

Data Set 0
 ['38.899900', '-77.049000', '20.000000', '2458088.540278']
 Site Info:
 Latitude(deg): 0.6789313336965422 Longitude(deg):
 -1.344758735369111 Altitude(m): 0.02
 JD: 2458088.540278
 Sat 10062.0 Info:
 Range(km): 3041.302336 Azm(deg): 3.0352129681784388
 Elv(deg): 0.18757063943158572
 Range Rate(km/s): -1.697054 Azm Rate(deg/s):
 -0.0021026330564626085 Elv Rate(deg/s): 0.000590340166194562
 Semi Major Axis in Kilometers:
 7500.06613618
 Eccentricity:
 0.0736676593463
 Eccentricity Vector:
 [0.0065399 -0.06598813 -0.03208925]
 Inclination in Degrees:
 28.4192287763
 RAAN in Degrees:
 339.07464745
 Argument of Periapsis in Degrees:
 293.755872906
 True Anomaly in Degrees:
 100.538880837
 Semi Latus Rectum in Kilometers:
 7459.36384701
 Radius of Periapsis in Kilometers:
 6947.55381898
 Radius of Apoapsis in Kilometers:
 8052.57845337
 Line of Nodes Vector in Kilometers:
 [24239.39260972 -9268.41561929 0.]
 Orbit Period in Seconds:
 6464.10776933
 Sat Radius Vector (ECI):
 [7172.9607023826793, 1268.8123569434697, 2027.6003795227459]
 Sat Velocity Vector (ECI):
 [-1.42169431 6.43429354 2.97739881]

Data Set 2
 ['38.899900', '-77.049000', '20.000000', '2458088.888194']
 Site Info:
 Latitude(deg): 0.6789313336965422 Longitude(deg):
 -1.344758735369111 Altitude(m): 0.02
 JD: 2458088.888194
 Sat 10114.0 Info:
 Range(km): 1537.014973 Azm(deg): 2.181086513910965

Elv(deg): 0.23189531782120656
 Range Rate(km/s): -5.550028 Azm Rate(deg/s):
 -0.0030586022476574632 Elv Rate(deg/s): 0.0017564469993295335
 Semi Major Axis in Kilometers:
 6893.3188741
 Eccentricity:
 0.00141332040602
 Eccentricity Vector:
 [3.29079503e-04 7.43016095e-06 1.37445482e-03]
 Inclination in Degrees:
 97.2046557501
 RAAN in Degrees:
 149.433422981
 Argument of Periapsis in Degrees:
 101.409038361
 True Anomaly in Degrees:
 289.764445358
 Semi Latus Rectum in Kilometers:
 6893.30510487
 Radius of Periapsis in Kilometers:
 6883.57640587
 Radius of Apoapsis in Kilometers:
 6903.06134233
 Line of Nodes Vector in Kilometers:
 [-44777.80806671 26446.27751083 0.]
 Orbit Period in Seconds:
 5695.78387689
 Sat Radius Vector (ECI):
 [-4848.4656453833131, 3383.0315538977193, 3538.3254413617742]
 Sat Velocity Vector (ECI):
 [3.81309564 -1.3047109 6.45272897]

Data Set 4
 ['38.899900', '-77.049000', '20.000000', '2458088.556250']
 Site Info:
 Latitude(deg): 0.6789313336965422 Longitude(deg):
 -1.344758735369111 Altitude(m): 0.02
 JD: 2458088.55625
 Sat 10121.0 Info:
 Range(km): 2168.026061 Azm(deg): 4.997577438223353
 Elv(deg): 0.2069639352282908
 Range Rate(km/s): -2.251851 Azm Rate(deg/s):
 -0.0032445496261649387 Elv Rate(deg/s): 0.0005682268445717939
 Semi Major Axis in Kilometers:
 7150.41946465
 Eccentricity:
 0.0019941830173
 Eccentricity Vector:

