

## Tournament Analysis

# Tournament Analysis

# Mean Scores and Coefficient of Variation

group	mean score										coefficient of variation									
	g1	g2	g3	g4	g5	g6	g7	g8	g9		g1	g2	g3	g4	g5	g6	g7	g8	g9	
dancers	friends	ratio																		
100	0%	9786	10206	4500	10230	10038	10245	10235	10127	10222	1%	0%	0%	0%	1%	0%	0%	1%	0%	
100	25%	9874	10248	4878	10256	10069	10247	10229	10123	10216	1%	0%	1%	0%	2%	0%	0%	1%	0%	
100	50%	9912	10262	5416	10246	10071	10250	10239	10199	10271	1%	0%	1%	0%	1%	0%	0%	0%	0%	
100	75%	9917	10246	6010	10272	10191	10281	10242	10210	10251	1%	0%	1%	0%	1%	0%	0%	1%	0%	
200	0%	8902	9636	5145	9669	9243	9678	8690	9311	9649	2%	0%	0%	1%	1%	1%	32%	1%	1%	
200	25%	8989	9671	5414	9691	8487	9698	9666	9359	9664	1%	0%	0%	1%	31%	0%	0%	1%	0%	
200	50%	8937	9708	5838	9677	8499	9735	8790	9446	9689	1%	1%	0%	1%	30%	0%	32%	1%	0%	
200	75%	9085	9696	6292	9728	8591	9780	9726	9457	9716	1%	1%	0%	0%	29%	0%	0%	1%	1%	
400	0%	6946	8497	5145	8467	7362	8601	8535	7896	8427	3%	1%	0%	1%	6%	1%	1%	2%	1%	
400	25%	7123	8476	5378	8519	6738	8578	8587	8069	8517	2%	1%	0%	1%	27%	1%	1%	3%	1%	
400	50%	7144	8571	5766	8613	7570	8616	8628	8071	8599	2%	1%	0%	1%	6%	1%	1%	2%	1%	
400	75%	7316	8621	6204	8676	6879	8699	8691	8115	8632	3%	1%	1%	1%	25%	1%	1%	2%	0%	
800	0%	5103	6114	5145	6178	5145	6350	5624	5022	6056	0%	1%	0%	2%	0%	2%	26%	5%	1%	
800	25%	5487	6200	5359	6272	5506	6407	5307	5298	6181	1%	1%	0%	3%	1%	1%	54%	5%	2%	
800	50%	5968	6365	5733	6360	5985	6424	4971	5325	6311	1%	2%	0%	2%	1%	2%	60%	5%	1%	
800	75%	4909	6427	6167	6460	6473	6617	6485	5590	6508	92%	2%	0%	1%	0%	1%	1%	4%	1%	
1600	0%	5103	4905	5145	5085	5145	5076	5130	2004	5130	0%	0%	0%	0%	0%	0%	0%	0%	0%	
1600	25%	5441	5114	5319	5313	5488	5310	5503	2072	5318	0%	0%	1%	1%	0%	0%	0%	1%	0%	
1600	50%	4470	5536	5677	5650	5976	5656	5998	2068	5685	98%	1%	1%	1%	1%	1%	1%	1%	0%	
1600	75%	3364	3065	6111	5988	6434	6023	6412	2084	6095	179%	95%	1%	1%	0%	1%	1%	1%	1%	
3200	0%	1224	2502	0	1554	1928	1319	2052	0	1328	0%	0%	0%	0%	1%	0%	0%	0%	0%	
3200	25%	1226	2538	0	1581	2108	1419	2092	0	1420	0%	0%	0%	1%	1%	0%	1%	1%	1%	
3200	50%	1297	2533	0	1677	2291	1528	2316	0	1527	1%	0%	0%	1%	1%	0%	1%	1%	1%	
3200	75%	1403	2534	0	1819	2480	1633	2620	0	1640	1%	0%	0%	1%	1%	0%	1%	1%	1%	
6400	0%	456	837	0	756	942	589	1023	0	584	0%	0%	0%	0%	0%	1%	0%	0%	0%	
6400	25%	456	916	0	757	988	637	1029	0	609	0%	1%	0%	1%	1%	0%	1%	1%	0%	
6400	50%	456	986	0	804	1051	686	1084	0	655	0%	0%	0%	1%	2%	0%	1%	1%	0%	
12800	25%	153	416	0	153	258	257	375	0	255	0%	0%	0%	0%	0%	0%	0%	0%	0%	
12800	50%	153	412	0	162	284	277	390	0	275	0%	0%	0%	0%	0%	0%	0%	0%	0%	
25600	0%	-880	0	0	-7944	84	60	78	0	60	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Figure 1: Mean Scores and Coefficient of Variation

