mldg.generate_vertices(nx,ny,mask,include_region,configfile)
mldg.save_vertices(verts,name,long_name,lon_wmc,lat_wmc,vertfile)

mapfile = geompath + '/' + model + '_' + "%dx%d" % (nx,ny) + '_model_cells_vertices.txt'
mldg.map_model_cells_to_vertices(meshfile,verts,name,mapfile)

figpath = projpath + '/figures'
figfile = figpath + '/' + model + '_vertices_' + "%dx%d" % (nx,ny) + '.pdf'
mldg.show_vertices(verts,name,long_name,lon_wmc,lat_wmc,configfile,figfile)
figfile = figpath + '/' + model + '_vertices_mask_' + "%dx%d" % (nx,ny) + '.pdf'
mldg.show_vertices_mask(verts,name,lon_wmc,lat_wmc,mask,configfile,figfile)
```

```
# print summary
print 'Summary:'
print
print 'Project:'
print project
print 'Project path:'
print projpath
print
print 'Model:'
print model
print 'Model path:'
print modelpath
print 'Model meshmask file:'
print meshfile
print 'Model configuration file:'
print configfile
print 'Model mask file:'
print maskfile
print
print 'Multi-level directed graph vertices file:'
print vertfile
print 'Model cells to vertices mapfile:'
print mapfile
```

```
## Summary:
##
## Project:
## mfs_60x30
## Project path:
## C:/Users/petelin/Documents/MLDG/projects/mfs_60x30
##
## Model:
## mfs
## Model path:
## C:/Users/petelin/Documents/MLDG/models/mfs
## Model meshmask file:
## C:/Users/petelin/Documents/MLDG/models/mfs/meshmask.nc
## Model configuration file:
## C:/Users/petelin/Documents/MLDG/models/mfs/mfs.cfg
## Model mask file:
## C:/Users/petelin/Documents/MLDG/models/mfs/mfs_mask.shp
##
## Multi-level directed graph vertices file:
## C:/Users/petelin/Documents/MLDG/projects/mfs_60x30/geometry/mfs_vertices_60x30.shp
## Model cells to vertices mapfile:
## C:/Users/petelin/Documents/MLDG/projects/mfs_60x30/geometry/mfs_60x30_model_cells_vertices.txt
```