[0.00144284 -0.0002485 0.00135396]
Inclination in Degrees:
74.0495395924
RAAN in Degrees:
185.554046179
Argument of Periapsis in Degrees:
135.077969648
True Anomaly in Degrees:
1.36539330104
Semi Latus Rectum in Kilometers:
7150.39102911
Radius of Periapsis in Kilometers:
7136.16021959
Radius of Apoapsis in Kilometers:
7164.67870972
Line of Nodes Vector in Kilometers:
[-51090.39821948 -4968.08981527 0.]
Orbit Period in Seconds:
6017.39094406
Sat Radius Vector (ECI):
[5278.0400194812, -844.44231726126077, 4728.007081182006]
Sat Velocity Vector (ECI):
[4.98691707 1.98176841 -5.2125825]

Data Set 6
['38.899900', '-77.049000', '20.000000', '2458088.846528']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.846528
Sat 10521.0 Info:
Range(km): 2263.213047 Azm(deg): 6.094366617706485
Elv(deg): 0.19174263956896792
Range Rate(km/s): -6.256821 Azm Rate(deg/s):
0.0007130542659022833 Elv Rate(deg/s): 0.0015265696835493603
Semi Major Axis in Kilometers:
7134.34655492
Eccentricity:
0.00199762496244
Eccentricity Vector:
[0.00015712 -0.00084366 -0.0018039]
Inclination in Degrees:
74.0266757394
RAAN in Degrees:
317.540595523
Argument of Periapsis in Degrees:
290.067544371
True Anomaly in Degrees:

189.912613543
Semi Latus Rectum in Kilometers:
7134.31808527
Radius of Periapsis in Kilometers:
7120.09480615
Radius of Apoapsis in Kilometers:
7148.59830369
Line of Nodes Vector in Kilometers:
[37823.12137754 -34609.23672007 0.]
Orbit Period in Seconds:
5997.11326439
Sat Radius Vector (ECI):
[-1485.0157280255007, 3668.4756096212031, 5952.8496381709874]
Sat Velocity Vector (ECI):
[-5.4592196 3.60402646 -3.58596063]

Data Set 8
['38.899900', '-77.049000', '20.000000', '2458088.655556']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.655556
Sat 10674.0 Info:
Range(km): 3004.571575 Azm(deg): 1.9479983333591901
Elv(deg): 0.19761499182352055
Range Rate(km/s): -1.475199 Azm Rate(deg/s):
-0.0023043582114081135 Elv Rate(deg/s): 0.00037646751965517687
Semi Major Axis in Kilometers:
7474.06541629
Eccentricity:
0.0165086970468
Eccentricity Vector:
[0.0028814 -0.00651423 -0.01489293]
Inclination in Degrees:
69.360657102
RAAN in Degrees:
61.9062171044
Argument of Periapsis in Degrees:
254.579013398
True Anomaly in Degrees:
135.159488863
Semi Latus Rectum in Kilometers:
7472.02845634
Radius of Periapsis in Kilometers:
7350.67833463
Radius of Apoapsis in Kilometers:
7597.45249796
Line of Nodes Vector in Kilometers:

[24050.44052617 45054.2381175 -0.]
Orbit Period in Seconds:
6430.5229242
Sat Radius Vector (ECI):
[1925.2850980498572, 6413.8406155964512, 3509.6373760993497]
Sat Velocity Vector (ECI):
[-3.61345742 -2.04621881 5.90484771]

Data Set 10
['38.899900', '-77.049000', '20.000000', '2458088.527778']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.527778
Sat 25338.0 Info:
Range(km): 2372.992941 Azm(deg): 4.537277216738833
Elv(deg): 0.1771210390406303
Range Rate(km/s): -1.096655 Azm Rate(deg/s):
0.0031845452064813737 Elv Rate(deg/s): 0.00026535985947321786
Semi Major Axis in Kilometers:
7183.88845372
Eccentricity:
0.000979398120411
Eccentricity Vector:
[6.60929583e-06 -1.55356702e-04 9.66975331e-04]
Inclination in Degrees:
98.7818560958
RAAN in Degrees:
346.314352176
Argument of Periapsis in Degrees:
87.4732108935
True Anomaly in Degrees:
306.155043882
Semi Latus Rectum in Kilometers:
7183.88156278
Radius of Periapsis in Kilometers:
7176.85256687
Radius of Apoapsis in Kilometers:
7190.92434057
Line of Nodes Vector in Kilometers:
[51382.87020928 -12512.15849766 0.]
Orbit Period in Seconds:
6059.68877244
Sat Radius Vector (ECI):
[5664.8366922111563, -2004.2244749562296, 3929.5388083475191]
Sat Velocity Vector (ECI):
[-4.23919913 0.05764079 6.12988063]

