

```
1 // .NET 8. @ C:\2302\Misc_10\App_41
2 // Dennis G. Zill "Differential Equations with Boundary-Value
3 // Problems 9th Edition" Page 322 Example 1
4
5 using Matrix_0;
6
7 // 已知數據(空間維度m=2, 狀態維度r=2)
8 double[,] M = { { 1, 0 }, { 0, 1 } };
9 double[,] C = { { 0, 0 }, { 0, 0 } };
10 double[,] K = { { 10, -4 }, { -4, 4 } };
11 // t=0時的初始值[y' 0|y' 1|y0|y1] = [1|-1|0|0]
12 double[,] y0Start = { { 1 }, { -1 }, { 0 }, { 0 } };
13
14 // 建構系統矩陣A
15 SysMatrix2 SysMat = new SysMatrix2(M, C, K);
16 ReMatrix A = SysMat.GetMatrix;
17
18 // 特徵矩陣D與模態矩陣Q。
19 EIG eig = new EIG(A);
20 CxMatrix D = eig.CxMatrixD;
21 CxMatrix V = eig.CxVector;
22 CxMatrix Q = eig.CxMatrixQ;
23
24 // 係數向量d
25 CxHexp Hexp = new CxHexp(D, Q, 0);
26 CxMatrix MatTemp = Hexp.GetCxMatrix;
27 CxMatrix d = ^MatTemp * y0Start;
28
29 // 列印系統特徵矩陣、模態矩陣、和係數向量。
30 Console.WriteLine("\n***{0,6} 系{0,5} 統{0,5} 與{0,5} 狀{0,5} 態{0,5} 參{0,5} 數{0,6} ***\n", "");
31 Console.WriteLine("\n***{0,5} 系統特徵值V{0,5} ***\n{1}\n", "", new PR(V));
32 Console.WriteLine("\n***{0,5} 系統特徵矩陣D{0,5} ***\n{1}\n", "", new PR(D));
33 Console.WriteLine("\n***{0,5} 系統模態矩陣Q{0,5} ***\n{1}\n", "", new PR(Q));
34 Console.WriteLine("\n***{0,5} 係數向量d{0,5} ***\n{1}\n", "", new PR(d));
35
36 // 建構Disp、Vel、和Acc三個空的儲存矩陣
37 double step = 0.25;
38 int iRow = (int)(20 / step + 1);
39 int iCol = M.GetLength(1) + 1;
40 ReMatrix Disp = new ReMatrix(iRow, iCol);
41 ReMatrix Vel = new ReMatrix(iRow, iCol);
42 ReMatrix Acc = new ReMatrix(iRow, iCol);
43
```

```

44 // 將計算的結果存入Vel、Disp、和Acc矩陣中
45 for (int i = 0; i != iRow; i++)
46 {
47     double t = step * i;
48     Hexp = new CxHexp(D, Q, t);
49     MatTemp = Hexp.GetCxMatrix;
50     ReMatrix yh_Re = (ReMatrix)(MatTemp * d);
51
52     // 速度
53     Vel.Matrix[i, 0] = t;
54     Vel.Matrix[i, 1] = yh_Re.Matrix[0, 0];
55     Vel.Matrix[i, 2] = yh_Re.Matrix[1, 0];
56     // 位移
57     Disp.Matrix[i, 0] = t;
58     Disp.Matrix[i, 1] = yh_Re.Matrix[2, 0];
59     Disp.Matrix[i, 2] = yh_Re.Matrix[3, 0];
60     // 加速度
61     ReMatrix yhDot_Re = A * yh_Re;
62     Acc.Matrix[i, 0] = t;
63     Acc.Matrix[i, 1] = yhDot_Re.Matrix[0, 0];
64     Acc.Matrix[i, 2] = yhDot_Re.Matrix[1, 0];
65 }
66
67 // 列印節點之狀態響應(變位, 速度, 和加速), 適用於Excel繪圖
68 Console.WriteLine("\n****{0,6}空{0,5}間{0,5}狀{0,5}態{0,5}響{0,5}應{0,6}▶
    ****\n", "");
69 Console.WriteLine("\n{0,5}***位移反應量***{0,5}\n{0,8}時間(秒)" +
70 "{0,8}第0點位移{0,8}第1點位移\n\n{1}", "", new PR(Disp));
71 Console.WriteLine("\n{0,5}***速度反應量***{0,5}\n{0,8}時間(秒)" +
72 "{0,8}第0點速度{0,8}第1點速度\n\n{1}", "", new PR(Vel));
73 Console.WriteLine("\n****{0,5}加速度反應量{0,5}***\n{0,8}時間(秒)" +
74 "{0,8}第0點加速度{0,7}第1點加速度\n\n{1}", "", new PR(Acc));
75
76 // 列印時間、變位、速度、和加速度等序列, 適用於Matplotlib.pyplot套件▶
    繪圖。
77 Console.WriteLine("\n時間序列 :\n{0}\n", new PR4(Disp, 0, "{0,8:F2}"));
78 Console.WriteLine("\n第0點變位序列 :\n{0}\n", new PR4(Disp, 1));
79 Console.WriteLine("\n第1點變位序列 :\n{0}\n", new PR4(Disp, 2));
80 Console.WriteLine("\n第0點速度序列 :\n{0}\n", new PR4(Vel, 1));
81 Console.WriteLine("\n第1點速度序列 :\n{0}\n", new PR4(Vel, 2));
82 Console.WriteLine("\n第0點加速度序列\n{0}\n", new PR4(Acc, 1));
83 Console.WriteLine("\n第1點加速度序列\n{0}\n", new PR4(Acc, 2));
84 Console.WriteLine("\n\n");
85
86 /* 輸出
87 ****      系      統      與      狀      態      參      數      ****
88

