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1 // J. L. Humar, "Dynamics of Structures", 第502-504頁
2 // 與 ConsoleApp_6J 相同，僅多出一個合並點，第2點是合併第0點和第1點。
3
4 using System;
5 using Matrix_0;
6
7 namespace ConsoleApp6R
8 {
9     internal class Program
10     {
11         static void Main(string[] args)
12         {
13
14             double[,] M = { { 2, 0 }, { 0, 1 } };
15             double[,] K = { { 3, -1 }, { -1, 1 } };
16             double[,] C = { { 0.4, -0.05 }, { -0.05, 0.2 } };
17             // t=0時，第0點和第1點，速度和位移之初始值。
18             double[,] y0Start = { { 0 }, { 0 }, { 1 }, { 2 } };
19
20             ReMatrix y0 = new ReMatrix(y0Start);
21             MKCMatrix MKC = new MKCMatrix(M, K, C);
22             ReMatrix A = new ReMatrix(MKC.Matrix);
23
24             EIG eig = new EIG(A);
25             CxMatrix D = eig.CxMatrixD;
26             CxMatrix V = eig.CxVector;
27             CxMatrix Q = eig.CxMatrixQ;
28
29             CxToHexp Hexp = new CxToHexp(D, Q, 0);
30             CxMatrix MatTemp = Hexp.GetCxMatrix;
31             CxMatrix d = ~MatTemp * y0;
32
33             // 列印系統與狀態參數。
34             Console.WriteLine("\n****{0,5}系{0,5}統{0,5}與{0,5}狀{0,5}態{0,5}參{0,5}數{0,5}****\n", "");
35
36             Console.WriteLine("\n***{0,5}特徵值V{0,5}***\n\n{1}\n", "", new PR(V));
37             Console.WriteLine("\n***{0,5}特徵向量矩陣Q{0,5}***\n\n{1}\n", "", new PR(Q));
38             Console.WriteLine("\n***{0,5}係數向量d{0,5}***\n\n{1}\n", "", new PR(d));
39
40             double step = 0.5;
41             int iRow = (int)(50 / step + 1);
42             int iCol = M.GetLength(1) + 2;
43             ReMatrix Disp = new ReMatrix(iRow, iCol);
```

```
44 ReMatrix Vel = new ReMatrix(iRow, iCol);
45 ReMatrix Acc = new ReMatrix(iRow, iCol);
46
47 for (int i = 0; i != iRow; i++)
48 {
49     double t = step * i;
50
51     Hexp = new CxToHexp(D, Q, t);
52     MatTemp = Hexp.GetCxMatrix;
53     ReMatrix y = (ReMatrix) (MatTemp * d);
54     ReMatrix yDot = A * y;
55
56     Acc.Matrix[i, 0] = t;
57     Acc.Matrix[i, 1] = yDot.Matrix[0, 0];
58     Acc.Matrix[i, 2] = yDot.Matrix[1, 0];
59     Acc.Matrix[i, 3] = Acc.Matrix[i, 1] + Acc.Matrix[i, 2];
60
61     Vel.Matrix[i, 0] = t;
62     Vel.Matrix[i, 1] = y.Matrix[0, 0];
63     Vel.Matrix[i, 2] = y.Matrix[1, 0];
64     Vel.Matrix[i, 3] = Vel.Matrix[i, 1] + Vel.Matrix[i, 2];
65
66     Disp.Matrix[i, 0] = t;
67     Disp.Matrix[i, 1] = y.Matrix[2, 0];
68     Disp.Matrix[i, 2] = y.Matrix[3, 0];
69     Disp.Matrix[i, 3] = Disp.Matrix[i, 1] + Disp.Matrix[i, 2];
70 }
71
72 // 列印標題。
73 Console.Write("\n***{0, 10} 狀{0, 5} 態{0, 5} 響{0, 5} 應{0, 10}***\n",
74     "");
75
76 // 列印空間節點之狀態響應(變位, 速度, 和加速)。
77 Console.Write("\n{0, 5}***位移反應量***{0, 5}\n{0, 8}時間(秒)" +
78     "{0, 8} 第0點位移{0, 8} 第1點位移\n\n{1}", "", new PR(Disp));
79 Console.Write("\n{0, 5}***速度反應量***{0, 5}\n{0, 8}時間(秒)" +
80     "{0, 8} 第0點速度{0, 8} 第1點速度\n\n{1}", "", new PR(Vel));
81 Console.Write("\n***{0, 5} 加速度反應量{0, 5}***\n{0, 8}時間(秒)" +
82     "{0, 8} 第0點加速度{0, 7} 第1點加速度\n\n{1}", "", new PR(Acc));
83
84 // 列印時間、節點變位、速度、和加速度等序列。
85 Console.Write("\n時間序列\n{0}\n", new PR4(Disp, 0));
86 Console.Write("\n第0點變位序列\n{0}\n", new PR4(Disp, 1));
87 Console.Write("\n第1點變位序列\n{0}\n", new PR4(Disp, 2));
88 Console.Write("\n點合併變位序列\n{0}\n", new PR4(Disp, 3));
89
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90 Console.Write("\n第0點速度序列\n{0}\n", new PR4(Vel, 1));
91 Console.Write("\n第1點速度序列\n{0}\n", new PR4(Vel, 2));
92 Console.Write("\n點合併變位序列\n{0}\n", new PR4(Vel, 3));
93
94 Console.Write("\n第0點加速度序列\n{0}\n", new PR4(Acc, 1));
95 Console.Write("\n第1點加速度序列\n{0}\n", new PR4(Acc, 2));
96 Console.Write("\n點合併變位序列\n{0}\n", new PR4(Acc, 3));
97
98 Console.Write("\n\n");
99
100     }
101 }
102 }
103
104 /* 執行結果如下 :
105 ****      系      統      與      狀      態      參      數      ****
106
107 ***      特徵值V      ***
108      -0.11666  +      1.40933i
109      -0.11666  -      1.40933i
110      -0.08334  +      0.70221i
111      -0.08334  -      0.70221i
112
113 ***      特徵向量矩陣Q      ***
114      0.57745 + 0.00000i, 0.57745 + 0.00000i, 0.25800 +
115      0.00000i,
116      0.25800 + 0.00000i
117      -0.57707 - 0.01365i, -0.57707 + 0.01365i, 0.51648 -
118      0.00609i,
119      0.51648 + 0.00609i
120      -0.03369 - 0.40695i, -0.03369 + 0.40695i, -0.04300 -
121      0.36231i,
122      -0.04300 + 0.36231i
123      0.02405 + 0.40748i, 0.02405 - 0.40748i, -0.09463 -
124      0.72428i,
125      -0.09463 + 0.72428i
126 ***      係數向量d      ***
127      0.00484  +      0.00006i
128      0.00484  -      0.00006i
129      -0.01084  +      1.37914i
130      -0.01084  -      1.37914i
131
132 ****      狀      態      響      應      ****

