

D.1 PANEL

This is an interactive program directly from Moran, with modifications to improve computational speed for multiple angle of attack cases. A sample output that can be used to verify that the program is working properly is given below.

```
MORAN:   PROGRAM PANEL

INPUT NLOWER,NUPPER

30,30

INPUT NACA NUMBER

4412

      BODY SHAPE

      I          X          Y

      1          1.00000    0.00000
      2          0.99721   -0.00002
      3          0.98887   -0.00009
      4          0.97509   -0.00022
      5          0.95603   -0.00041
      6          0.93193   -0.00069
      7          0.90307   -0.00108
      8          0.86980   -0.00162
      9          0.83250   -0.00233
     10          0.79162   -0.00325
     11          0.74760   -0.00441
     12          0.70097   -0.00583
     13          0.65223   -0.00751
     14          0.60193   -0.00942
     15          0.55061   -0.01152
     16          0.49883   -0.01372
     17          0.44715   -0.01592
     18          0.39616   -0.01798
     19          0.34711   -0.02015
     20          0.29972   -0.02250
     21          0.25444   -0.02479
     22          0.21167   -0.02679
     23          0.17183   -0.02825
     24          0.13529   -0.02895
     25          0.10242   -0.02869
     26          0.07358   -0.02732
     27          0.04909   -0.02469
     28          0.02925   -0.02070
     29          0.01432   -0.01529
     30          0.00451   -0.00839
     31          0.00000    0.00000
     32          0.00096    0.00949
     33          0.00753    0.01960
     34          0.01969    0.03019
     35          0.03736    0.04105
```

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36	0.06039	0.05187
37	0.08856	0.06233
38	0.12157	0.07207
39	0.15904	0.08074
40	0.20054	0.08799
41	0.24556	0.09354
42	0.29354	0.09715
43	0.34387	0.09866
44	0.39593	0.09797
45	0.44833	0.09541
46	0.50117	0.09150
47	0.55392	0.08637
48	0.60599	0.08018
49	0.65679	0.07312
50	0.70577	0.06538
51	0.75240	0.05719
52	0.79617	0.04877
53	0.83663	0.04036
54	0.87334	0.03220
55	0.90594	0.02452
56	0.93409	0.01756
57	0.95751	0.01152
58	0.97597	0.00661
59	0.98928	0.00298
60	0.99731	0.00075

INPUT ALPHA IN DEGREES:

2.

PRESSURE DISTRIBUTION

I	X	Y	CP
1	0.9986	0.0000	0.38467
2	0.9930	-0.0001	0.30343
3	0.9820	-0.0002	0.25675
4	0.9656	-0.0003	0.22763
5	0.9440	-0.0006	0.20840
6	0.9175	-0.0009	0.19523
7	0.8864	-0.0014	0.18587
8	0.8512	-0.0020	0.17886
9	0.8121	-0.0028	0.17317
10	0.7696	-0.0038	0.16801
11	0.7243	-0.0051	0.16280
12	0.6766	-0.0067	0.15713
13	0.6271	-0.0085	0.15077
14	0.5763	-0.0105	0.14373
15	0.5247	-0.0126	0.13638
16	0.4730	-0.0148	0.12985
17	0.4217	-0.0170	0.12807
18	0.3716	-0.0191	0.12602
19	0.3234	-0.0213	0.11687
20	0.2771	-0.0236	0.10199
21	0.2331	-0.0258	0.08422
22	0.1917	-0.0275	0.06568
23	0.1536	-0.0286	0.04878
24	0.1189	-0.0288	0.03693
25	0.0880	-0.0280	0.03573

26	0.0613	-0.0260	0.05561
27	0.0392	-0.0227	0.11840
28	0.0218	-0.0180	0.27208
29	0.0094	-0.0118	0.60051
30	0.0023	-0.0042	0.98725
31	0.0005	0.0047	0.62389
32	0.0042	0.0145	-0.17221
33	0.0136	0.0249	-0.59380
34	0.0285	0.0356	-0.77475
35	0.0489	0.0465	-0.86631
36	0.0745	0.0571	-0.92155
37	0.1051	0.0672	-0.95698
38	0.1403	0.0764	-0.97726
39	0.1798	0.0844	-0.98317
40	0.2231	0.0908	-0.97429
41	0.2696	0.0953	-0.94986
42	0.3187	0.0979	-0.90860
43	0.3699	0.0983	-0.84568
44	0.4221	0.0967	-0.76754
45	0.4747	0.0935	-0.69391
46	0.5275	0.0889	-0.62775
47	0.5800	0.0833	-0.56419
48	0.6314	0.0766	-0.50177
49	0.6813	0.0692	-0.43979
50	0.7291	0.0613	-0.37777
51	0.7743	0.0530	-0.31529
52	0.8164	0.0446	-0.25196
53	0.8550	0.0363	-0.18742
54	0.8896	0.0284	-0.12130
55	0.9200	0.0210	-0.05316
56	0.9458	0.0145	0.01760
57	0.9667	0.0091	0.09212
58	0.9826	0.0048	0.17280
59	0.9933	0.0019	0.26569
60	0.9987	0.0004	0.38467

AT ALPHA = 2.000

CD = -0.00078 CL = 0.73347 CM = -0.28985

Another angle of attack? (Y/N):
n

STOP