```

```

89  ***      系統特徵值V      ***
90      0.00000 + 3.46410i
91      0.00000 - 3.46410i
92      0.00000 + 1.41421i
93      0.00000 - 1.41421i
94
95  ***      系統特徵矩陣D      ***
96  -0.00000 + 3.46410i, 0.00000 + 0.00000i,
97      0.00000 + 0.00000i, 0.00000 + 0.00000i
98
99      0.00000 + 0.00000i, -0.00000 - 3.46410i,
100     0.00000 + 0.00000i, 0.00000 + 0.00000i
101
102     0.00000 + 0.00000i, 0.00000 + 0.00000i,
103     0.00000 + 1.41421i, 0.00000 + 0.00000i
104
105     0.00000 + 0.00000i, 0.00000 + 0.00000i,
106     0.00000 + 0.00000i, 0.00000 - 1.41421i
107
108  ***      系統模態矩陣Q      ***
109     0.85934 + 0.00000i, 0.85934 + 0.00000i,
110     0.36515 + 0.00000i, 0.36515 + 0.00000i
111
112    -0.42967 + 0.00000i, -0.42967 + 0.00000i,
113     0.73030 + 0.00000i, 0.73030 + 0.00000i
114
115     0.00000 - 0.24807i, 0.00000 + 0.24807i,
116     0.00000 - 0.25820i, 0.00000 + 0.25820i
117
118     0.00000 + 0.12403i, 0.00000 - 0.12403i,
119     0.00000 - 0.51640i, 0.00000 + 0.51640i
120
121  ***      係數向量d      ***
122     0.69821 + 0.00000i
123     0.69821 + 0.00000i
124    -0.27386 + 0.00000i
125    -0.27386 + 0.00000i
126
127  ****      空      間      狀      態      響      應      ****
128
129      ***位移反應量***
130      時間(秒)      第0點位移      第1點位移
131      0.00000      0.00000      0.00000
132      0.25000      0.21492      -0.22987
133      0.50000      0.25004      -0.35470
134      0.75000      0.05573      -0.33640
135      1.00000      -0.24948      -0.22449