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133
134     ***位移反應量***
135     時間(秒)      第0點位移      第1點位移
136     0.00000      1.00000      2.00000      3.00000
137     0.50000      0.93967      1.87981      2.81948
138     1.00000      0.77181      1.54694      2.31875
139     1.50000      0.52458      1.05825      1.58283
140     2.00000      0.23388      0.48398      0.71785
141     2.50000      -0.06169     -0.10150     -0.16319
142     3.00000      -0.32593     -0.62850     -0.95443
143     3.50000      -0.52952     -1.03960     -1.56912
144     4.00000      -0.65311     -1.29530     -1.94840
145     4.50000      -0.68877     -1.37729     -2.06606
146     5.00000      -0.63986     -1.28919     -1.92905
147     5.50000      -0.51942     -1.05458     -1.57401
148     6.00000      -0.34767     -0.71285     -1.06052
149     6.50000      -0.14893     -0.31328     -0.46221
150     7.00000      0.05142      0.09168      0.14310
151     7.50000      0.22989      0.45312      0.68301
152     8.00000      0.36732      0.73135      1.09867
153     8.50000      0.45067      0.90002      1.35069
154     9.00000      0.47413      0.94810      1.42223
155     9.50000      0.43939      0.87986      1.31925
156     10.00000     0.35495      0.71296      1.06792
157     10.50000     0.23471      0.47520      0.70992
158     11.00000     0.09592      0.20036      0.29627
159     11.50000     -0.04325     -0.07622     -0.11947
160     12.00000     -0.16599     -0.32181     -0.48780
161     12.50000     -0.25890     -0.50987     -0.76878
162     13.00000     -0.31336     -0.62267     -0.93603
163     13.50000     -0.32611     -0.65268     -0.97879
164     14.00000     -0.29918     -0.60277     -0.90195
165     14.50000     -0.23909     -0.48509     -0.72418
166     15.00000     -0.15568     -0.31900     -0.47467
167     15.50000     -0.06063     -0.12814     -0.18878
168     16.00000      0.03398      0.06269      0.09666
169     16.50000      0.11710      0.23071      0.34780
170     17.00000      0.17986      0.35772      0.53757
171     17.50000      0.21642      0.43194      0.64836
172     18.00000      0.22445      0.44888      0.67333
173     18.50000      0.20516      0.41122      0.61639
174     19.00000      0.16294      0.32789      0.49083
175     19.50000      0.10460      0.21245      0.31706
176     20.00000      0.03842      0.08112      0.11954
177     20.50000     -0.02705     -0.04933     -0.07638
178     21.00000     -0.08400     -0.16356     -0.24757
179     21.50000     -0.12632     -0.24936     -0.37568
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180	22.00000	-0.15015	-0.29880	-0.44895
181	22.50000	-0.15422	-0.30886	-0.46307
182	23.00000	-0.13968	-0.28142	-0.42110
183	23.50000	-0.10980	-0.22269	-0.33249
184	24.00000	-0.06937	-0.14214	-0.21151
185	24.50000	-0.02398	-0.05110	-0.07509
186	25.00000	0.02061	0.03872	0.05933
187	25.50000	0.05924	0.11672	0.17596
188	26.00000	0.08782	0.17456	0.26237
189	26.50000	0.10374	0.20699	0.31073
190	27.00000	0.10610	0.21225	0.31835
191	27.50000	0.09565	0.19191	0.28756
192	28.00000	0.07464	0.15047	0.22511
193	28.50000	0.04640	0.09452	0.14093
194	29.00000	0.01488	0.03187	0.04675
195	29.50000	-0.01588	-0.02957	-0.04545
196	30.00000	-0.04228	-0.08260	-0.12488
197	30.50000	-0.06150	-0.12164	-0.18314
198	31.00000	-0.07185	-0.14314	-0.21500
199	31.50000	-0.07284	-0.14595	-0.21879
200	32.00000	-0.06511	-0.13119	-0.19631
201	32.50000	-0.05031	-0.10201	-0.15232
202	33.00000	-0.03074	-0.06303	-0.09377
203	33.50000	-0.00911	-0.01966	-0.02877
204	34.00000	0.01188	0.02256	0.03444
205	34.50000	0.02980	0.05872	0.08852
206	35.00000	0.04277	0.08499	0.12776
207	35.50000	0.04964	0.09905	0.14869
208	36.00000	0.05008	0.10023	0.15031
209	36.50000	0.04453	0.08942	0.13395
210	37.00000	0.03412	0.06888	0.10301
211	37.50000	0.02048	0.04183	0.06231
212	38.00000	0.00548	0.01198	0.01746
213	38.50000	-0.00896	-0.01691	-0.02587
214	39.00000	-0.02117	-0.04149	-0.06266
215	39.50000	-0.02988	-0.05919	-0.08907
216	40.00000	-0.03434	-0.06847	-0.10280
217	40.50000	-0.03436	-0.06887	-0.10323
218	41.00000	-0.03031	-0.06107	-0.09137
219	41.50000	-0.02299	-0.04663	-0.06961
220	42.00000	-0.01354	-0.02779	-0.04133
221	42.50000	-0.00324	-0.00716	-0.01041
222	43.00000	0.00662	0.01266	0.01928
223	43.50000	0.01491	0.02940	0.04431
224	44.00000	0.02078	0.04129	0.06207
225	44.50000	0.02372	0.04733	0.07105
226	45.00000	0.02361	0.04727	0.07087

