

## Appendix A Names, Coordinates and ID numbers of Stands

Table 2: Names, Coordinates and ID numbers of Stands. Number J1 to J60 were 60 empty locations that we chose by our own discretion in order to find out lower value of energy configuration.

standID	number	type	name	x	y
1	A1	chinese restaurant zone	shanghai 456 restaurant	25.9754	16.6909
2	A2	chinese restaurant zone	metró pole	26.0947	16.106
3	A3	chinese restaurant zone	wong long frutos do mar casa de pasto	26.0947	15.535
4	A4	chinese restaurant zone	estabelecimento de comdas teng hou	26.0125	14.9698
5	A5	chinese restaurant zone	li jing xuan restaurante	25.8371	14.4576
6	A6	chinese restaurant zone	restaurante beautiful world	25.5923	13.9432
7	A7	chinese restaurant zone	estabelecimento de comdas tai long fong	25.3305	13.4876
8	A8	chinese restaurant zone	the plaza restaurant	24.9698	12.9823
9	A9	chinese restaurant zone	café rose garden	24.6543	12.6152
10	A10	chinese restaurant zone	estabelecimento de comdas seng cheong	24.2989	12.246
11	A11	chinese restaurant zone	estabelecimento de comdas fu loi mei sek	23.9314	11.9047
12	A12	chinese restaurant zone	estabelecimento de comdas tam kah barbatana	23.5566	11.6261
13	A13	chinese restaurant zone	estabelecimento de comdas soi lou weng fan tim	23.145	11.3575
14	A14	chinese restaurant zone	chan heng	22.7573	11.1175
15	A15	chinese restaurant zone	fok lam seng	22.3373	10.9144
16	A16	chinese restaurant zone	estabelecimento de comdas teng seng chuen yue	21.9011	10.7276
17	A17	chinese restaurant zone	vaca gorda	21.4973	10.5685
18	B1	european delicacies zone	estabelecimento de comdas pan one	20.9878	15.1472
19	B2	european delicacies zone	estabelecimento de comdas portuguesa porto	21.4644	17.337
20	B3	european delicacies zone	a cozinha mariana	21.4644	16.8913
21	B4	european delicacies zone	est abeleamento de codas café de novo tomato	21.4644	16.4748
22	B5	european delicacies zone	est abeleamento de codas san man fa	21.4644	16.025
23	B6	european delicacies zone	la gondola	21.4644	14.6932
24	B7	european delicacies zone	est abeleamento de codas"tain hao hui"	21.4644	17.7542
25	B8	european delicacies zone	est abeleamento de codas nova facção notari italia cozinha	20.9878	15.6011
26	B9	european delicacies zone	reataurante amigo cozinhbros	21.4644	15.6011
27	B10	european delicacies zone	est abeleamento de codas frangts grill	21.4644	15.1472
28	B11	european delicacies zone	cakez café	20.9878	17.7542
29	C1	dessert zone	KIKA GELATO	19.1208	9.9518
30	C2	dessert zone	MACAU SPIRT	18.7347	10.0897
31	C3	dessert zone	leit aria i son	18.352	10.2201
32	C4	dessert zone	Antique Macau	17.9413	10.3888

33	C5	dessert zone	CC MOCHI	17.5603	10.5548
34	C6	dessert zone	GaoXing	17.2588	12.0906
35	C7	dessert zone	half lemon	17.6326	12.0083
36	C8	dessert zone	gong cha(sucursal)	17.9323	11.9947
37	C9	dessert zone	lemoncello(macau)companha limtada	18.8584	12.1399
38	C10	dessert zone	ESTABELECIMENTO O DE BEBIDAS NUSANT ARA-NAM YEONG	19.2352	12.3266
39	C11	dessert zone	one more drink	19.5499	12.5703
40	C12	dessert zone	good day good time	19.8645	12.8386
41	C14	dessert zone	tea water	21.014	11.177
42	C15	dessert zone	mick yi kei	21.2979	11.2969
43	C16	dessert zone	ice on me	21.5722	11.4127
44	C17	dessert zone	laraki	21.8561	11.5326
45	C18	dessert zone	angel box	22.2441	11.6842
46	C19	dessert zone	EST ABELECIMENTO DE COMDAS HUI LAU SHAN	22.5247	11.8116
47	C20	dessert zone	mrs fa	22.7959	11.9347
48	C21	dessert zone	Richa	20.8896	11.4672
49	C22	dessert zone	degree 45	21.1736	11.5871
50	C23	dessert zone	time hes coffee	21.4479	11.7029
51	C24	dessert zone	wheel cake	21.7318	11.8229
52	C25	dessert zone	tiger sugar	22.1121	11.971
53	C26	dessert zone	PADARA DA GUIA	22.3927	12.0984
54	C27	dessert zone	EST ABELECIMENTO DE CODAS JAPONESAS SAMKU	22.6639	12.2215
55	C28	dessert zone	little azucar	22.9445	12.349
56	C29	dessert zone	digreen	23.0765	12.0621
57	D1	asia delicicas zone	ESTAELECIMENTO DE COMDAS COREANASTAE LN DAE	24.342	14.5907
58	D2	asia delicicas zone	ESTAELECIMENTO DE COMDAS TPICAS COREA KONG NAM UN	24.342	15.0619
59	D3	asia delicicas zone	EST ABELECIMENTO DE COMDAS DO MPERO ROYAL TALANDES	23.1007	13.7432
60	D4	asia delicicas zone	ESTABELECIMENTO DE COMDAS TIN LUMLOUA DE SOPA DE FITAS	23.1007	14.2057
61	D5	asia delicicas zone	idian garden	24.7698	14.1196
62	D6	asia delicicas zone	EST ABELECIMENTO DE COMDAS HON SENG BLEAF	24.7698	14.5907
63	D7	asia delicicas zone	EST ABELECIMENTO DE COMDAS HMLAYAN CASA	24.7698	15.0619
64	D8	asia delicicas zone	EST ABELECIMENTO DE COMDAS KLLNEY	24.7698	15.533
65	D9	asia delicicas zone	EST ABELECIMENTO DE COMDAS TOP FUSION	24.7698	16.0042
66	D10	asia delicicas zone	Krua theoue	22.6744	13.2808
67	D11	asia delicicas zone	thai yummy	22.6744	13.7432
68	D12	asia delicicas zone	yawarat nina	22.6744	14.2057
69	D13	asia delicicas zone	sushi mi tei japaneses preataurant	10.7923	11.6393
70	D14	asia delicicas zone	EST ABELECIMENTO DE COMDAS SAMURAI RSH	11.0054	11.1048
71	D15	asia delicicas zone	EST ABELECIMENTO DE COMDAS TAI PAN KENG TOU	11.2746	10.5714