```

136	1.25000	-0.46009	-0.11667
137	1.50000	-0.42719	-0.08772
138	1.75000	-0.16339	-0.13694
139	2.00000	0.16470	-0.19127
140	2.25000	0.35150	-0.16148
141	2.50000	0.29406	-0.01133
142	2.75000	0.06104	0.20983
143	3.00000	-0.15916	0.39484
144	3.25000	-0.19405	0.44820
145	3.50000	-0.01072	0.34900
146	3.75000	0.25996	0.16362
147	4.00000	0.41574	-0.00063
148	4.25000	0.32686	-0.06818
149	4.50000	0.02989	-0.04347
150	4.75000	-0.29475	-0.00140
151	5.00000	-0.44636	-0.02744
152	5.25000	-0.34180	-0.15056
153	5.50000	-0.07117	-0.31695
154	5.75000	0.16771	-0.42386
155	6.00000	0.20952	-0.39017
156	6.25000	0.03749	-0.21425
157	6.50000	-0.20635	0.02175
158	6.75000	-0.32377	0.20462
159	7.00000	-0.20324	0.26322
160	7.25000	0.09796	0.21151
161	7.50000	0.39066	0.13182
162	7.75000	0.48419	0.11123
163	8.00000	0.31878	0.17642
164	8.25000	0.00684	0.27333
165	8.50000	-0.24565	0.30628
166	8.75000	-0.28252	0.20873
167	9.00000	-0.10476	-0.00449
168	9.25000	0.13358	-0.24096
169	9.50000	0.23739	-0.38862
170	9.75000	0.11133	-0.38795
171	10.00000	-0.17031	-0.26839
172	10.25000	-0.41411	-0.12402
173	10.50000	-0.44314	-0.04607
174	10.75000	-0.22224	-0.05999
175	11.00000	0.11545	-0.11112
176	11.25000	0.35943	-0.10880
177	11.50000	0.36673	0.00308
178	11.75000	0.15905	0.19940
179	12.00000	-0.09587	0.38483
180	12.25000	-0.20504	0.45571
181	12.50000	-0.08778	0.36968
182	12.75000	0.16696	0.17462

183	13.00000	0.36405	-0.02355
184	13.25000	0.34155	-0.13153
185	13.50000	0.08761	-0.12865
186	13.75000	-0.24773	-0.07456
187	14.00000	-0.45468	-0.06013
188	14.25000	-0.40817	-0.13687
189	14.50000	-0.15337	-0.27557
190	14.75000	0.12764	-0.38380
191	15.00000	0.24444	-0.37035
192	15.25000	0.13147	-0.21132
193	15.50000	-0.10790	0.02893
194	15.75000	-0.27710	0.23718
195	16.00000	-0.22823	0.32420
196	16.25000	0.03016	0.28046
197	16.50000	0.33595	0.17648
198	16.75000	0.48512	0.10818
199	17.00000	0.37409	0.12661
200	17.25000	0.07243	0.20154
201	17.50000	-0.22502	0.24496
202	17.75000	-0.33324	0.17738
203	18.00000	-0.20426	-0.01013
204	18.25000	0.04250	-0.24264
205	18.50000	0.20792	-0.40710
206	18.75000	0.15650	-0.42564
207	19.00000	-0.08581	-0.30576
208	19.25000	-0.34866	-0.13248
209	19.50000	-0.43720	-0.00840
210	19.75000	-0.27055	0.01617
211	20.00000	0.05899	-0.02598
212			
213	***速度反應量***		
214	時間(秒)	第0點速度	第1點速度
215	0.00000	1.00000	-1.00000
216	0.25000	0.58980	-0.76397
217	0.50000	-0.34472	-0.20776
218	0.75000	-1.12473	0.31822
219	1.00000	-1.16932	0.50669
220	1.25000	-0.40848	0.30209
221	1.50000	0.66276	-0.06981
222	1.75000	1.32798	-0.27106
223	2.00000	1.14918	-0.09891
224	2.25000	0.27150	0.36384
225	2.50000	-0.68137	0.80239
226	2.75000	-1.04714	0.89027
227	3.00000	-0.59027	0.52147
228	3.25000	0.33488	-0.10947
229	3.50000	1.03764	-0.63639