227	45.50000	0.02070	0.04160	0.06230
228	46.00000	0.01556	0.03146	0.04702
229	46.50000	0.00898	0.01840	0.02738
230	47.00000	0.00186	0.00420	0.00606
231	47.50000	-0.00491	-0.00936	-0.01428
232	48.00000	-0.01056	-0.02073	-0.03129
233	48.50000	-0.01449	-0.02874	-0.04323
234	49.00000	-0.01639	-0.03270	-0.04908
235	49.50000	-0.01619	-0.03246	-0.04864
236	50.00000	-0.01408	-0.02838	-0.04246
237				
238	***速度反應量***			
239	時間(秒)	第0點速度	第1點速度	
240	0.00000	0.00000	0.00000	0.00000
241	0.50000	-0.23583	-0.46888	-0.70471
242	1.00000	-0.42608	-0.84336	-1.26945
243	1.50000	-0.55070	-1.08768	-1.63838
244	2.00000	-0.59906	-1.18431	-1.78337
245	2.50000	-0.57099	-1.13411	-1.70509
246	3.00000	-0.47610	-0.95456	-1.43066
247	3.50000	-0.33176	-0.67657	-1.00832
248	4.00000	-0.15994	-0.34010	-0.50004
249	4.50000	0.01612	0.01084	0.02697
250	5.00000	0.17508	0.33355	0.50863
251	5.50000	0.29982	0.59156	0.89138
252	6.00000	0.37898	0.75872	1.13770
253	6.50000	0.40741	0.82185	1.22926
254	7.00000	0.38608	0.78150	1.16758
255	7.50000	0.32137	0.65088	0.97225
256	8.00000	0.22395	0.45320	0.67715
257	8.50000	0.10749	0.21780	0.32529
258	9.00000	-0.01304	-0.02400	-0.03704
259	9.50000	-0.12303	-0.24297	-0.36600
260	10.00000	-0.21002	-0.41521	-0.62523
261	10.50000	-0.26511	-0.52442	-0.78953
262	11.00000	-0.28395	-0.56304	-0.84698
263	11.50000	-0.26705	-0.53225	-0.79930
264	12.00000	-0.21939	-0.44117	-0.66056
265	12.50000	-0.14936	-0.30512	-0.45448
266	13.00000	-0.06738	-0.14355	-0.21093
267	13.50000	0.01567	0.02252	0.03818
268	14.00000	0.08983	0.17301	0.26285
269	14.50000	0.14719	0.29115	0.43834
270	15.00000	0.18252	0.36524	0.54776
271	15.50000	0.19360	0.38981	0.58340
272	16.00000	0.18112	0.36583	0.54695
273	16.50000	0.14837	0.30011	0.44849

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274	17.00000	0.10070	0.20397	0.30468
275	17.50000	0.04477	0.09143	0.13620
276	18.00000	-0.01223	-0.02274	-0.03497
277	18.50000	-0.06344	-0.12486	-0.18830
278	19.00000	-0.10315	-0.20388	-0.30702
279	19.50000	-0.12740	-0.25241	-0.37982
280	20.00000	-0.13445	-0.26726	-0.40171
281	20.50000	-0.12479	-0.24937	-0.37416
282	21.00000	-0.10095	-0.20345	-0.30441
283	21.50000	-0.06701	-0.13708	-0.20409
284	22.00000	-0.02791	-0.05966	-0.08757
285	22.50000	0.01124	0.01879	0.03003
286	23.00000	0.04580	0.08886	0.13466
287	23.50000	0.07210	0.14284	0.21494
288	24.00000	0.08776	0.17553	0.26328
289	24.50000	0.09184	0.18467	0.27650
290	25.00000	0.08480	0.17105	0.25585
291	25.50000	0.06834	0.13814	0.20648
292	26.00000	0.04509	0.09146	0.13655
293	26.50000	0.01830	0.03771	0.05600
294	27.00000	-0.00861	-0.01614	-0.02475
295	27.50000	-0.03241	-0.06369	-0.09610
296	28.00000	-0.05050	-0.09985	-0.15035
297	28.50000	-0.06113	-0.12129	-0.18241
298	29.00000	-0.06359	-0.12667	-0.19026
299	29.50000	-0.05825	-0.11665	-0.17490
300	30.00000	-0.04638	-0.09362	-0.14000
301	30.50000	-0.02995	-0.06133	-0.09127
302	31.00000	-0.01131	-0.02430	-0.03561
303	31.50000	0.00714	0.01269	0.01983
304	32.00000	0.02321	0.04527	0.06848
305	32.50000	0.03523	0.06988	0.10512
306	33.00000	0.04212	0.08422	0.12634
307	33.50000	0.04350	0.08738	0.13087
308	34.00000	0.03963	0.07987	0.11951
309	34.50000	0.03140	0.06346	0.09486
310	35.00000	0.02010	0.04084	0.06093
311	35.50000	0.00729	0.01519	0.02248
312	36.00000	-0.00538	-0.01018	-0.01556
313	36.50000	-0.01643	-0.03228	-0.04872
314	37.00000	-0.02466	-0.04878	-0.07344
315	37.50000	-0.02929	-0.05818	-0.08747
316	38.00000	-0.03005	-0.05995	-0.08999
317	38.50000	-0.02716	-0.05447	-0.08163
318	39.00000	-0.02127	-0.04299	-0.06425
319	39.50000	-0.01332	-0.02731	-0.04063
320	40.00000	-0.00444	-0.00964	-0.01408