72	D16	asia delicicas zone	LA ONE KITCHENETTE	11.5312	10.0583
73	D17	asia delicicas zone	EST ABELECIMENTO DE COMIDAS SHISU TSUKI	11.8389	9.5682
74	D18	asia delicicas zone	EST ABELECIMENTO DE COMIDAS COZINHA JAPONESA HOKKAIDO	12.1908	9.0432
75	D19	asia delicicas zone	BARI UMA RAMEN	9.6459	9.596
76	D20	asia delicicas zone	EST ABELECIMENTO DE COMIDAS NAGANO CUIDADOS	12.5612	8.59
77	D21	asia delicicas zone	EDO JAPANESE RESTAURANT	9.2312	9.9481
78	D22	asia delicicas zone	EST ABELECIMENTO DE COMIDAS NAN TEI	8.8488	10.2894
79	D23	asia delicicas zone	COMIDAS RAMEN KOU-JI	8.4402	10.6889
80	D24	asia delicicas zone	CAFE LITTLE TOKYO	8.0617	11.0869
81	D25	asia delicicas zone	CAFE POLI	23.1007	13.2808
82	E1	local delicicas zone	ESTABELEOAMENTO DE COMIDAS OUARTO IRMÃO	19.7282	13.958
83	E2	local delicicas zone	ESTABELEOAMENTO DE COMIDAS CHUI KUN	19.4127	13.958
84	E3	local delicicas zone	DUMP LING TOWN	17.8843	13.958
85	E4	local delicicas zone	ESTABELEOAMENTO DE COMIDAS IENG FAT CHA CHAN TENG	17.5358	13.958
86	E5	local delicicas zone	ESTABELEOAMENTO DE COMIDAS ZEN CUISINE	17.1881	13.958
87	E6	local delicicas zone	ESTABELEOAMENTO DE COMIDAS LEI U MUN	16.8396	13.958
88	E7	local delicicas zone	ESTABELEOAMENTO DE COMIDAS TONG WU	16.4911	13.958
89	E8	local delicicas zone	ESTABELEOAMENTO DE COMIDAS A CHANG	16.1433	13.958
90	E9	local delicicas zone	ESTABELEOAMENTO DE COMIDAS YI YAN TANG	19.8669	16.8995
91	E10	local delicicas zone	ESTABELEOAMENTO DE COMIDAS IMPLACA BEL SPICY	19.8669	16.5771
92	E11	local delicicas zone	ESTABELEOAMENTO DE COMIDAS OMAYA	19.8669	16.2548
93	E12	local delicicas zone	ESTABELEOAMENTO DE COMIDAS POU TIN IAO MEI IAO CHOU	20.9878	17.3065
94	E13	local delicicas zone	ESTABELEOAMENTO DE COMIDAS HEY HEY	20.9878	16.8771
95	E14	local delicicas zone	ESTABELEOAMENTO DE COMIDAS NO.5 FRENCH CUISINE	20.9878	16.4648
96	E15	local delicicas zone	ESTABELEOAMENTO DE COMIDAS SUN YICK	20.9878	16.025
97	E16	local delicicas zone	ESTABELEOAMENTO DE COMIDAS HAP SENG	20.1918	16.2548
98	E17	local delicicas zone	COZINHA ASIATICA TREASURE LAKE	20.1918	16.5771
99	E18	local delicicas zone	A COZINHA DO DCM	20.1918	16.8995
100	E19	local delicicas zone	ESTABELEOAMENTO DE COMIDAS KAM JOI MA	20.1918	14.6431
101	E20	local delicicas zone	TIMES COMDASE SOPA	20.1918	14.9655
102	E21	local delicicas zone	ESTABELEOAMENTO DE COMIDAS HOI ON	20.1918	15.2878
103	E22	local delicicas zone	ESTABELEOAMENTO DE COMIDAS KAN TO POU	20.1918	15.6101
104	E23	local delicicas zone	ESTABELEOAMENTO DE COMIDAS LI LAI KA FEI MEI SHE	20.1918	15.9325
105	E24	local delicicas zone	ESTABELEOAMENTO DE COMIDASOI SIM SUM	19.8669	14.6431
106	E25	local delicicas zone	ACUELA PANELA QUENTE	19.8669	14.9655
107	E26	local delicicas zone	ESTABELEOAMENTO DE COMIDAS PR. I NCIPE KA FE MEI SEX	19.8669	15.2878
108	E27	local delicicas zone	WICKED SNOW	19.8669	15.6101
109	E28	local delicicas zone	ESTABELEOAMENTO DE OOMIOAS MS	19.8669	15.9325
110	E29	local delicicas zone	ESTABELEOAMENTO DE COMIDAS WU LOU CHA LJO NEI SEX	17.167	18.0361

111	E30	local delicicas zone	ANTIGO MACAL TRADICIONL	16.8607	17.8911
112	E31	local delicicas zone	ESTABELECIMENTO DE COMIDAS GATOS DE SABOR HUN YUET	16.5382	17.7468
113	E32	local delicicas zone	ESTABELECIMENTO DE COMIDAS COZINHA DA ARTE	16.2584	17.599
114	E33	local delicicas zone	ESTABELEGMENTO DE COMIDAS MEU BISTRO	15.937	17.4291
115	E34	local delicicas zone	ESTABELECIMENTO DE COMIDAS CHENGDU HOT POT	20.3587	13.958
116	E35	local delicicas zone	ESTABELECIMENTO DE COMIDAS YONG TAI NEI SN	15.7948	13.958
117	E36	local delicicas zone	VEGETARIAN DE GONGDEMEN	20.0418	13.958
118	G1	sponsor	PASTEKARIA YENG KEE	24.3496	16.0042
119	G2	sponsor	PASTEKARIA YENG KEE	24.3496	15.5331
120	G3	sponsor	SOCIEDADE DE JOGOS DE MACAU, S.A.	24.3496	14.1196
121	G5	sponsor	BANK OF CHINA MACAU BRANCH	23.1007	14.6681
122	G6	sponsor	MACAU PASS S.A.	22.6744	14.6681
123	G7	sponsor	MACAU INDUSTRIAL LIMITED	20.3929	13.5369
124	G8	sponsor	MACAU INDUSTRIAL LIMITED	20.1811	13.1701
125	G9	sponsor	COMPANHADECHAMACAUVALLN LMITADA	9.6923	15.2651
126	H1	game booth	PERFECT SHOT	13.3303	16.7161
127	H2	game booth	STADB STILL	12.7954	16.2812
128	H3	game booth	TREASURE BUCKETS	12.3299	15.9027
129	H4	game booth	GOURMENT PARA DISE	11.8661	15.5257
130	H5	game booth	ROLLER BALL	11.4005	15.1472
131	H6	game booth	ROTARY ANIMAL PARK	8.834	12.7724
132	H7	game booth	HOPPING FROG	9.3585	14.0929
133	H8	game booth	SLAMBDUNK	8.747	14.7145
134	H9	game booth	FISH CATCHER	8.3909	15.7023
135	H10	game booth	COINING AROUND	8.0627	16.3472
136	H11	game booth	SANDY SKEE BALL	7.8306	17.643
137	I6	other	BEER&SANCK	20.9878	14.6932
138	I7	other	BEER&SANCK	8.2676	11.98
139	I10	other	POPCORN&COTTON CANDY	19.7954	10.6412
140	I11	other	POPCORN&COTTON CANDY	23.8712	16.7128
141	J1			15.8448	14.5245
142	J2			15.8448	14.9642
143	J3			15.8448	15.4039
144	J4			15.8448	15.8436
145	J5			15.8448	16.2833
146	J6			15.8448	16.723
147	J7			16.2933	14.5245
148	J8			16.2933	14.9642
149	J9			16.2933	15.4039