Data Set 12

['38.899900', '-77.049000', '20.000000', '2458088.516667']

Site Info:

Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.516667

Sat 25544.0 Info:

Range(km): 1393.766001 Azm(deg): 5.782742373272857
Elv(deg): 0.19881057726772172
Range Rate(km/s): -1.587409 Azm Rate(deg/s):
0.005237331659507024 Elv Rate(deg/s): 0.0004882907648304536
Semi Major Axis in Kilometers:
6780.3057115

Eccentricity:

1.4582787956e-05

Eccentricity Vector:

[-6.29617117e-06 1.28042950e-05 -3.01097392e-06]

Inclination in Degrees:

51.6442001045

RAAN in Degrees:

286.571638653

Argument of Periapsis in Degrees:

195.266107726

True Anomaly in Degrees:

237.912967662

Semi Latus Rectum in Kilometers:

6780.30571006

Radius of Periapsis in Kilometers:

6780.20683574

Radius of Apoapsis in Kilometers:

6780.40458726

Line of Nodes Vector in Kilometers:

[11627.22013309 -39073.36893893 0.]

Orbit Period in Seconds:

5556.28945917

Sat Radius Vector (ECI):

[4419.8162900636025, -731.91719998298458, 5089.4772771995304]

Sat Velocity Vector (ECI):

[-0.77365854 7.42708136 1.73982403]

Data Set 14

['38.899900', '-77.049000', '20.000000', '2458088.500000']

Site Info:

Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.5

Sat 29155.0 Info:

Range(km): 37430.365431 Azm(deg): 3.166580026345113
Elv(deg): 0.7847508207778836
Range Rate(km/s): -0.001508 Azm Rate(deg/s):
1.0471975511965977e-07 Elv Rate(deg/s): -3.490658503988659e-08
Semi Major Axis in Kilometers:
42175.5045895
Eccentricity:
0.000590090707208
Eccentricity Vector:
[-1.77506915e-04 5.62759561e-04 -1.18802730e-07]
Inclination in Degrees:
0.0255789786198
RAAN in Degrees:
134.312332065
Argument of Periapsis in Degrees:
333.194102198
True Anomaly in Degrees:
244.589997107
Semi Latus Rectum in Kilometers:
42175.4899037
Radius of Periapsis in Kilometers:
42150.6172162
Radius of Apoapsis in Kilometers:
42200.3919628
Line of Nodes Vector in Kilometers:
[-40.4360796 41.41855176 0.]
Orbit Period in Seconds:
86198.831694
Sat Radius Vector (ECI):
[41785.439120906638, -5800.8635938504694, -11.539044865418418]
Sat Velocity Vector (ECI):
[4.20997998e-01 3.04449921e+00 -1.08396598e-03]

Data Set 16

['38.899900', '-77.049000', '20.000000', '2458088.858333']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.858333
Sat 33591.0 Info:
Range(km): 2345.226157 Azm(deg): 0.5040515243082754
Elv(deg): 0.2079045455220681
Range Rate(km/s): -6.023703 Azm Rate(deg/s):
0.0012338256081123515 Elv Rate(deg/s): 0.0014945603450677843
Semi Major Axis in Kilometers:
7229.86828501
Eccentricity:

0.00145290492084
Eccentricity Vector:
[-0.00084893 0.00112843 0.0003419]
Inclination in Degrees:
99.1022240446
RAAN in Degrees:
304.731225411
Argument of Periapsis in Degrees:
166.212267674
True Anomaly in Degrees:
318.647108213
Semi Latus Rectum in Kilometers:
7229.85302325
Radius of Periapsis in Kilometers:
7219.3639738
Radius of Apoapsis in Kilometers:
7240.37259622
Line of Nodes Vector in Kilometers:
[30199.33144555 -43562.6287111 0.]
Orbit Period in Seconds:
6117.95850078
Sat Radius Vector (ECI):
[-3122.1863622025476, 2858.2766316376228, 5851.4230654721459]
Sat Velocity Vector (ECI):
[-2.91954854 5.39278295 -4.20084398]