321	40.50000	0.00424	0.00779	0.01202
322	41.00000	0.01170	0.02291	0.03461
323	41.50000	0.01718	0.03410	0.05128
324	42.00000	0.02019	0.04035	0.06053
325	42.50000	0.02057	0.04129	0.06186
326	43.00000	0.01849	0.03725	0.05574
327	43.50000	0.01439	0.02910	0.04349
328	44.00000	0.00891	0.01815	0.02706
329	44.50000	0.00280	0.00593	0.00873
330	45.00000	-0.00316	-0.00601	-0.00917
331	45.50000	-0.00828	-0.01627	-0.02455
332	46.00000	-0.01201	-0.02378	-0.03579
333	46.50000	-0.01401	-0.02787	-0.04188
334	47.00000	-0.01418	-0.02833	-0.04251
335	47.50000	-0.01265	-0.02540	-0.03804
336	48.00000	-0.00973	-0.01969	-0.02942
337	48.50000	-0.00589	-0.01210	-0.01800
338	49.00000	-0.00167	-0.00368	-0.00535
339	49.50000	0.00241	0.00452	0.00692
340	50.00000	0.00587	0.01152	0.01739
341				
342	*** 加速度反應量	***		
343	時間(秒)	第0點加速度	第1點加速度	
344	0.00000	-0.50000	-1.00000	-1.50000
345	0.50000	-0.43415	-0.85816	-1.29231
346	1.00000	-0.32011	-0.62777	-0.94787
347	1.50000	-0.17479	-0.34367	-0.51846
348	2.00000	-0.01862	-0.04319	-0.06181
349	2.50000	0.12763	0.23808	0.36571
350	3.00000	0.24601	0.46967	0.71568
351	3.50000	0.32393	0.62880	0.95273
352	4.00000	0.35550	0.70221	1.05771
353	4.50000	0.34155	0.68716	1.02871
354	5.00000	0.28851	0.59138	0.87989
355	5.50000	0.20667	0.43184	0.63851
356	6.00000	0.10825	0.23239	0.34063
357	6.50000	0.00582	0.02035	0.02617
358	7.00000	-0.08897	-0.17726	-0.26623
359	7.50000	-0.16629	-0.33733	-0.50362
360	8.00000	-0.21877	-0.44347	-0.66224
361	8.50000	-0.24204	-0.48754	-0.72958
362	9.00000	-0.23514	-0.46982	-0.70496
363	9.50000	-0.20063	-0.39802	-0.59865
364	10.00000	-0.14433	-0.28547	-0.42979
365	10.50000	-0.07456	-0.14886	-0.22342
366	11.00000	-0.00098	-0.00603	-0.00701
367	11.50000	0.06687	0.12607	0.19294



368	12.00000	0.12093	0.23309	0.35401
369	12.50000	0.15566	0.30453	0.46019
370	13.00000	0.16859	0.33466	0.50324
371	13.50000	0.16025	0.32285	0.48311
372	14.00000	0.13375	0.27348	0.40722
373	14.50000	0.09393	0.19513	0.28906
374	15.00000	0.04665	0.09940	0.14604
375	15.50000	-0.00210	-0.00077	-0.00287
376	16.00000	-0.04670	-0.09282	-0.13952
377	16.50000	-0.08247	-0.16621	-0.24868
378	17.00000	-0.10597	-0.21362	-0.31959
379	17.50000	-0.11533	-0.23157	-0.34690
380	18.00000	-0.11036	-0.22049	-0.33085
381	18.50000	-0.09256	-0.18426	-0.27683
382	19.00000	-0.06493	-0.12934	-0.19427
383	19.50000	-0.03151	-0.06374	-0.09524
384	20.00000	0.00315	0.00402	0.00717
385	20.50000	0.03464	0.06591	0.10055
386	21.00000	0.05933	0.11521	0.17453
387	21.50000	0.07477	0.14711	0.22188
388	22.00000	0.07992	0.15918	0.23910
389	22.50000	0.07512	0.15144	0.22656
390	23.00000	0.06188	0.12625	0.18813
391	23.50000	0.04251	0.08792	0.13043
392	24.00000	0.01982	0.04206	0.06187
393	24.50000	-0.00333	-0.00522	-0.00855
394	25.00000	-0.02424	-0.04808	-0.07232
395	25.50000	-0.04072	-0.08169	-0.12240
396	26.00000	-0.05118	-0.10278	-0.15396
397	26.50000	-0.05483	-0.10988	-0.16471
398	27.00000	-0.05171	-0.10335	-0.15506
399	27.50000	-0.04264	-0.08514	-0.12777
400	28.00000	-0.02913	-0.05838	-0.08751
401	28.50000	-0.01315	-0.02692	-0.04007
402	29.00000	0.00316	0.00517	0.00833
403	29.50000	0.01778	0.03410	0.05188
404	30.00000	0.02905	0.05673	0.08578
405	30.50000	0.03589	0.07091	0.10679
406	31.00000	0.03786	0.07559	0.11345
407	31.50000	0.03517	0.07093	0.10610
408	32.00000	0.02856	0.05818	0.08675
409	32.50000	0.01915	0.03949	0.05864
410	33.00000	0.00828	0.01755	0.02583
411	33.50000	-0.00269	-0.00474	-0.00743
412	34.00000	-0.01247	-0.02468	-0.03714
413	34.50000	-0.02003	-0.04005	-0.06007
414	35.00000	-0.02465	-0.04938	-0.07404