Predictions on the Population Density and the Net Crowd Flow

150	J10	16.2933	15.8436
151	J11	16.2933	16.2833
152	J12	16.2933	16.723
153	J13	16.7421	14.5245
154	J14	16.7421	14.9642
155	J15	16.7421	15.4039
156	J16	16.7421	15.8436
157	J17	16.7421	16.2833
158	J18	16.7421	16.723
159	J19	17.191	14.5245
160	J20	17.191	14.9642
161	J21	17.191	15.4039
162	J22	17.191	15.8436
163	J23	17.191	16.2833
164	J24	17.191	16.723
165	J25	17.6395	14.5245
166	J26	17.6395	14.9642
167	J27	17.6395	15.4039
168	J28	17.6395	15.8436
169	J29	17.6395	16.2833
170	J30	17.6395	16.723
171	J31	18.0842	14.5245
172	J32	18.0842	14.9642
173	J33	18.0842	15.4039
174	J34	18.0842	15.8436
175	J35	18.0842	16.2833
176	J36	18.0842	16.723
177	J37	18.529	14.5245
178	J38	18.529	14.9642
179	J39	18.529	15.4039
180	J40	18.529	15.8436
181	J41	18.529	16.2833
182	J42	18.529	16.723
183	J43	18.9746	14.5245
184	J44	18.9746	14.9642
185	J45	18.9746	15.4039
186	J46	18.9746	15.8436
187	J47	18.9746	16.2833
188	J48	18.9746	16.723

189	J49	15.4676	6.2612
190	J50	15.4676	6.7009
191	J51	15.4676	7.1406
192	J52	15.4676	7.5803
193	J53	15.4676	8.02
194	J54	15.4676	8.4597
195	J55	15.9132	6.2612
196	J56	15.9132	6.7009
197	J57	15.9132	7.1406
198	J58	15.9132	7.5803
199	J59	15.9132	8.02
200	J60	15.9132	8.4597
End of Table 2			

Type		Chinese restaurant zone	European delicacies zone	Dessert zone	Asia delicacies zone	Local delicacies zone	Game booth	Sponsor and Other
Time stamp								
2021/11/5 am 10:58:33		9	7	10	9	8	8	6
2021/11/5 am 10:59:29		4	3	8	6	7	9	8
2021/11/5 am 11:00:00		7	8	9	8	7	9	7
2021/11/5 am 11:01:45		9	4	10	7	4	10	8
2021/11/5 am 11:06:10		10	9	9	9	8	3	5
2021/11/8 am 8:28:54		10	5	9	9	3	3	3
2021/11/8 am 8:54:37		5	8	8	9	7	4	4
2021/11/8 pm 12:28:14		1	7	9	8	6	5	5
2021/11/8 pm 2:25:51		8	7	7	6	9	6	7
2021/11/8 pm 2:35:05		7	8	10	7	8	8	7
2021/11/8 pm 6:03:14		5	7	6	6	6	2	2
2021/11/17 pm 11:18:02		9	8	7	8	7	9	3
2021/11/17 pm 11:30:59		5	8	8	6	7	5	6
2021/11/17 pm 11:53:06		10	10	8	8	10	5	5
2021/11/18 am 5:00:23		9	5	7	8	9	6	7
2021/11/18 am 8:46:09		10	5	5	10	10	9	7
2021/11/18 am 11:01:20		8	6	7	8	9	5	7
2021/11/18 pm 12:32:19		9	9	9	9	7	2	5
2021/11/18 pm 11:50:20		10	10	10	10	10	10	10
2021/11/19 am 1:46:52		3	7	7	7	7	5	5
2021/11/19 am 8:48:43		10	8	8	8	8	6	6
2021/11/19 am 9:01:30		9	9	7	7	7	5	6
2021/11/26 am 9:02:39		10	10	10	10	10	10	10
2021/11/26 am 9:03:46		5	8	8	8	9	2	10
2021/11/26 am 9:04:47		5	5	5	5	5	5	5
2021/11/26 am 9:06:50		8	8	8	8	8	8	8
2021/11/26 am 9:07:09		4	5	8	4	5	5	6
2021/11/26 am 9:07:51		8	6	9	7	5	10	9
2021/11/26 am 9:10:15		4	8	10	8	6	1	3
2021/11/26 am 9:11:17		4	8	8	8	9	10	10
2021/11/26 pm 2:14:52		7	10	10	8	10	6	9
2021/11/26 pm 2:18:52		3	4	7	8	9	1	5
2021/11/26 pm 2:18:54		8	7	8	8	7	9	9
2021/11/26 pm 2:19:15		7	8	7	9	9	5	3
2021/11/26 pm 2:19:21		1	5	10	5	7	1	5
2021/11/26 pm 2:19:45		1	1	2	4	6	6	6
2021/11/26 pm 2:20:22		6	9	10	9	7	10	10
2021/11/26 pm 2:20:24		8	6	5	8	7	1	2
2021/11/26 pm 2:20:33		7	7	10	9	8	10	10
2021/11/26 pm 2:21:19		8	7	10	5	10	6	6
2021/11/26 pm 2:21:46		7	8	10	8	8	3	8
2021/11/26 pm 2:22:07		5	8	9	8	7	5	6
2021/11/26 pm 2:23:20		1	1	1	1	1	1	1
2021/11/26 pm 2:25:46		4	6	10	5	7	8	5
2021/11/26 pm 10:30:53		8	8	8	8	8	7	7
2021/11/26 pm 11:28:21		5	5	9	7	6	10	7
average		6.543	6.870	8.043	7.013	7.348	5.957	6.283
standard deviation of mean		0.403	0.313	0.298	0.263	0.280	0.442	0.347

Table 3: Grand questionnaire.