Data Set 18
['38.899900', '-77.049000', '20.000000', '2458088.500000']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.5
Sat 36516.0 Info:
Range(km): 38015.587606 Azm(deg): 3.8160140564991822
Elv(deg): 0.6489633148548063
Range Rate(km/s): 0.000363 Azm Rate(deg/s):
1.2217304763960308e-07 Elv Rate(deg/s): 3.490658503988659e-08
Semi Major Axis in Kilometers:
42169.3377497
Eccentricity:
0.000373491484039
Eccentricity Vector:
[-3.70866811e-04 4.42003376e-05 -1.64631260e-07]
Inclination in Degrees:
0.0542849395696
RAAN in Degrees:
325.477882329
Argument of Periapsis in Degrees:

207.725609264
True Anomaly in Degrees:
153.15392347
Semi Latus Rectum in Kilometers:
42169.3318673
Radius of Periapsis in Kilometers:
42153.5878612
Radius of Apoapsis in Kilometers:
42185.0876382
Line of Nodes Vector in Kilometers:
[101.20509722 -69.6138732 0.]
Orbit Period in Seconds:
86179.9265869
Sat Radius Vector (ECI):
[35118.080488654719, -23370.039081983527, 0.61349418055260685]
Sat Velocity Vector (ECI):
[1.70315305 2.55838652 0.0029116]

Data Set 20
['38.899900', '-77.049000', '20.000000', '2458088.519444']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.519444
Sat 37820.0 Info:
Range(km): 1021.106383 Azm(deg): 5.231277042518686
Elv(deg): 0.2262192452943332
Range Rate(km/s): -6.52255 Azm Rate(deg/s):
0.0023092276800211775 Elv Rate(deg/s): 0.002503360652720507
Semi Major Axis in Kilometers:
6672.81136783
Eccentricity:
0.00158502946516
Eccentricity Vector:
[4.64512371e-04 1.51543606e-03 -4.54935677e-07]
Inclination in Degrees:
42.7584001514
RAAN in Degrees:
252.940834011
Argument of Periapsis in Degrees:
180.024222788
True Anomaly in Degrees:
275.088710217
Semi Latus Rectum in Kilometers:
6672.7946036
Radius of Periapsis in Kilometers:
6662.2347652
Radius of Apoapsis in Kilometers:

6683.38797046
Line of Nodes Vector in Kilometers:
[-10271.49115412 -33472.86838012 0.]
Orbit Period in Seconds:
5424.68120504
Sat Radius Vector (ECI):
[4838.8963312548585, -862.91013440669803, 4511.5561697784842]
Sat Velocity Vector (ECI):
[1.76623325 7.51039368 -0.47594131]

Data Set 22
['38.899900', '-77.049000', '20.000000', '2458088.572222']
Site Info:
Latitude(deg): 0.6789313336965422 Longitude(deg):
-1.344758735369111 Altitude(m): 0.02
JD: 2458088.572222
Sat 38771.0 Info:
Range(km): 2097.577837 Azm(deg): 2.5882427861224886
Elv(deg): 0.25659437963738935
Range Rate(km/s): -6.261186 Azm Rate(deg/s):
-0.0008742179690314398 Elv Rate(deg/s): 0.0018103427666311183
Semi Major Axis in Kilometers:
7198.3858012
Eccentricity:
0.000119673406672
Eccentricity Vector:
[-1.00092157e-04 -6.50443420e-05 8.51574436e-06]
Inclination in Degrees:
98.6705251142
RAAN in Degrees:
32.39428091
Argument of Periapsis in Degrees:
175.872232546
True Anomaly in Degrees:
208.834179854
Semi Latus Rectum in Kilometers:
7198.3856981
Radius of Periapsis in Kilometers:
7197.52434585
Radius of Apoapsis in Kilometers:
7199.24725655
Line of Nodes Vector in Kilometers:
[44712.94275501 28369.43612907 -0.]
Orbit Period in Seconds:
6078.04103116
Sat Radius Vector (ECI):
[5765.3950212613727, 3120.8067915693346, 2974.6273933076391]
Sat Velocity Vector (ECI):

`[-2.08038096 -2.52673285 6.6820373]`