415	35.50000	-0.02602	-0.05208	-0.07810
416	36.00000	-0.02418	-0.04838	-0.07257
417	36.50000	-0.01961	-0.03926	-0.05886
418	37.00000	-0.01303	-0.02624	-0.03927
419	37.50000	-0.00540	-0.01118	-0.01658
420	38.00000	0.00228	0.00399	0.00627
421	38.50000	0.00906	0.01748	0.02654
422	39.00000	0.01419	0.02785	0.04204
423	39.50000	0.01721	0.03411	0.05132
424	40.00000	0.01792	0.03583	0.05376
425	40.50000	0.01645	0.03317	0.04962
426	41.00000	0.01316	0.02677	0.03992
427	41.50000	0.00859	0.01767	0.02626
428	42.00000	0.00338	0.00719	0.01058
429	42.50000	-0.00180	-0.00331	-0.00511
430	43.00000	-0.00636	-0.01257	-0.01893
431	43.50000	-0.00982	-0.01959	-0.02940
432	44.00000	-0.01185	-0.02370	-0.03555
433	44.50000	-0.01232	-0.02466	-0.03698
434	45.00000	-0.01129	-0.02262	-0.03391
435	45.50000	-0.00900	-0.01806	-0.02706
436	46.00000	-0.00580	-0.01174	-0.01755
437	46.50000	-0.00217	-0.00454	-0.00671
438	47.00000	0.00144	0.00262	0.00406
439	47.50000	0.00458	0.00890	0.01348
440	48.00000	0.00692	0.01363	0.02055
441	48.50000	0.00824	0.01637	0.02462
442	49.00000	0.00847	0.01696	0.02544
443	49.50000	0.00768	0.01549	0.02317
444	50.00000	0.00605	0.01229	0.01833

445				
446	時間序列			
447	0.0000,	0.5000,	1.0000,	1.5000, ㄅ
	2.0000,			
448	2.5000,	3.0000,	3.5000,	4.0000, ㄅ
	4.5000,			
449	5.0000,	5.5000,	6.0000,	6.5000, ㄅ
	7.0000,			
450	7.5000,	8.0000,	8.5000,	9.0000, ㄅ
	9.5000,			
451	10.0000,	10.5000,	11.0000,	11.5000, ㄅ
	12.0000,			
452	12.5000,	13.0000,	13.5000,	14.0000, ㄅ
	14.5000,			
453	15.0000,	15.5000,	16.0000,	16.5000, ㄅ
	17.0000,			
454	17.5000,	18.0000,	18.5000,	19.0000, ㄅ

	19.5000,				
455	20.0000,	20.5000,	21.0000,	21.5000,	↻
	22.0000,				
456	22.5000,	23.0000,	23.5000,	24.0000,	↻
	24.5000,				
457	25.0000,	25.5000,	26.0000,	26.5000,	↻
	27.0000,				
458	27.5000,	28.0000,	28.5000,	29.0000,	↻
	29.5000,				
459	30.0000,	30.5000,	31.0000,	31.5000,	↻
	32.0000,				
460	32.5000,	33.0000,	33.5000,	34.0000,	↻
	34.5000,				
461	35.0000,	35.5000,	36.0000,	36.5000,	↻
	37.0000,				
462	37.5000,	38.0000,	38.5000,	39.0000,	↻
	39.5000,				
463	40.0000,	40.5000,	41.0000,	41.5000,	↻
	42.0000,				
464	42.5000,	43.0000,	43.5000,	44.0000,	↻
	44.5000,				
465	45.0000,	45.5000,	46.0000,	46.5000,	↻
	47.0000,				
466	47.5000,	48.0000,	48.5000,	49.0000,	↻
	49.5000,				
467	50.0000,				
468					
469	第0點變位序列				
470	1.0000,	0.9397,	0.7718,	0.5246,	↻
	0.2339,				
471	-0.0617,	-0.3259,	-0.5295,	-0.6531,	↻
	-0.6888,				
472	-0.6399,	-0.5194,	-0.3477,	-0.1489,	↻
	0.0514,				
473	0.2299,	0.3673,	0.4507,	0.4741,	↻
	0.4394,				
474	0.3550,	0.2347,	0.0959,	-0.0433,	↻
	-0.1660,				
475	-0.2589,	-0.3134,	-0.3261,	-0.2992,	↻
	-0.2391,				
476	-0.1557,	-0.0606,	0.0340,	0.1171,	↻
	0.1799,				
477	0.2164,	0.2245,	0.2052,	0.1629,	↻
	0.1046,				
478	0.0384,	-0.0271,	-0.0840,	-0.1263,	↻
	-0.1502,				
479	-0.1542,	-0.1397,	-0.1098,	-0.0694,	↻