230	3.75000	0.98231	-0.76972
231	4.00000	0.17047	-0.49033
232	4.25000	-0.85551	-0.05376
233	4.50000	-1.39079	0.19702
234	4.75000	-1.06230	0.07757
235	5.00000	-0.09099	-0.30718
236	5.25000	0.86250	-0.63940
237	5.50000	1.16021	-0.61797
238	5.75000	0.63201	-0.17891
239	6.00000	-0.30947	0.44983
240	6.25000	-0.96446	0.89883
241	6.50000	-0.84346	0.90829
242	6.75000	-0.01543	0.50405
243	7.00000	0.93873	-0.02466
244	7.25000	1.33504	-0.32944
245	7.50000	0.86961	-0.24519
246	7.75000	-0.16423	0.09982
247	8.00000	-1.07829	0.38275
248	8.25000	-1.26926	0.32347
249	8.50000	-0.63856	-0.10814
250	8.75000	0.34260	-0.66211
251	9.00000	0.96849	-0.97773
252	9.25000	0.79769	-0.83397
253	9.50000	-0.03596	-0.30495
254	9.75000	-0.91927	0.28885
255	10.00000	-1.19483	0.59990
256	10.25000	-0.62831	0.48960
257	10.50000	0.42146	0.11597
258	10.75000	1.25027	-0.18759
259	11.00000	1.30015	-0.15581
260	11.25000	0.54914	0.21527
261	11.50000	-0.47486	0.66225
262	11.75000	-1.06577	0.84014
263	12.00000	-0.83473	0.56903
264	12.25000	0.01942	-0.03238
265	12.50000	0.85463	-0.62152
266	12.75000	1.04284	-0.86314
267	13.00000	0.41724	-0.65558
268	13.25000	-0.60601	-0.19390
269	13.50000	-1.31786	0.17354
270	13.75000	-1.21428	0.19331
271	14.00000	-0.35161	-0.11527
272	14.25000	0.69109	-0.47786
273	14.50000	1.21635	-0.56536
274	14.75000	0.89490	-0.23480
275	15.00000	-0.00743	0.35989
276	15.25000	-0.82181	0.86655

277	15.50000	-0.95159	0.97454
278	15.75000	-0.29536	0.62783
279	16.00000	0.68039	0.06196
280	16.25000	1.27035	-0.36076
281	16.50000	1.02935	-0.40194
282	16.75000	0.08958	-0.10769
283	17.00000	-0.92789	0.23319
284	17.25000	-1.34545	0.30267
285	17.50000	-0.90137	-0.01290
286	17.75000	0.06986	-0.53470
287	18.00000	0.87584	-0.91205
288	18.25000	0.95487	-0.86727
289	18.50000	0.27087	-0.39275
290	18.75000	-0.66365	0.23885
291	19.00000	-1.15237	0.65906
292	19.25000	-0.81025	0.65360
293	19.50000	0.16022	0.30322
294	19.75000	1.10687	-0.08266
295	20.00000	1.38330	-0.19167
296			
297	*** 加速度反應量	***	
298	時間(秒)	第0點加速度	第1點加速度
299	0.00000	-0.00001	0.00000
300	0.25000	-3.06865	1.77915
301	0.50000	-3.91924	2.41899
302	0.75000	-1.90291	1.56854
303	1.00000	1.59692	-0.10000
304	1.25000	4.13427	-1.37370
305	1.50000	3.92096	-1.35785
306	1.75000	1.08615	-0.10580
307	2.00000	-2.41207	1.42387
308	2.25000	-4.16093	2.05191
309	2.50000	-2.98595	1.22157
310	2.75000	0.22894	-0.59516
311	3.00000	3.17096	-2.21599
312	3.25000	3.73331	-2.56899
313	3.50000	1.50325	-1.43891
314	3.75000	-1.94513	0.38535
315	4.00000	-4.15996	1.66549
316	4.25000	-3.54126	1.58013
317	4.50000	-0.47276	0.29344
318	4.75000	2.94195	-1.17342
319	5.00000	4.35380	-1.67566
320	5.25000	2.81575	-0.76496
321	5.50000	-0.55606	0.98310
322	5.75000	-3.37252	2.36626
323	6.00000	-3.65585	2.39875