# Big Variations for g2

- ▶ variation is generally pretty low (  $< 1\%$  )
- ▶ For g2, huge variation of 95% for (1600, 75%)

	dancers	friends	group	score
1791	1600	1200	g2	6024
1792	1600	1200	g2	141
1793	1600	1200	g2	5925
1794	1600	1200	g2	141
1795	1600	1200	g2	141
1796	1600	1200	g2	5967
1797	1600	1200	g2	141
1798	1600	1200	g2	141
1799	1600	1200	g2	6017
1800	1600	1200	g2	6016

# Big Variations for g2

- ▶ because of estimating friend density for our Medium Strategy
- ▶ dance with partners for longer duration
- ▶ competitive score of 5989.80 in half the scenarios
- ▶ meagre 141 for the rest
- ▶ 50% chance that the unluckiest dancer will not find friends
- ▶ Because of the uncertainty, better off just ignoring friends
- ▶ should try to ensure that every dancer dances

# Big Variations for g1 and g7

- ▶ also see a huge variation because of claustrophobia.
- ▶ Other high variations are due to single outliers (on the worse side) in data.

	dancers	friends	group	score
1360	800	200	g7	-3230
1437	800	400	g7	-2776
1468	800	600	g1	-8686
1702	1600	800	g1	-8688
1781	1600	1200	g1	-8687
1782	1600	1200	g1	-8686
2388	25600	0	g1	-880
2391	25600	0	g4	-7944

# Tournament categories

- ▶ Small

- ▶ for  $d \leq 800$
- ▶ It is possible to systematically find soulmates

- ▶ Medium

- ▶ for  $800 < d \leq 1600$
- ▶ It is possible for all dancers to dance at the same time on the dance floor

- ▶ Large

- ▶ for  $1600 < d$
- ▶ We require some sort of scheduling to ensure each of the dancer gets to dance
- ▶ none of the dancers should suffer claustrophobia

# Team wise Scores

group	score									Average if gt 0
	g2	g7	g6	g9	g5	g1	g4	g8	g3	
dancers										
100 dancers	10240	10236	10256	10240	10092	9872	10251	10165	5201	9617
200 dancers	9678	9218	9723	9679	8705	8978	9691	9393	5672	8971
400 dancers	8541	8610	8624	8544	7137	7132	8569	8038	5623	7869
800 dancers	6276	5597	6450	6264	5777	5367	6318	5309	5601	5884
1600 dancers	4655	5761	5516	5557	5761	4594	5509	2057	5563	4997
3200 dancers	2527	2270	1474	1479	2202	1287	1658	0	0	1842
6400 dancers	928	1049	647	615	993	456	776	0	0	781
12800 dancers	414	383	267	265	271	153	158	0	0	273
25600 dancers	0	78	60	60	84	-880	-7944	0	0	71
Average	4807	4800	4780	4745	4558	4107	3887	3885	3073	

Figure 2: Scores of teams per number of dancers

- ▶ each row is a heat map, blue being better score
- ▶ **Our group (g2) scores the best Average**, closely followed by g7
- ▶ Next best score is by g6 and g9, which share a rather noticable correlation!