	-0.0240,				
480	0.0206,	0.0592,	0.0878,	0.1037,	↻
	0.1061,				
481	0.0957,	0.0746,	0.0464,	0.0149,	↻
	-0.0159,				
482	-0.0423,	-0.0615,	-0.0719,	-0.0728,	↻
	-0.0651,				
483	-0.0503,	-0.0307,	-0.0091,	0.0119,	↻
	0.0298,				
484	0.0428,	0.0496,	0.0501,	0.0445,	↻
	0.0341,				
485	0.0205,	0.0055,	-0.0090,	-0.0212,	↻
	-0.0299,				
486	-0.0343,	-0.0344,	-0.0303,	-0.0230,	↻
	-0.0135,				
487	-0.0032,	0.0066,	0.0149,	0.0208,	↻
	0.0237,				
488	0.0236,	0.0207,	0.0156,	0.0090,	↻
	0.0019,				
489	-0.0049,	-0.0106,	-0.0145,	-0.0164,	↻
	-0.0162,				
490	-0.0141,				
491					
492	第1點變位序列				
493	2.0000,	1.8798,	1.5469,	1.0582,	↻
	0.4840,				
494	-0.1015,	-0.6285,	-1.0396,	-1.2953,	↻
	-1.3773,				
495	-1.2892,	-1.0546,	-0.7129,	-0.3133,	↻
	0.0917,				
496	0.4531,	0.7314,	0.9000,	0.9481,	↻
	0.8799,				
497	0.7130,	0.4752,	0.2004,	-0.0762,	↻
	-0.3218,				
498	-0.5099,	-0.6227,	-0.6527,	-0.6028,	↻
	-0.4851,				
499	-0.3190,	-0.1281,	0.0627,	0.2307,	↻
	0.3577,				
500	0.4319,	0.4489,	0.4112,	0.3279,	↻
	0.2125,				
501	0.0811,	-0.0493,	-0.1636,	-0.2494,	↻
	-0.2988,				
502	-0.3089,	-0.2814,	-0.2227,	-0.1421,	↻
	-0.0511,				
503	0.0387,	0.1167,	0.1746,	0.2070,	↻
	0.2122,				
504	0.1919,	0.1505,	0.0945,	0.0319,	↻

	-0.0296,				
505	-0.0826,	-0.1216,	-0.1431,	-0.1459,	↗
	-0.1312,				
506	-0.1020,	-0.0630,	-0.0197,	0.0226,	↗
	0.0587,				
507	0.0850,	0.0991,	0.1002,	0.0894,	↗
	0.0689,				
508	0.0418,	0.0120,	-0.0169,	-0.0415,	↗
	-0.0592,				
509	-0.0685,	-0.0689,	-0.0611,	-0.0466,	↗
	-0.0278,				
510	-0.0072,	0.0127,	0.0294,	0.0413,	↗
	0.0473,				
511	0.0473,	0.0416,	0.0315,	0.0184,	↗
	0.0042,				
512	-0.0094,	-0.0207,	-0.0287,	-0.0327,	↗
	-0.0325,				
513	-0.0284,				
514					
515	點合併變位序列				
516	3.0000,	2.8195,	2.3187,	1.5828,	↗
	0.7179,				
517	-0.1632,	-0.9544,	-1.5691,	-1.9484,	↗
	-2.0661,				
518	-1.9291,	-1.5740,	-1.0605,	-0.4622,	↗
	0.1431,				
519	0.6830,	1.0987,	1.3507,	1.4222,	↗
	1.3193,				
520	1.0679,	0.7099,	0.2963,	-0.1195,	↗
	-0.4878,				
521	-0.7688,	-0.9360,	-0.9788,	-0.9019,	↗
	-0.7242,				
522	-0.4747,	-0.1888,	0.0967,	0.3478,	↗
	0.5376,				
523	0.6484,	0.6733,	0.6164,	0.4908,	↗
	0.3171,				
524	0.1195,	-0.0764,	-0.2476,	-0.3757,	↗
	-0.4490,				
525	-0.4631,	-0.4211,	-0.3325,	-0.2115,	↗
	-0.0751,				
526	0.0593,	0.1760,	0.2624,	0.3107,	↗
	0.3183,				
527	0.2876,	0.2251,	0.1409,	0.0467,	↗
	-0.0454,				
528	-0.1249,	-0.1831,	-0.2150,	-0.2188,	↗
	-0.1963,				
529	-0.1523,	-0.0938,	-0.0288,	0.0344,	↗

	0.0885,				
530	0.1278,	0.1487,	0.1503,	0.1340,	↻
	0.1030,				
531	0.0623,	0.0175,	-0.0259,	-0.0627,	↻
	-0.0891,				
532	-0.1028,	-0.1032,	-0.0914,	-0.0696,	↻
	-0.0413,				
533	-0.0104,	0.0193,	0.0443,	0.0621,	↻
	0.0710,				
534	0.0709,	0.0623,	0.0470,	0.0274,	↻
	0.0061,				
535	-0.0143,	-0.0313,	-0.0432,	-0.0491,	↻
	-0.0486,				
536	-0.0425,				
537					
538	第0點速度序列				
539	0.0000,	-0.2358,	-0.4261,	-0.5507,	↻
	-0.5991,				
540	-0.5710,	-0.4761,	-0.3318,	-0.1599,	↻
	0.0161,				
541	0.1751,	0.2998,	0.3790,	0.4074,	↻
	0.3861,				
542	0.3214,	0.2240,	0.1075,	-0.0130,	↻
	-0.1230,				
543	-0.2100,	-0.2651,	-0.2839,	-0.2671,	↻
	-0.2194,				
544	-0.1494,	-0.0674,	0.0157,	0.0898,	↻
	0.1472,				
545	0.1825,	0.1936,	0.1811,	0.1484,	↻
	0.1007,				
546	0.0448,	-0.0122,	-0.0634,	-0.1031,	↻
	-0.1274,				
547	-0.1344,	-0.1248,	-0.1010,	-0.0670,	↻
	-0.0279,				
548	0.0112,	0.0458,	0.0721,	0.0878,	↻
	0.0918,				
549	0.0848,	0.0683,	0.0451,	0.0183,	↻
	-0.0086,				
550	-0.0324,	-0.0505,	-0.0611,	-0.0636,	↻
	-0.0583,				
551	-0.0464,	-0.0299,	-0.0113,	0.0071,	↻
	0.0232,				
552	0.0352,	0.0421,	0.0435,	0.0396,	↻
	0.0314,				
553	0.0201,	0.0073,	-0.0054,	-0.0164,	↻
	-0.0247,				
554	-0.0293,	-0.0300,	-0.0272,	-0.0213,	↻

