```python
nbodyplots.py
#!/usr/bin/python3

import os, shutil, glob
import numpy as np
import plawt, imageio
from parsenbody import parseNBodyData

def threebodyplots():
    simdir = 'simulations'
    figdir = 'figures'
    for folder in [simdir, figdir]:
        if not os.path.exists(folder):
            os.mkdir(folder)

    for filename in glob.glob(os.path.join(simdir, '*.in')):
        title = os.path.splitext(os.path.basename(filename))[0]
        simulation = parseNBodyData(os.path.join(simdir, title + '.out'))
        numPlanets = simulation['n']
        time = simulation['time']
        planets = simulation['planets'] # # The indexing is: planets[planetid, posOrVel, time, component]

        tend = -1 # -1 takes the whole slice
        tstep = 20
        plawt.plot({
            'title': title,
            # Paths
            0: {'x': planets[0,0,:tend,0], 'y': planets[0,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'k-'},
            1: {'x': planets[1,0,:tend,0], 'y': planets[1,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'b-'},
            2: {'x': planets[2,0,:tend,0], 'y': planets[2,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'r-'},
            # Starting Positions
            3: {'x': planets[0,0,0,0], 'y': planets[0,0,0,1], 'line': 'ko', 'ms': 10},
            4: {'x': planets[1,0,0,0], 'y': planets[1,0,0,1], 'line': 'bo', 'ms': 10},
            5: {'x': planets[2,0,0,0], 'y': planets[2,0,0,1], 'line': 'ro', 'ms': 10},
            # Final Positions
            6: {'x': planets[0,0,-1,0], 'y': planets[0,0,-1,1], 'line': 'k*', 'ms': 14, 'mfc': 'none'},
            7: {'x': planets[1,0,-1,0], 'y': planets[1,0,-1,1], 'line': 'b*', 'ms': 14, 'mfc': 'none'},
            8: {'x': planets[2,0,-1,0], 'y': planets[2,0,-1,1], 'line': 'r*', 'ms': 14, 'mfc': 'none'},
            # Time Sequence
            9:  {'x': planets[0,0,:tend,0][::tstep], 'y': planets[0,0,:tend,1][::tstep], 'lw': 0, 'line': 'ko', 'ms':2},
            10: {'x': planets[1,0,:tend,0][::tstep], 'y': planets[1,0,:tend,1][::tstep], 'lw': 0, 'line': 'bo', 'ms':2},
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            11: {'x': planets[2,0,:tend,0][::tstep], 'y': planets[2,0,:tend,1][::tstep], 'lw': 0, 'line': 'ro', 'ms':2},
            'xlabel': 'x', 'ylabel': 'y',
            'filename': os.path.join(figdir, title + '.png'),
            'grid': True,
            'show': False
        })

specialdir = 'special'
simulation = parseNBodyData(os.path.join(specialdir, 'star.out'))
numPlanets = simulation['n']
time = simulation['time']
planets = simulation['planets']
tend = -1 # -1 takes the whole slice
tstep = 100

plawt.plot({
    'title': 'star',
    # Paths
    0: {'x': planets[0,0,:tend,0], 'y': planets[0,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'k-'},
    1: {'x': planets[1,0,:tend,0], 'y': planets[1,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'b-'},
    2: {'x': planets[2,0,:tend,0], 'y': planets[2,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'r-'},
    3: {'x': planets[3,0,:tend,0], 'y': planets[3,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'g-'},
    4: {'x': planets[4,0,:tend,0], 'y': planets[4,0,:tend,1], 'lw': 0.8, 'alpha': 0.5, 'line': 'c-'},
    # Start
    5: {'x': planets[0,0,0,0], 'y': planets[0,0,0,1], 'line': 'ko', 'ms': 10},
    6: {'x': planets[1,0,0,0], 'y': planets[1,0,0,1], 'line': 'bo', 'ms': 10},
    7: {'x': planets[2,0,0,0], 'y': planets[2,0,0,1], 'line': 'ro', 'ms': 10},
    8: {'x': planets[3,0,0,0], 'y': planets[3,0,0,1], 'line': 'go', 'ms': 10},
    9: {'x': planets[4,0,0,0], 'y': planets[4,0,0,1], 'line': 'co', 'ms': 10},
    # Time
    10: {'x': planets[0,0,:tend,0][::tstep], 'y': planets[0,0,:tend,1][::tstep], 'lw': 0, 'line': 'ko', 'ms':2},
    11: {'x': planets[1,0,:tend,0][::tstep], 'y': planets[1,0,:tend,1][::tstep], 'lw': 0, 'line': 'bo', 'ms':2},
    12: {'x': planets[2,0,:tend,0][::tstep], 'y': planets[2,0,:tend,1][::tstep], 'lw': 0, 'line': 'ro', 'ms':2},
    13: {'x': planets[3,0,:tend,0][::tstep], 'y': planets[3,0,:tend,1][::tstep], 'lw': 0, 'line': 'go', 'ms':2},
    14: {'x': planets[4,0,:tend,0][::tstep], 'y': planets[4,0,:tend,1][::tstep], 'lw': 0, 'line': 'co', 'ms':2},
    # Final
    15: {'x': planets[0,0,-1,0], 'y': planets[0,0,-1,1], 'line': 'k*', 'ms': 14, 'mfc': 'none'},
    16: {'x': planets[1,0,-1,0], 'y': planets[1,0,-1,1], 'line': 'b*', 'ms': 14, 'mfc': 'none'},
    17: {'x': planets[2,0,-1,0], 'y': planets[2,0,-1,1], 'line': 'r*', 'ms': 14, 'mfc': 'none'},
    18: {'x': planets[3,0,-1,0], 'y': planets[3,0,-1,1], 'line': 'g*', 'ms': 14, 'mfc': 'none'},
    19: {'x': planets[4,0,-1,0], 'y': planets[4,0,-1,1], 'line': 'c*', 'ms': 14, 'mfc': 'none'},
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 83.        'grid': True,
 84.        'xlabel': 'x', 'ylabel': 'y',
 85.        'filename': os.path.join(specialdir, 'star.png'),
 86.        'show': False
 87. })
 88.
 89. # plot an animation
 90. def saveanimation():
 91.     framesdir = '__frames'
 92.     if not os.path.exists(framesdir):
 93.         os.mkdir(framesdir)
 94.
 95.     for i, t in enumerate(time):
 96.         filename = os.path.join(framesdir, 'frame' + str(i) + '.png')
 97.         currplot = {
 98.             'filename': filename,
 99.             'ylim': (-1, 1),
100.             'xlim': (-2,2),
101.         }
102.
103.         for n, _ in enumerate(planets):
104.             currplot[n] = {'x': planets[n,0,i,0], 'y': planets[n,0,i,1], 'line': 'ko'}
105.
106.         if i % 50 == 0:
107.             print('frame' + str(i) + '...')
108.         plawt.plot(currplot)
109.
110.     with imageio.get_writer('figure8.mp4', mode='I', fps=20) as writer:
111.         for filename in os.listdir(framesdir):
112.             image = imageio.imread(os.path.join(framesdir, filename))
113.             writer.append_data(image)
114.
115.     shutil.rmtree(framesdir)
116.
117. threebodyplots()
118. # saveanimation()
```