324	6.25000	-1.23187	1.00696
325	6.50000	2.15049	-0.91239
326	6.75000	4.05613	-2.11353
327	7.00000	3.08526	-1.86584
328	7.25000	-0.13356	-0.45420
329	7.50000	-3.37930	1.03536
330	7.75000	-4.39701	1.49184
331	8.00000	-2.48209	0.56943
332	8.25000	1.02494	-1.06597
333	8.50000	3.68159	-2.20770
334	8.75000	3.66015	-1.96501
335	9.00000	1.02961	-0.40107
336	9.25000	-2.29966	1.49816
337	9.50000	-3.92842	2.50406
338	9.75000	-2.66510	1.99713
339	10.00000	0.62954	0.39233
340	10.25000	3.64501	-1.16036
341	10.50000	4.24715	-1.58829
342	10.75000	1.98240	-0.64900
343	11.00000	-1.59904	0.90631
344	11.25000	-4.02951	1.87293
345	11.50000	-3.65500	1.45460
346	11.75000	-0.79295	-0.16137
347	12.00000	2.49801	-1.92279
348	12.25000	3.87320	-2.64298
349	12.50000	2.35652	-1.82985
350	12.75000	-0.97113	-0.03063
351	13.00000	-3.73471	1.55041
352	13.25000	-3.94160	1.89232
353	13.50000	-1.39072	0.86505
354	13.75000	2.17902	-0.69265
355	14.00000	4.30628	-1.57820
356	14.25000	3.53423	-1.08522
357	14.50000	0.43145	0.48878
358	14.75000	-2.81159	2.04576
359	15.00000	-3.92586	2.45919
360	15.25000	-2.15997	1.37115
361	15.50000	1.19476	-0.54733
362	15.75000	3.71966	-2.05709
363	16.00000	3.57907	-2.20970
364	16.25000	0.82022	-1.00121
365	16.50000	-2.65356	0.63787
366	16.75000	-4.41847	1.50775
367	17.00000	-3.23445	0.98993
368	17.25000	0.08186	-0.51644
369	17.50000	3.23009	-1.87995
370	17.75000	4.04190	-2.04248

371	18.00000	2.00209	-0.77653
372	18.25000	-1.39562	1.14059
373	18.50000	-3.70759	2.46007
374	18.75000	-3.26758	2.32857
375	19.00000	-0.36492	0.87979
376	19.25000	2.95668	-0.86472
377	19.50000	4.33845	-1.71523
378	19.75000	2.77016	-1.14687
379	20.00000	-0.69378	0.33986

380

381

382 時間序列 :

383

384	0.00,	0.25,	0.50,	0.75,	1.00,
385	1.25,	1.50,	1.75,	2.00,	2.25,
386	2.50,	2.75,	3.00,	3.25,	3.50,
387	3.75,	4.00,	4.25,	4.50,	4.75,
388	5.00,	5.25,	5.50,	5.75,	6.00,
389	6.25,	6.50,	6.75,	7.00,	7.25,
390	7.50,	7.75,	8.00,	8.25,	8.50,
391	8.75,	9.00,	9.25,	9.50,	9.75,
392	10.00,	10.25,	10.50,	10.75,	11.00,
393	11.25,	11.50,	11.75,	12.00,	12.25,
394	12.50,	12.75,	13.00,	13.25,	13.50,
395	13.75,	14.00,	14.25,	14.50,	14.75,
396	15.00,	15.25,	15.50,	15.75,	16.00,
397	16.25,	16.50,	16.75,	17.00,	17.25,
398	17.50,	17.75,	18.00,	18.25,	18.50,
399	18.75,	19.00,	19.25,	19.50,	19.75,
400	20.00,				

401

402 位移序列 :