# Appendix C Chinese restaurant zone

Time stamp	StandID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2021/11/3 pm 7:47:26		6	4	5	5	4	3	5	7	7	6	4	4	4	5	4	5	6
2021/11/5 am 11:02:20		10	7	9	8	10	5	8	9	6	9	6	10	6	10	6	9	7
2021/11/5 am 11:02:46		9	7	9	8	7	10	9	10	7	9	7	8	9	8	7	10	10
2021/11/5 am 11:05:48		7	6	6	5	4	5	5	5	5	3	8	6	6	6	5	5	8
2021/11/5 am 11:06:42		5	10	3	8	4	6	8	3	7	6	4	6	4	4	8	4	7
2021/11/5 am 11:09:39		2	4	10	10	8	5	9	9	4	3	2	10	10	10	2	10	3
2021/11/17 pm 11:22:45		7	4	5	5	5	1	6	3	7	5	6	2	1	5	5	7	5
2021/11/18 am 5:11:04		8	8	9	9	9	8	7	8	9	9	8	8	8	8	9	9	8
2021/11/18 am 11:11:25		8	8	9	9	8	8	8	8	8	8	8	9	8	7	8	9	8
2021/11/19 am 8:58:56		9	9	9	9	9	9	8	9	8	8	8	9	8	8	9	9	8
2021/11/26 am 9:08:45		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	1	10
2021/11/26 am 9:09:11		8	7	6	7	7	6	7	8	8	7	7	7	7	8	8	7	7
2021/11/26 am 9:14:40		8	9	6	7	7	9	8	8	6	8	8	7	9	6	8	7	8
2021/11/26 am 9:15:36		7	5	8	6	3	6	4	10	5	3	3	8	4	3	5	4	7
2021/11/26 am 9:15:46		7	5	7	8	7	5	5	4	6	3	3	3	3	3	3	3	5
2021/11/26 am 9:17:10		7	7	9	6	8	9	8	8	7	9	7	9	8	7	9	7	7
2021/11/26 am 9:21:07		7	8	7	8	9	6	7	9	7	8	6	9	8	7	6	9	7
2021/11/26 am 9:21:19		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	1	10
2021/11/26 pm 2:26:39		7	8	9	8	7	9	9	10	8	8	9	7	8	8	9	8	8
2021/11/26 pm 2:27:08		4	5	7	5	6	3	6	4	8	6	7	5	7	5	6	5	9
2021/11/26 pm 2:27:32		9	8	9	9	8	8	9	10	10	9	8	9	9	8	8	9	8
2021/11/26 pm 2:28:18		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	9
2021/11/26 pm 2:29:48		6	5	5	6	7	8	6	7	8	6	5	9	8	7	6	6	7
2021/11/26 pm 2:30:30		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2021/11/26 pm 2:31:21		8	9	8	10	6	7	9	8	10	7	8	9	8	10	8	9	7
2021/11/26 pm 2:32:31		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2021/11/26 pm 2:33:07		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	1	10
2021/11/26 pm 2:33:53		3	6	3	5	4	1	1	2	1	1	3	2	1	3	2	1	8
2021/11/26 pm 2:34:08		10	4	3	3	4	1	4	10	2	3	3	5	2	3	2	3	1
2021/11/26 pm 2:36:01		3	3	2	2	3	3	3	4	1	1	1	5	5	2	2	1	1
2021/11/26 pm 10:36:08		8	8	8	8	8	8	8	8	9	9	8	8	8	10	8	8	8
2021/11/26 pm 11:31:26		3	3	3	3	3	3	3	3	3	3	3	3	3	10	3	3	3
average		6.875	6.594	6.813	6.906	6.531	6.125	6.688	7.125	6.594	6.281	6.063	6.906	6.438	6.719	6.250	6.594	6.813
standard deviation of mean		0.435	0.416	0.461	0.432	0.428	0.513	0.436	0.487	0.475	0.504	0.464	0.470	0.498	0.476	0.477	0.510	0.450

Table 4: Chinese restaurant zone.



Time stamp	StandID	18	19	20	21	22	23	24	25	26	27	28
2021/11/5 am 10:59:06		8	10	5	10	10	4	9	7	10	7	10
2021/11/5 am 11:01:03		7	8	7	8	7	7	5	6	5	6	6
2021/11/5 am 11:01:39		8	5	7	5	4	8	7	5	4	8	9
2021/11/5 am 11:02:21		8	3	3	7	4	5	9	10	4	6	8
2021/11/5 am 11:08:33		9	10	5	3	3	9	9	9	4	10	3
2021/11/8 am 8:29:15		8	3	5	7	4	3	3	9	7	9	6
2021/11/8 pm 12:29:31		7	7	6	6	7	7	7	7	6	8	6
2021/11/17 pm 11:18:28		6	6	8	7	7	6	4	7	7	7	9
2021/11/17 pm 11:56:41		7	7	4	4	4	7	5	8	5	8	6
2021/11/18 am 5:01:48		7	9	6	8	6	7	7	8	7	8	8
2021/11/18 am 8:48:10		10	6	3	6	7	6	10	6	7	10	6
2021/11/18 am 11:02:37		6	7	6	8	8	8	9	8	7	8	8
2021/11/19 am 8:50:03		6	8	5	6	5	7	7	8	8	8	6
2021/11/19 am 9:02:11		7	8	7	7	6	7	7	7	7	7	7
2021/11/26 am 9:03:10		10	10	10	10	10	10	10	10	10	10	10
2021/11/26 am 9:05:10		5	5	5	5	5	5	5	5	5	5	5
2021/11/26 am 9:05:40		8	5	5	5	7	6	8	7	7	10	7
2021/11/26 am 9:08:11		5	6	7	8	7	6	5	9	7	8	6
2021/11/26 am 9:09:07		10	10	10	10	10	10	10	10	10	10	10
2021/11/26 am 9:10:44		9	6	7	6	5	9	10	8	4	8	6
2021/11/26 am 9:12:04		8	5	7	4	5	7	8	8	6	8	6
2021/11/26 am 9:13:15		9	7	6	6	7	8	10	8	7	10	6
2021/11/26 pm 2:19:39		8	7	8	7	7	8	9	8	7	9	6
2021/11/26 pm 2:19:54		8	7	5	6	4	6	8	4	4	5	10
2021/11/26 pm 2:20:05		8	8	6	7	8	5	4	8	8	9	4
2021/11/26 pm 2:20:06		5	4	5	7	4	6	6	7	6	7	6
2021/11/26 pm 2:20:43		9	9	8	6	8	10	6	9	8	7	9
2021/11/26 pm 2:21:09		9	9	10	8	9	10	8	8	8	7	6
2021/11/26 pm 2:21:42		5	5	5	5	5	7	3	3	3	5	3
2021/11/26 pm 2:21:50		10	5	2	5	1	3	6	9	3	4	7
2021/11/26 pm 2:22:56		6	4	7	5	3	5	9	7	7	7	5
2021/11/26 pm 2:23:10		8	8	8	8	8	8	9	9	9	9	10
2021/11/26 pm 2:23:34		10	6	5	6	5	5	10	10	8	10	7
2021/11/26 pm 2:24:11		1	1	1	1	1	1	1	1	1	1	1
2021/11/26 pm 2:27:59		6	2	2	2	2	3	1	2	2	5	3
2021/11/26 pm 10:31:40		8	8	8	8	8	8	8	8	8	8	8
2021/11/26 pm 11:28:41		7	7	8	9	7	7	8	8	6	6	5
average		7.459	6.514	6.000	6.378	5.892	6.595	7.027	7.324	6.270	7.514	6.595
standard deviation of mean		0.307	0.373	0.355	0.336	0.387	0.350	0.415	0.351	0.359	0.328	0.360

Table 5: European delicacies zone.