	-0.0133,				
555	-0.0044,	0.0042,	0.0117,	0.0172,	↻
	0.0202,				
556	0.0206,	0.0185,	0.0144,	0.0089,	↻
	0.0028,				
557	-0.0032,	-0.0083,	-0.0120,	-0.0140,	↻
	-0.0142,				
558	-0.0126,	-0.0097,	-0.0059,	-0.0017,	↻
	0.0024,				
559	0.0059,				
560					
561	第1點速度序列				
562	0.0000,	-0.4689,	-0.8434,	-1.0877,	↻
	-1.1843,				
563	-1.1341,	-0.9546,	-0.6766,	-0.3401,	↻
	0.0108,				
564	0.3336,	0.5916,	0.7587,	0.8218,	↻
	0.7815,				
565	0.6509,	0.4532,	0.2178,	-0.0240,	↻
	-0.2430,				
566	-0.4152,	-0.5244,	-0.5630,	-0.5323,	↻
	-0.4412,				
567	-0.3051,	-0.1436,	0.0225,	0.1730,	↻
	0.2911,				
568	0.3652,	0.3898,	0.3658,	0.3001,	↻
	0.2040,				
569	0.0914,	-0.0227,	-0.1249,	-0.2039,	↻
	-0.2524,				
570	-0.2673,	-0.2494,	-0.2035,	-0.1371,	↻
	-0.0597,				
571	0.0188,	0.0889,	0.1428,	0.1755,	↻
	0.1847,				
572	0.1710,	0.1381,	0.0915,	0.0377,	↻
	-0.0161,				
573	-0.0637,	-0.0999,	-0.1213,	-0.1267,	↻
	-0.1166,				
574	-0.0936,	-0.0613,	-0.0243,	0.0127,	↻
	0.0453,				
575	0.0699,	0.0842,	0.0874,	0.0799,	↻
	0.0635,				
576	0.0408,	0.0152,	-0.0102,	-0.0323,	↻
	-0.0488,				
577	-0.0582,	-0.0599,	-0.0545,	-0.0430,	↻
	-0.0273,				
578	-0.0096,	0.0078,	0.0229,	0.0341,	↻
	0.0403,				
579	0.0413,	0.0372,	0.0291,	0.0181,	↻

	0.0059,				
580	-0.0060,	-0.0163,	-0.0238,	-0.0279,	↻
	-0.0283,				
581	-0.0254,	-0.0197,	-0.0121,	-0.0037,	↻
	0.0045,				
582	0.0115,				
583					
584	點合併變位序列				
585	0.0000,	-0.7047,	-1.2694,	-1.6384,	↻
	-1.7834,				
586	-1.7051,	-1.4307,	-1.0083,	-0.5000,	↻
	0.0270,				
587	0.5086,	0.8914,	1.1377,	1.2293,	↻
	1.1676,				
588	0.9723,	0.6772,	0.3253,	-0.0370,	↻
	-0.3660,				
589	-0.6252,	-0.7895,	-0.8470,	-0.7993,	↻
	-0.6606,				
590	-0.4545,	-0.2109,	0.0382,	0.2628,	↻
	0.4383,				
591	0.5478,	0.5834,	0.5469,	0.4485,	↻
	0.3047,				
592	0.1362,	-0.0350,	-0.1883,	-0.3070,	↻
	-0.3798,				
593	-0.4017,	-0.3742,	-0.3044,	-0.2041,	↻
	-0.0876,				
594	0.0300,	0.1347,	0.2149,	0.2633,	↻
	0.2765,				
595	0.2558,	0.2065,	0.1365,	0.0560,	↻
	-0.0247,				
596	-0.0961,	-0.1504,	-0.1824,	-0.1903,	↻
	-0.1749,				
597	-0.1400,	-0.0913,	-0.0356,	0.0198,	↻
	0.0685,				
598	0.1051,	0.1263,	0.1309,	0.1195,	↻
	0.0949,				
599	0.0609,	0.0225,	-0.0156,	-0.0487,	↻
	-0.0734,				
600	-0.0875,	-0.0900,	-0.0816,	-0.0643,	↻
	-0.0406,				
601	-0.0141,	0.0120,	0.0346,	0.0513,	↻
	0.0605,				
602	0.0619,	0.0557,	0.0435,	0.0271,	↻
	0.0087,				
603	-0.0092,	-0.0245,	-0.0358,	-0.0419,	↻
	-0.0425,				
604	-0.0380,	-0.0294,	-0.0180,	-0.0053,	↻