403

404 第 0 點

405	0.0000,	0.2149,	0.2500,	0.0557,	-0.2495,
406	-0.4601,	-0.4272,	-0.1634,	0.1647,	0.3515,
407	0.2941,	0.0610,	-0.1592,	-0.1941,	-0.0107,
408	0.2600,	0.4157,	0.3269,	0.0299,	-0.2948,
409	-0.4464,	-0.3418,	-0.0712,	0.1677,	0.2095,
410	0.0375,	-0.2063,	-0.3238,	-0.2032,	0.0980,
411	0.3907,	0.4842,	0.3188,	0.0068,	-0.2456,
412	-0.2825,	-0.1048,	0.1336,	0.2374,	0.1113,
413	-0.1703,	-0.4141,	-0.4431,	-0.2222,	0.1155,
414	0.3594,	0.3667,	0.1591,	-0.0959,	-0.2050,
415	-0.0878,	0.1670,	0.3640,	0.3415,	0.0876,
416	-0.2477,	-0.4547,	-0.4082,	-0.1534,	0.1276,
417	0.2444,	0.1315,	-0.1079,	-0.2771,	-0.2282,

```
418    0.0302,    0.3359,    0.4851,    0.3741,    0.0724,
419   -0.2250,   -0.3332,   -0.2043,    0.0425,    0.2079,
420    0.1565,   -0.0858,   -0.3487,   -0.4372,   -0.2706,
421    0.0590,
422  第 1 點
423    0.0000,   -0.2299,   -0.3547,   -0.3364,   -0.2245,
424   -0.1167,   -0.0877,   -0.1369,   -0.1913,   -0.1615,
425   -0.0113,    0.2098,    0.3948,    0.4482,    0.3490,
426    0.1636,   -0.0006,   -0.0682,   -0.0435,   -0.0014,
427   -0.0274,   -0.1506,   -0.3170,   -0.4239,   -0.3902,
428   -0.2143,    0.0217,    0.2046,    0.2632,    0.2115,
429    0.1318,    0.1112,    0.1764,    0.2733,    0.3063,
430    0.2087,   -0.0045,   -0.2410,   -0.3886,   -0.3880,
431   -0.2684,   -0.1240,   -0.0461,   -0.0600,   -0.1111,
432   -0.1088,    0.0031,    0.1994,    0.3848,    0.4557,
433    0.3697,    0.1746,   -0.0236,   -0.1315,   -0.1286,
434   -0.0746,   -0.0601,   -0.1369,   -0.2756,   -0.3838,
435   -0.3704,   -0.2113,    0.0289,    0.2372,    0.3242,
436    0.2805,    0.1765,    0.1082,    0.1266,    0.2015,
437    0.2450,    0.1774,   -0.0101,   -0.2426,   -0.4071,
438   -0.4256,   -0.3058,   -0.1325,   -0.0084,    0.0162,
439   -0.0260,
440
441  速度序列 :
442
443  第 0 點
444    1.0000,    0.5898,   -0.3447,   -1.1247,   -1.1693,
445   -0.4085,    0.6628,    1.3280,    1.1492,    0.2715,
446   -0.6814,   -1.0471,   -0.5903,    0.3349,    1.0376,
447    0.9823,    0.1705,   -0.8555,   -1.3908,   -1.0623,
448   -0.0910,    0.8625,    1.1602,    0.6320,   -0.3095,
449   -0.9645,   -0.8435,   -0.0154,    0.9387,    1.3350,
450    0.8696,   -0.1642,   -1.0783,   -1.2693,   -0.6386,
451    0.3426,    0.9685,    0.7977,   -0.0360,   -0.9193,
452   -1.1948,   -0.6283,    0.4215,    1.2503,    1.3002,
453    0.5491,   -0.4749,   -1.0658,   -0.8347,    0.0194,
454    0.8546,    1.0428,    0.4172,   -0.6060,   -1.3179,
455   -1.2143,   -0.3516,    0.6911,    1.2163,    0.8949,
456   -0.0074,   -0.8218,   -0.9516,   -0.2954,    0.6804,
457    1.2704,    1.0294,    0.0896,   -0.9279,   -1.3455,
458   -0.9014,    0.0699,    0.8758,    0.9549,    0.2709,
459   -0.6637,   -1.1524,   -0.8102,    0.1602,    1.1069,
460    1.3833,
461  第 1 點
462   -1.0000,   -0.7640,   -0.2078,    0.3182,    0.5067,
463    0.3021,   -0.0698,   -0.2711,   -0.0989,    0.3638,
464    0.8024,    0.8903,    0.5215,   -0.1095,   -0.6364,
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465    -0.7697,    -0.4903,    -0.0538,    0.1970,    0.0776,