## Appendix E Dessert zone

Time stamp	StandID	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
2021/11/5 am 11:00:03	10	9	9	8	10	8	10	9	8	10	8	7	9	9	9	7	8	9	8	9	8	7	8	9	7	9	8	8	8
2021/11/5 am 11:02:51	9	7	10	9	10	9	9	9	9	10	9	9	9	4	6	2	4	4	7	7	6	5	5	7	8	7	6	9	8
2021/11/5 am 11:02:58	9	3	2	8	7	8	6	6	3	9	6	8	8	6	5	7	8	7	6	8	5	4	7	8	6	5	7	6	4
2021/11/5 am 11:04:55	8	8	8	8	8	8	8	9	7	8	9	9	3	3	9	10	2	9	9	2	7	1	8	4	10	1	5	7	1
2021/11/8 pm 12:31:39	7	6	8	6	8	8	6	8	6	7	8	8	5	8	7	4	7	8	9	7	8	6	8	8	9	8	9	8	8
2021/11/17 pm 11:19:44	6	3	7	4	4	4	4	4	5	6	5	4	5	6	4	4	5	5	4	4	7	4	5	5	6	5	4	4	4
2021/11/17 pm 11:31:57	6	6	8	6	10	8	8	8	8	8	10	7	7	7	4	5	4	4	8	6	6	4	8	5	6	6	5	5	5
2021/11/18 am 12:00:22	7	7	9	6	7	8	7	8	7	7	8	8	7	7	6	7	6	7	6	9	7	7	8	6	7	6	8	7	7
2021/11/18 am 11:05:13	7	7	10	6	6	6	6	6	6	6	7	7	7	7	6	5	6	6	5	6	6	5	7	8	6	7	6	8	6
2021/11/19 am 8:53:01	5	5	9	6	5	5	5	5	5	5	6	5	5	5	5	5	5	5	5	5	6	5	5	5	5	5	5	5	5
2021/11/19 am 9:04:23	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2021/11/26 am 9:04:47	7	9	7	8	4	6	6	5	5	7	6	6	8	7	5	4	3	4	7	7	7	5	9	4	6	7	8	8	8
2021/11/26 am 9:10:11	10	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	9	9	9	10	9	10	9	9	10	6	9	10	9
2021/11/26 am 9:12:09	8	10	6	4	3	3	3	7	9	8	3	6	9	5	8	6	3	4	1	1	5	6	8	3	10	8	4	6	4
2021/11/26 am 9:12:31	6	7	4	7	8	7	8	7	8	6	7	5	8	8	4	7	8	7	4	6	6	5	7	8	8	4	8	7	6
2021/11/26 am 9:14:09	9	10	7	7	7	8	8	7	9	10	9	9	7	6	8	10	6	10	7	5	10	6	8	8	10	7	9	10	9
2021/11/26 am 9:16:10	9	8	9	8	8	8	8	7	9	8	9	9	8	7	9	9	8	8	7	6	8	6	6	6	6	9	8	8	9
2021/11/26 am 9:16:21	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2021/11/26 pm 2:21:51	9	8	7	8	8	6	8	8	9	8	7	8	9	8	9	7	8	9	8	9	8	7	8	7	7	8	8	9	8
2021/11/26 pm 2:22:07	8	6	10	8	6	6	8	6	10	4	6	5	6	10	7	5	6	5	8	3	3	8	1	6	9	7	6	1	6
2021/11/26 pm 2:22:10	8	6	8	9	9	9	6	6	8	5	7	9	6	9	9	7	5	9	4	8	5	8	7	9	7	9	7	8	9
2021/11/26 pm 2:22:20	10	10	10	10	10	10	10	10	10	10	10	10	9	8	8	10	9	9	9	8	9	9	9	9	10	8	10	10	9
2021/11/26 pm 2:23:01	5	5	5	3	3	3	3	2	6	3	5	4	5	3	6	7	4	6	6	5	4	4	4	6	6	10	6	2	3
2021/11/26 pm 2:24:21	4	8	6	4	4	4	6	5	8	9	7	10	10	6	5	7	6	8	10	8	7	3	6	6	7	10	8	9	7
2021/11/26 pm 2:24:46	10	7	10	10	10	10	5	10	10	10	3	5	2	1	7	10	6	8	10	1	1	10	3	2	3	2	10	7	10
2021/11/26 pm 2:25:18	10	10	7	10	10	10	10	10	10	10	10	10	10	10	10	10	10	6	10	8	10	10	10	10	10	10	10	10	10
2021/11/26 pm 2:25:41	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2021/11/26 pm 2:25:53	8	9	8	8	8	8	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	9	9	9	10	7	9	10	10
2021/11/26 pm 2:26:02	10	10	10	9	10	7	8	10	10	8	10	10	10	10	10	10	10	10	1	6	10	10	10	10	10	10	8	10	10
2021/11/26 pm 2:30:24	8	9	7	8	8	8	9	10	10	10	8	8	10	8	8	9	8	8	8	8	10	10	10	9	9	8	8	9	8
2021/11/26 pm 10:33:08	10	9	9	10	10	10	9	7	7	10	6	6	9	7	6	10	8	7	10	5	10	5	9	10	10	5	5	5	5
2021/11/26 pm 11:29:34	7	9	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
average	7.906	7.406	7.688	7.438	7.313	7.031	7.031	7.344	7.875	7.813	7.219	7.438	7.531	6.844	7.156	7.063	6.719	7.094	6.688	6.250	6.906	6.531	6.906	7.000	7.906	6.750	7.188	7.219	7.063
standard deviation of mean	0.377	0.426	0.408	0.414	0.463	0.463	0.463	0.415	0.411	0.417	0.425	0.411	0.438	0.445	0.381	0.444	0.450	0.432	0.482	0.467	0.448	0.464	0.470	0.428	0.412	0.433	0.415	0.453	0.447

Table 6: Dessert zone.