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        0.0069,
605        0.0174,
606
607 第0點加速度序列
608        -0.5000,        -0.4341,        -0.3201,        -0.1748,        ↗
        -0.0186,
609        0.1276,        0.2460,        0.3239,        0.3555,        ↗
        0.3416,
610        0.2885,        0.2067,        0.1082,        0.0058,        ↗
        -0.0890,
611        -0.1663,        -0.2188,        -0.2420,        -0.2351,        ↗
        -0.2006,
612        -0.1443,        -0.0746,        -0.0010,        0.0669,        ↗
        0.1209,
613        0.1557,        0.1686,        0.1603,        0.1337,        ↗
        0.0939,
614        0.0466,        -0.0021,        -0.0467,        -0.0825,        ↗
        -0.1060,
615        -0.1153,        -0.1104,        -0.0926,        -0.0649,        ↗
        -0.0315,
616        0.0031,        0.0346,        0.0593,        0.0748,        ↗
        0.0799,
617        0.0751,        0.0619,        0.0425,        0.0198,        ↗
        -0.0033,
618        -0.0242,        -0.0407,        -0.0512,        -0.0548,        ↗
        -0.0517,
619        -0.0426,        -0.0291,        -0.0131,        0.0032,        ↗
        0.0178,
620        0.0290,        0.0359,        0.0379,        0.0352,        ↗
        0.0286,
621        0.0192,        0.0083,        -0.0027,        -0.0125,        ↗
        -0.0200,
622        -0.0247,        -0.0260,        -0.0242,        -0.0196,        ↗
        -0.0130,
623        -0.0054,        0.0023,        0.0091,        0.0142,        ↗
        0.0172,
624        0.0179,        0.0164,        0.0132,        0.0086,        ↗
        0.0034,
625        -0.0018,        -0.0064,        -0.0098,        -0.0118,        ↗
        -0.0123,
626        -0.0113,        -0.0090,        -0.0058,        -0.0022,        ↗
        0.0014,
627        0.0046,        0.0069,        0.0082,        0.0085,        ↗
        0.0077,
628        0.0060,
629
630 第1點加速度序列
```

631	-1.0000,	-0.8582,	-0.6278,	-0.3437,	↻
	-0.0432,				
632	0.2381,	0.4697,	0.6288,	0.7022,	↻
	0.6872,				
633	0.5914,	0.4318,	0.2324,	0.0203,	↻
	-0.1773,				
634	-0.3373,	-0.4435,	-0.4875,	-0.4698,	↻
	-0.3980,				
635	-0.2855,	-0.1489,	-0.0060,	0.1261,	↻
	0.2331,				
636	0.3045,	0.3347,	0.3229,	0.2735,	↻
	0.1951,				
637	0.0994,	-0.0008,	-0.0928,	-0.1662,	↻
	-0.2136,				
638	-0.2316,	-0.2205,	-0.1843,	-0.1293,	↻
	-0.0637,				
639	0.0040,	0.0659,	0.1152,	0.1471,	↻
	0.1592,				
640	0.1514,	0.1263,	0.0879,	0.0421,	↻
	-0.0052,				
641	-0.0481,	-0.0817,	-0.1028,	-0.1099,	↻
	-0.1034,				
642	-0.0851,	-0.0584,	-0.0269,	0.0052,	↻
	0.0341,				
643	0.0567,	0.0709,	0.0756,	0.0709,	↻
	0.0582,				
644	0.0395,	0.0176,	-0.0047,	-0.0247,	↻
	-0.0400,				
645	-0.0494,	-0.0521,	-0.0484,	-0.0393,	↻
	-0.0262,				
646	-0.0112,	0.0040,	0.0175,	0.0278,	↻
	0.0341,				
647	0.0358,	0.0332,	0.0268,	0.0177,	↻
	0.0072,				
648	-0.0033,	-0.0126,	-0.0196,	-0.0237,	↻
	-0.0247,				
649	-0.0226,	-0.0181,	-0.0117,	-0.0045,	↻
	0.0026,				
650	0.0089,	0.0136,	0.0164,	0.0170,	↻
	0.0155,				
651	0.0123,				
652					
653	點合併變位序列				
654	-1.5000,	-1.2923,	-0.9479,	-0.5185,	↻
	-0.0618,				
655	0.3657,	0.7157,	0.9527,	1.0577,	↻
	1.0287,				

656	0.8799,	0.6385,	0.3406,	0.0262,	↵
	-0.2662,				
657	-0.5036,	-0.6622,	-0.7296,	-0.7050,	↵
	-0.5986,				
658	-0.4298,	-0.2234,	-0.0070,	0.1929,	↵
	0.3540,				
659	0.4602,	0.5032,	0.4831,	0.4072,	↵
	0.2891,				
660	0.1460,	-0.0029,	-0.1395,	-0.2487,	↵
	-0.3196,				
661	-0.3469,	-0.3309,	-0.2768,	-0.1943,	↵
	-0.0952,				
662	0.0072,	0.1005,	0.1745,	0.2219,	↵
	0.2391,				
663	0.2266,	0.1881,	0.1304,	0.0619,	↵
	-0.0085,				
664	-0.0723,	-0.1224,	-0.1540,	-0.1647,	↵
	-0.1551,				
665	-0.1278,	-0.0875,	-0.0401,	0.0083,	↵
	0.0519,				
666	0.0858,	0.1068,	0.1134,	0.1061,	↵
	0.0867,				
667	0.0586,	0.0258,	-0.0074,	-0.0371,	↵
	-0.0601,				
668	-0.0740,	-0.0781,	-0.0726,	-0.0589,	↵
	-0.0393,				
669	-0.0166,	0.0063,	0.0265,	0.0420,	↵
	0.0513,				
670	0.0538,	0.0496,	0.0399,	0.0263,	↵
	0.0106,				
671	-0.0051,	-0.0189,	-0.0294,	-0.0355,	↵
	-0.0370,				
672	-0.0339,	-0.0271,	-0.0175,	-0.0067,	↵
	0.0041,				
673	0.0135,	0.0206,	0.0246,	0.0254,	↵
	0.0232,				
674	0.0183,				
675					
676	請按任意鍵繼續 . . .				
677	*/				
678					