466    -0.3072,    -0.6394,    -0.6180,    -0.1789,    0.4498,
467     0.8988,     0.9083,     0.5040,    -0.0247,    -0.3294,
468    -0.2452,     0.0998,     0.3827,     0.3235,    -0.1081,
469    -0.6621,    -0.9777,    -0.8340,    -0.3049,     0.2889,
470     0.5999,     0.4896,     0.1160,    -0.1876,    -0.1558,
471     0.2153,     0.6623,     0.8401,     0.5690,    -0.0324,
472    -0.6215,    -0.8631,    -0.6556,    -0.1939,     0.1735,
473     0.1933,    -0.1153,    -0.4779,    -0.5654,    -0.2348,
474     0.3599,     0.8665,     0.9745,     0.6278,     0.0620,
475    -0.3608,    -0.4019,    -0.1077,     0.2332,     0.3027,
476    -0.0129,    -0.5347,    -0.9120,    -0.8673,    -0.3928,
477     0.2389,     0.6591,     0.6536,     0.3032,    -0.0827,
478    -0.1917,
479
480    加速度序列 :
481
482    第 0 點
483     0.0000,    -3.0687,    -3.9192,    -1.9029,     1.5969,
484     4.1343,     3.9210,     1.0861,    -2.4121,    -4.1609,
485    -2.9860,     0.2289,     3.1710,     3.7333,     1.5032,
486    -1.9451,    -4.1600,    -3.5413,    -0.4728,     2.9419,
487     4.3538,     2.8158,    -0.5561,    -3.3725,    -3.6558,
488    -1.2319,     2.1505,     4.0561,     3.0853,    -0.1336,
489    -3.3793,    -4.3970,    -2.4821,     1.0249,     3.6816,
490     3.6602,     1.0296,    -2.2997,    -3.9284,    -2.6651,
491     0.6295,     3.6450,     4.2471,     1.9824,    -1.5990,
492    -4.0295,    -3.6550,    -0.7929,     2.4980,     3.8732,
493     2.3565,    -0.9711,    -3.7347,    -3.9416,    -1.3907,
494     2.1790,     4.3063,     3.5342,     0.4314,    -2.8116,
495    -3.9259,    -2.1600,     1.1948,     3.7197,     3.5791,
496     0.8202,    -2.6536,    -4.4185,    -3.2344,     0.0819,
497     3.2301,     4.0419,     2.0021,    -1.3956,    -3.7076,
498    -3.2676,    -0.3649,     2.9567,     4.3385,     2.7702,
499    -0.6938,
500    第 1 點
501     0.0000,     1.7791,     2.4190,     1.5685,    -0.1000,
502    -1.3737,    -1.3579,    -0.1058,     1.4239,     2.0519,
503     1.2216,    -0.5952,    -2.2160,    -2.5690,    -1.4389,
504     0.3854,     1.6655,     1.5801,     0.2934,    -1.1734,
505    -1.6757,    -0.7650,     0.9831,     2.3663,     2.3987,
506     1.0070,    -0.9124,    -2.1135,    -1.8658,    -0.4542,
507     1.0354,     1.4918,     0.5694,    -1.0660,    -2.2077,
508    -1.9650,    -0.4011,     1.4982,     2.5041,     1.9971,
509     0.3923,    -1.1604,    -1.5883,    -0.6490,     0.9063,
510     1.8729,     1.4546,    -0.1614,    -1.9228,    -2.6430,
511    -1.8299,    -0.0306,     1.5504,     1.8923,     0.8650,
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512     -0.6926,    -1.5782,    -1.0852,    0.4888,    2.0458,  
513     2.4592,     1.3712,    -0.5473,    -2.0571,    -2.2097,  
514     -1.0012,     0.6379,     1.5077,     0.9899,    -0.5164,  
515     -1.8799,    -2.0425,    -0.7765,     1.1406,     2.4601,  
516     2.3286,     0.8798,    -0.8647,    -1.7152,    -1.1469,  
517     0.3399,  
518 */
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