## Appendix F Asia delicicas zone

Time stamp	StandID	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
2021/11/3 pm 7:48:33		7	6	9	6	5	5	4	4	4	4	8	6	4	6	6	5	4	4	4	5	4	6	6	4	6
2021/11/5 am 11:01:56		10	8	9	7	9	8	10	7	10	10	7	10	9	7	7	9	8	7	10	8	10	7	10	6	10
2021/11/5 am 11:05:17		9	9	7	10	7	6	7	7	7	5	6	5	7	9	10	9	8	7	8	7	6	8	8	6	7
2021/11/5 am 11:06:21		5	4	7	6	3	8	5	8	4	8	4	4	7	5	6	8	10	10	4	6	8	7	9	9	9
2021/11/5 am 11:08:39		9	3	2	5	3	8	9	2	9	4	9	10	10	2	9	4	10	4	2	2	10	2	1	1	10
2021/11/8 pm 12:33:34		5	5	7	6	7	6	6	7	7	7	8	6	9	9	9	9	9	9	8	9	9	8	9	9	8
2021/11/17 pm 11:21:58		6	6	5	6	6	6	5	8	7	8	7	6	6	4	6	6	7	7	7	7	6	7	6	6	4
2021/11/18 am 5:09:52		7	7	8	9	8	7	7	8	8	8	8	9	7	7	7	7	6	8	7	7	8	7	8	7	7
2021/11/18 am 11:10:08		7	8	6	7	6	6	6	6	7	7	8	8	9	9	8	7	7	8	8	8	8	8	8	7	7
2021/11/19 am 8:57:48		6	6	6	7	7	6	5	5	5	5	5	5	5	6	5	5	5	5	5	5	5	5	5	5	5
2021/11/19 am 9:00:47		8	8	8	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
2021/11/26 am 9:07:27		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2021/11/26 am 9:08:46		7	6	6	7	7	5	6	7	7	7	7	6	6	8	7	7	6	7	6	9	8	8	8	7	7
2021/11/26 am 9:13:57		10	8	9	9	7	4	5	6	4	6	10	7	10	10	7	9	7	9	8	9	9	5	8	6	8
2021/11/26 am 9:15:09		6	8	5	5	2	1	5	3	10	8	4	3	6	10	9	6	10	10	6	5	10	10	10	7	7
2021/11/26 am 9:15:11		10	10	7	8	5	5	5	7	8	5	5	7	9	9	7	8	7	8	6	8	8	9	8	6	8
2021/11/26 am 9:16:32		7	6	8	6	8	6	8	5	8	7	8	7	8	6	8	6	9	7	6	9	7	9	8	8	8
2021/11/26 am 9:20:27		6	5	6	5	4	8	7	9	10	7	9	6	9	10	9	8	10	10	9	8	8	10	9	8	6
2021/11/26 am 9:20:55		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2021/11/26 pm 2:21:42		6	2	7	2	8	8	2	8	2	8	3	8	8	7	8	2	8	9	10	8	8	7	8	5	6
2021/11/26 pm 2:25:57		9	9	9	8	7	7	6	6	8	9	8	8	10	10	9	9	8	9	7	8	9	7	8	8	7
2021/11/26 pm 2:26:20		5	3	8	7	5	8	7	2	5	6	4	3	5	7	8	4	5	6	4	7	4	7	6	2	4
2021/11/26 pm 2:26:46		8	7	9	8	7	9	9	8	7	8	9	8	8	10	10	7	8	8	8	9	7	8	9	8	8
2021/11/26 pm 2:27:31		9	9	9	8	9	9	8	8	9	8	8	9	8	8	9	9	9	10	9	9	9	9	8	9	8
2021/11/26 pm 2:28:49		9	8	7	7	5	6	7	8	9	7	6	7	8	10	8	8	8	9	8	9	9	8	8	8	4
2021/11/26 pm 2:29:11		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2021/11/26 pm 2:30:38		9	8	9	7	10	7	9	8	10	8	9	7	10	9	8	7	9	8	7	10	8	7	10	9	8
2021/11/26 pm 2:30:51		5	2	4	4	4	3	2	4	3	4	4	5	2	2	4	2	2	2	2	2	2	2	2	2	1
2021/11/26 pm 2:31:28		10	10	10	10	8	8	9	8	10	10	9	9	1	10	10	10	10	10	10	10	10	10	10	10	10
2021/11/26 pm 2:31:53		10	10	9	9	8	8	8	8	10	9	10	8	10	10	10	10	10	10	10	10	10	10	10	10	9
2021/11/26 pm 2:32:30		1	4	4	1	1	3	10	5	8	2	5	4	1	10	10	10	3	7	7	7	7	10	8	3	2
2021/11/26 pm 2:35:14		3	3	3	3	2	3	4	1	2	6	1	5	7	8	5	6	7	8	5	8	6	7	6	6	5
2021/11/26 pm 10:35:34		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
2021/11/26 pm 11:31:06		5	5	5	5	5	5	5	5	5	5	5	5	3	7	8	9	5	5	5	5	5	5	5	5	5
average		7.147	6.529	7.029	6.588	6.147	6.324	6.559	6.265	7.000	6.794	6.735	6.647	6.971	7.647	7.794	7.000	7.353	7.529	6.794	7.294	7.559	7.235	7.324	6.471	6.735
standard deviation of mean		0.425	0.449	0.395	0.412	0.433	0.391	0.405	0.412	0.455	0.377	0.427	0.380	0.480	0.434	0.350	0.420	0.413	0.399	0.420	0.404	0.399	0.392	0.436	0.445	0.421

Table 7: Asia delicicas zone.

