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1 import numpy as np
2 from HW1 import convert_rv_kep
3
4 delta_t = 3600.0
5 # case 1
6 a = 8000.0
7 e = 0.1
8 inc = 30.0
9 Omega = 145.0
10 omega = 120.0
11 M_0 = 10.0
12
13 elems = np.array([a, e, inc, Omega, omega, M_0])
14
15 state_vec = convert_rv_kep.convert_rv_kep('keplerian',
16 elems, delta_t, 'state')
17 print('Convert from first set of elements given to state
18 vector:')
19 print('r_x = {0} km'.format(state_vec[0]))
20 print('r_y = {0} km'.format(state_vec[1]))
21 print('r_z = {0} km'.format(state_vec[2]))
22 print('v_x = {0} km/s'.format(state_vec[3]))
23 print('v_y = {0} km/s'.format(state_vec[4]))
24 print('v_z = {0} km/s'.format(state_vec[5]))
25 print('')
26
27 # case 2
28 delta_t = 3600.0
29 # case 1
30 a = -8000.0
31 e = 1.1
32 inc = 30.0
33 Omega = 145.0
34 omega = 120.0
35 M_0 = 10.0
36
37 elems = np.array([a, e, inc, Omega, omega, M_0])
38
39 state_vec = convert_rv_kep.convert_rv_kep('keplerian',
40 elems, delta_t, 'state')
41 print('Convert from second set of elements given to state
42 vector:')
43 print('r_x = {0} km'.format(state_vec[0]))
44 print('r_y = {0} km'.format(state_vec[1]))
45 print('r_z = {0} km'.format(state_vec[2]))
46 print('v_x = {0} km/s'.format(state_vec[3]))
47 print('v_y = {0} km/s'.format(state_vec[4]))
48 print('v_z = {0} km/s'.format(state_vec[5]))
49 print('')
50

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47 # case 3
48 state = np.array([-1264.61, 8013.81, -3371.25, -6.03962, -0
    .204398, 2.09672])
49
50 elems_out = convert_rv_kep.convert_rv_kep('state', state,
    delta_t, 'keplerian')
51 print('Convert from state vector back to first set of
    elements')
52 print('a = {0} km'.format(elems_out[0]))
53 print('e = {0}'.format(elems_out[1]))
54 print('i = {0} deg'.format(elems_out[2]))
55 print('Omega = {0} deg'.format(elems_out[3]))
56 print('omega = {0} deg'.format(elems_out[4]))
57 print('M_0 = {0} deg'.format(elems_out[5]))
58 print('')
59
60
61 # case 4
62 state = np.array([18877, 27406.6, -19212.8, 3.55968, 6.
    35532, -4.18447])
63
64 elems_out = convert_rv_kep.convert_rv_kep('state', state,
    delta_t, 'keplerian')
65 print('Convert from state vector back to second set of
    elements')
66 print('a = {0}'.format(elems_out[0]))
67 print('e = {0}'.format(elems_out[1]))
68 print('i = {0}'.format(elems_out[2]))
69 print('Omega = {0}'.format(elems_out[3]))
70 print('omega = {0}'.format(elems_out[4]))
71 print('M_0 = {0}'.format(elems_out[5]))
```