# Team categories

- ▶ g1 and g7
  - ▶ score well on all categories
  - ▶ thus score highest and second higher respectively
- ▶ g6, g9, g4
  - ▶ score well on small category
- ▶ g5
  - ▶ scores well on Large category
  - ▶ but fails to perform on Small

# Relative Performance

group dancers	relative score									
	g2	g7	g6	g9	g5	g1	g4	g8	g3	
100 dancers	1.06	1.06	1.07	1.06	1.05	1.03	1.07	1.06	0.54	1.00
200 dancers	1.08	1.03	1.08	1.08	0.97	1.00	1.08	1.05	0.63	1.00
400 dancers	1.09	1.09	1.10	1.09	0.91	0.91	1.09	1.02	0.71	1.00
800 dancers	1.07	0.95	1.10	1.06	0.98	0.91	1.07	0.90	0.95	1.00
1600 dancers	0.93	1.15	1.10	1.11	1.15	0.92	1.10	0.41	1.11	1.00
3200 dancers	1.37	1.23	0.80	0.80	1.20	0.70	0.90	0.00	0.00	1.00
6400 dancers	1.19	1.34	0.83	0.79	1.27	0.58	0.99	0.00	0.00	1.00
12800 dancers	1.52	1.40	0.98	0.97	0.99	0.56	0.58	0.00	0.00	1.00
25600 dancers	0.00	1.11	0.85	0.85	1.19	-12.48	-112.68	0.00	0.00	1.00

Figure 3: Relative scores of teams per number of dancers

## Relative Performance

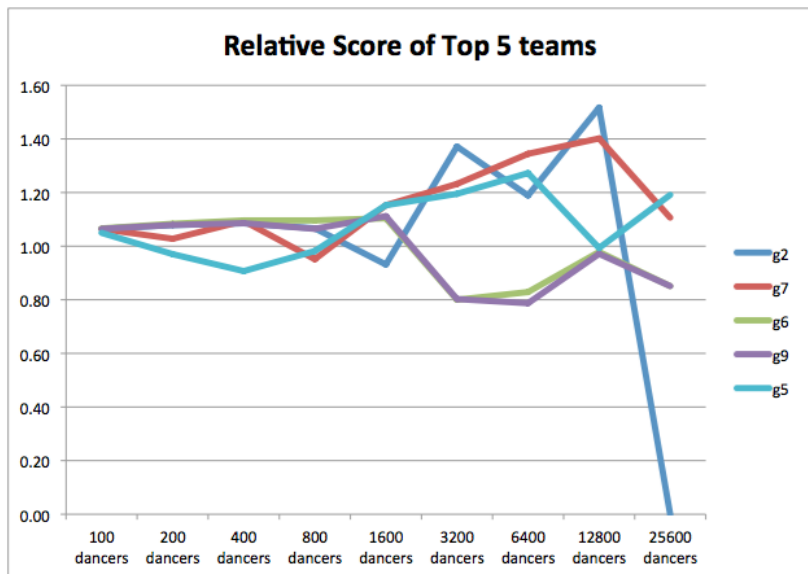


Figure 4: Plot of relative scores of top 5 teams

# Relative Performance

- ▶ strength is relatively stronger scores in Large category
- ▶ to order, we follow a simple average, which seems to favor Small category
- ▶ Yet we achieve the highest overall average
- ▶ testimony to our performance across categories

## Performance in Large category

- ▶ For Large category, our strategy has step behavior
- ▶ g7 seems to have a more continuous looking behavior

friends	batch size	num		num dancing
		batches	target score	cols
3200	1680	2	2545	42
6400	1520	5	1002	38
12800	1280	10	439	32
25600	720	36	105	18

- ▶ claustrophobia to mitigate:  $-50 = 16$  turns
- ▶ target score:  $105 = 35$  turns
- ▶ 50 turns for dancing per batch
- ▶ 10 turns for moving per batch
- ▶  $1800 / 60 = 30$  batches can be handled