## Appendix G Local delicicas zone

StandID	Time stamp	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117			
	2021/11/3 pm 7:50:48	8	7	8	6	6	5	6	6	4	7	9	8	7	6	7	7	5	4	4	7	5	6	7	7	7	4	7	5	5	4	5	3	4	2	3	6			
	2021/11/5 am 11:04:06	9	8	7	7	6	7	6	9	10	9	10	8	5	10	2	2	5	1	3	4	5	7	5	4	6	4	8	4	8	4	6	5	10	10	6	8			
	2021/11/5 am 11:05:17	10	1	7	3	4	2	7	6	10	10	10	8	10	10	10	2	2	5	1	3	4	5	7	5	4	6	4	8	4	8	4	2	4	9	10	6	8		
	2021/11/5 am 11:06:27	9	6	7	1	2	3	5	2	8	7	9	10	3	10	3	6	4	5	5	4	3	3	2	2	3	1	1	1	1	1	1	2	4	9	2	6	4		
	2021/11/8 am 8:56:59	7	7	5	6	4	3	5	5	5	6	9	8	8	8	8	7	7	7	8	7	8	8	7	7	7	6	7	5	7	6	6	6	8	10	6	2	4		
	2021/11/18 pm 2:26:56	5	6	5	4	3	7	7	6	4	3	4	8	2	8	5	4	3	4	6	8	10	3	3	3	3	1	5	8	4	4	4	2	7	3	4	2	5		
	2021/11/17 pm 11:20:50	7	7	5	5	4	6	8	3	5	4	3	4	8	4	4	4	4	4	7	7	2	6	5	5	3	7	5	5	5	5	5	6	3	7	4	2	4		
	2021/11/18 am 12:02:47	8	8	3	5	5	1	6	6	6	3	6	6	6	6	6	6	6	6	6	8	6	6	5	4	8	5	5	5	5	5	5	5	6	6	8	8			
	2021/11/18 am 5:07:01	7	8	7	8	8	7	8	7	8	7	7	7	8	8	7	7	7	9	8	7	8	8	8	8	8	7	8	7	6	8	9	8	8	7	7	8	8		
	2021/11/18 am 11:07:15	7	8	7	7	7	7	7	9	8	7	7	7	8	8	8	8	8	8	7	8	8	8	8	7	7	7	8	7	6	7	7	7	8	8	7	7	6		
	2021/11/19 am 8:55:09	6	6	6	6	6	6	9	8	6	6	6	8	7	8	8	8	8	7	7	6	6	6	7	7	7	6	6	6	6	6	6	6	6	6	6	6	7	6	
	2021/11/19 am 9:06:21	6	6	6	6	6	6	6	9	8	6	6	8	7	8	8	8	8	7	7	6	6	6	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	7	6
	2021/11/26 am 9:05:32	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	2021/11/26 am 9:06:29	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
	2021/11/26 am 9:06:39	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	2021/11/26 am 9:07:50	5	8	7	7	6	7	6	7	6	7	6	7	6	7	8	7	7	6	7	7	8	6	8	6	6	6	7	7	6	6	8	7	8	7	8	7	8	7	
	2021/11/26 am 9:11:32	8	6	8	8	7	6	8	6	8	6	8	10	8	7	9	6	5	8	7	5	3	8	3	2	5	7	5	9	10	6	5	4	5	10	8	7	6	7	
	2021/11/26 am 9:13:42	7	8	9	6	8	6	6	6	6	10	5	8	8	6	8	6	6	8	6	7	8	6	6	6	6	6	7	6	9	5	4	4	5	5	4	5	6	4	
	2021/11/26 am 9:13:43	6	5	7	4	5	9	6	10	5	8	8	5	8	6	8	6	6	2	5	9	5	3	3	3	8	6	5	7	3	7	6	4	4	8	8	3	8	7	
	2021/11/26 am 9:15:14	5	7	7	4	6	7	7	7	7	7	8	8	6	7	7	7	7	8	6	8	8	7	8	6	8	7	8	8	8	8	9	8	8	8	7	8	8	7	
2021/11/26 am 9:18:04	7	7	6	6	8	7	6	5	9	1	1	1	1	1	4	3	2	5	1	6	10	5	5	5	7	8	5	6	9	7	6	4	3	5	4	4	5	3		
2021/11/26 am 9:18:47	8	9	8	7	6	8	7	6	8	9	6	8	8	9	9	9	2	5	8	9	6	10	5	9	4	8	9	6	8	7	7	6	8	7	6	7	8	8		
2021/11/26 pm 2:21:06	5	7	6	4	4	5	4	5	4	5	5	5	5	8	6	8	7	4	9	8	7	5	6	8	5	7	7	7	7	8	7	8	7	6	7	6	7	8		
2021/11/26 pm 2:22:59	8	9	6	8	7	9	6	10	8	6	10	6	10	8	9	8	9	10	6	8	9	7	10	8	10	8	10	9	9	6	8	7	10	8	7	9	7	8	8	
2021/11/26 pm 2:24:04	8	9	8	8	9	8	8	6	8	6	8	9	6	8	9	9	8	7	9	8	6	6	7	5	7	7	7	8	9	6	8	6	8	5	6	4	6	8		
2021/11/26 pm 2:24:05	3	5	8	9	3	4	6	8	5	10	3	9	6	8	4	3	8	7	5	6	3	7	8	1	6	4	6	4	6	4	10	5	6	4	7	3	6	6		
2021/11/26 pm 2:24:28	8	7	9	8	7	9	8	8	8	9	7	8	6	7	8	9	8	7	9	8	6	9	8	9	9	9	7	8	7	8	9	8	9	8	8	9	7	8		
2021/11/26 pm 2:25:35	8	8	9	8	7	8	8	8	9	10	9	8	8	8	10	9	8	9	9	9	8	8	9	9	9	9	10	9	9	9	9	8	8	9	10	9	9			
2021/11/26 pm 2:26:31	5	9	7	6	7	8	7	4	6	8	8	8	5	8	7	7	7	8	6	8	6	5	7	7	8	7	6	6	8	7	8	8	7	7	7	7	6	5		
2021/11/26 pm 2:27:26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
2021/11/26 pm 2:27:37	4	10	4	7	2	4	3	7	10	4	8	4	8	4	7	6	3	4	5	4	3	2	3	5	6	4	7	6	4	4	2	8	5	4	2	8	4	4		
2021/11/26 pm 2:28:16	6	4	5	7	5	5	5	4	4	7	2	5	4	5	4	7	5	8	4	5	4	5	6	4	2	5	6	4	4	6	4	6	5	5	4	8	4	4		
2021/11/26 pm 2:29:11	10	10	8	8	6	7	7	8	10	10	10	10	10	9	8	8	7	9	10	8	7	8	9	8	10	10	9	9	8	9	7	10	10	10	10	10	10	10	10	
2021/11/26 pm 2:29:53	8	8	9	8	9	9	8	9	10	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	8	8	8	8	8	8	9	10	8	8		
2021/11/26 pm 2:32:29	3	2	7	7	8	8	8	1	10	1	1	1	1	1	10	7	5	7	6	7	6	1	6	1	6	6	1	7	10	6	6	5	4	1	2	9	5	2		
2021/11/26 pm 10:34:16	8	8	8	9	8	8	8	8	8	8	9	8	9	8	9	8	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
2021/11/26 pm 11:30:17	6	1	8	6	6	6	6	6	6	6	9	10	6	6	6	6	6	6	6	6	6	6	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
average		6.811	6.703	6.919	6.405	6.108	6.568	6.405	6.811	7.027	6.946	7.216	6.541	7.189	7.081	6.541	6.568	6.622	6.649	6.730	6.324	6.297	5.973	6.784	6.486	6.486	6.973	6.865	6.405	6.405	6.568	6.730	6.676	6.514	6.568	6.378				
standard deviation of mean		0.346	0.406	0.306	0.354	0.353	0.343	0.373	0.363	0.373	0.443	0.440	0.411	0.326	0.343	0.358	0.352	0.378	0.347	0.365	0.391	0.344	0.404	0.383	0.362	0.411	0.344	0.394	0.336	0.362	0.360	0.369	0.348	0.382	0.433	0.346	0.388			

Table 8: Local delicicas zone.

## Appendix H Sponsor and other

Time stamp	StandID	118	119	120	121	122	123	124	125	137	138	139	140
2021/11/3 pm 7:49:23		3	4	4	3	4	7	5	6	6	5	8	8
2021/11/5 am 11:01:25		10	8	8	7	9	7	10	8	9	9	7	9
2021/11/5 am 11:04:33		7	8	3	4	4	4	5	4	5	5	7	7
2021/11/5 am 11:05:40		6	4	7	3	8	4	6	7	4	5	7	6
2021/11/5 am 11:07:21		3	7	9	1	1	3	3	1	8	8	9	10
2021/11/5 am 11:07:36		3	7	6	4	7	3	9	6	7	4	2	7
2021/11/17 pm 11:21:17		3	3	2	6	4	4	4	4	7	7	6	5
2021/11/18 am 5:08:16		10	10	8	8	8	8	8	7	7	7	8	8
2021/11/18 am 11:08:41		7	7	5	5	5	4	4	7	7	8	6	6
2021/11/19 am 8:56:10		10	10	4	5	6	6	6	6	6	6	5	5
2021/11/26 am 9:08:11		7	7	7	7	5	6	8	6	6	6	7	9
2021/11/26 am 9:12:24		9	9	8	8	5	5	6	6	10	10	8	7
2021/11/26 am 9:14:09		1	4	1	1	1	1	1	1	10	10	7	9
2021/11/26 am 9:14:17		7	7	3	3	3	5	5	3	7	7	10	10
2021/11/26 am 9:15:52		5	5	8	7	8	8	8	7	8	7	7	8
2021/11/26 am 9:18:53		5	3	1	1	1	1	1	1	10	10	10	10
2021/11/26 am 9:19:44		10	10	10	10	10	10	10	10	10	10	9	9
2021/11/26 pm 2:22:00		9	3	9	2	2	8	2	10	3	8	9	2
2021/11/26 pm 2:24:40		8	8	6	7	5	6	6	6	2	2	3	3
2021/11/26 pm 2:25:09		9	9	8	7	8	7	7	8	9	9	8	7
2021/11/26 pm 2:25:28		6	4	9	7	6	5	1	1	1	1	6	5
2021/11/26 pm 2:26:38		9	9	9	8	8	8	8	8	6	6	10	10
2021/11/26 pm 2:27:20		7	7	1	3	4	5	6	4	1	1	7	7
2021/11/26 pm 2:28:05		1	1	1	1	1	1	1	1	1	1	1	1
2021/11/26 pm 2:29:04		5	5	5	10	6	5	6	5	1	1	1	1
2021/11/26 pm 2:29:38		1	1	1	5	4	5	6	8	1	1	1	1
2021/11/26 pm 2:29:58		10	10	1	1	1	1	1	1	1	1	1	1
2021/11/26 pm 2:30:00		10	10	10	10	10	10	10	10	10	10	10	10
2021/11/26 pm 2:31:12		7	7	6	6	6	6	6	6	6	6	10	10
2021/11/26 pm 2:33:31		1	1	1	10	1	1	1	1	1	1	1	1
2021/11/26 pm 10:34:48		8	8	8	8	8	8	8	8	8	8	9	9
2021/11/26 pm 11:30:34		5	5	5	5	5	5	5	5	5	6	8	5
average		6.313	6.281	5.438	5.406	5.125	5.219	5.406	5.375	5.719	5.813	6.500	6.438
standard deviation of mean		0.534	0.500	0.553	0.516	0.493	0.451	0.506	0.509	0.567	0.563	0.537	0.555

Table 9: Sponsor (stand ID: 118-125) and other (stand ID: 137-140).

## Appendix I Game booth

StandID Time stamp	126	127	128	129	130	131	132	133	134	135	136
2021/1/3 pm 7:45:29	7	5	6	4	4	6	8	9	6	4	7
2021/1/5 am 10:53:36	9	4	7	5	8	7	6	10	8	6	7
2021/1/5 am 10:59:25	10	9	9	7	7	9	7	10	9	8	7
2021/1/5 am 11:01:41	7	6	8	8	9	9	10	10	9	9	7
2021/1/5 am 11:03:29	10	3	3	9	9	10	10	3	9	5	2
2021/1/5 am 11:10:18	3	2	4	10	2	3	3	3	2	3	2
2021/1/8 pm 12:38:14	8	6	7	8	6	7	8	8	8	7	6
2021/1/8 pm 2:25:14	7	7	5	5	8	4	8	10	7	4	4
2021/1/17 pm 11:18:53	6	7	8	7	8	7	8	6	7	6	8
2021/1/17 pm 11:58:12	4	4	7	8	8	8	8	10	8	8	7
2021/1/18 am 5:03:37	7	8	8	8	8	9	9	9	9	8	7
2021/1/18 am 8:46:41	4	4	8	9	9	8	8	10	6	6	10
2021/1/18 am 11:03:32	7	6	5	6	5	5	4	5	4	4	4
2021/1/19 am 8:50:52	5	5	5	5	5	5	5	5	5	5	5
2021/1/19 am 9:02:51	5	5	5	5	5	5	5	5	5	5	5
2021/1/26 am 9:03:43	10	10	10	10	10	10	10	10	10	10	10
2021/1/26 am 9:05:36	5	5	5	5	5	5	5	5	5	5	5
2021/1/26 am 9:06:39	5	6	6	8	8	7	6	10	3	8	5
2021/1/26 am 9:11:07	7	6	7	7	6	6	6	5	7	6	7
2021/1/26 am 9:11:22	2	3	3	3	5	4	1	10	1	3	5
2021/1/26 am 9:12:03	9	8	8	10	9	8	8	8	9	8	9
2021/1/26 am 9:12:55	4	4	6	7	9	9	7	8	10	9	9
2021/1/26 am 9:13:33	1	1	1	1	1	1	1	1	10	1	1
2021/1/26 pm 2:20:21	7	3	5	4	5	5	4	4	6	5	6
2021/1/26 pm 2:20:37	8	7	9	10	9	7	8	9	7	8	8
2021/1/26 pm 2:20:47	10	5	10	9	10	10	1	10	4	6	10
2021/1/26 pm 2:20:59	5	4	3	6	4	4	5	6	4	2	4
2021/1/26 pm 2:20:59	10	10	10	10	10	10	10	10	10	10	10
2021/1/26 pm 2:21:49	10	9	9	9	9	10	8	10	9	9	9
2021/1/26 pm 2:22:45	10	7	10	7	10	4	6	10	2	4	10
2021/1/26 pm 2:23:36	6	3	5	4	6	5	8	10	6	7	6
2021/1/26 pm 2:24:22	5	5	5	5	5	5	5	6	5	5	5
2021/1/26 pm 2:24:30	1	1	1	1	1	1	1	1	1	1	1
2021/1/26 pm 2:24:45	1	1	1	1	1	1	1	1	1	1	1
2021/1/26 pm 2:25:46	3	7	6	4	8	5	4	9	4	6	3
2021/1/26 pm 2:29:10	6	5	8	7	7	10	3	1	8	7	6
2021/1/26 pm 10:32:07	8	8	8	9	9	9	9	9	9	8	8
2021/1/26 pm 11:28:57	10	10	10	10	10	10	10	10	10	10	10
average	6.368	5.500	6.342	6.605	6.789	6.526	6.158	7.263	6.395	5.974	6.189
standard deviation of mean	0.452	0.402	0.420	0.429	0.434	0.439	0.461	0.508	0.457	0.411	0.453

Table 10: Game booth.

## Appendix J Normalized effective charges $Q'$ of stands

Table 11: The normalized effective charges  $Q'$  of stands were obtained as follows. First, we calculated  $\bar{x}$  and  $\sigma_{\bar{x}}$ , referring to the mean of the popularity of the sub-categorical stand, and the standard deviation of mean for the particular stand, respectively. Second, we also calculated  $\bar{y}$  and  $\sigma_{\bar{y}}$ , respectively referring to the mean of the popularity from the grand questionnaire for a specific type of stands, and the standard deviation of mean for that particular type of stands. Third, we calculated the final mean of each stand by calculating  $\bar{xy} = \bar{x}\bar{y}$ , together with the error propagation  $\sigma_{\bar{xy}}$  described in Eq.(5). Finally we also calculated  $Q'$ s by Eq.(6) at the last column, which were the effective charges of stands in our algorithm.

StandID	Mean( $\bar{x}$ )	SD of mean( $\sigma_{\bar{x}}$ )	Mean( $\bar{y}$ ) from Grand Questionnaire	sd of mean( $\sigma_{\bar{y}}$ ) from Grand Questionnaire	Final mean ( $\bar{xy}$ )	Final sd of mean( $\sigma_{\bar{xy}}$ )	$Q'$
1	6.875	2.459	6.543	0.403	44.983	16.328	-0.443
2	6.594	2.354	6.543	0.403	43.143	15.627	-0.696
3	6.813	2.608	6.543	0.403	44.574	17.285	-0.499
4	6.906	2.441	6.543	0.403	45.188	16.212	-0.415
5	6.531	2.423	6.543	0.403	42.734	16.069	-0.752
6	6.125	2.904	6.543	0.403	40.076	19.163	-1.117
7	6.688	2.468	6.543	0.403	43.756	16.374	-0.611
8	7.125	2.756	6.543	0.403	46.619	18.261	-0.218
9	6.594	2.686	6.543	0.403	43.143	17.777	-0.696
10	6.281	2.854	6.543	0.403	41.098	18.843	-0.976
11	6.063	2.627	6.543	0.403	39.667	17.359	-1.173
12	6.906	2.656	6.543	0.403	45.188	17.601	-0.415
13	6.438	2.816	6.543	0.403	42.121	18.609	-0.836
14	6.719	2.691	6.543	0.403	43.961	17.814	-0.583
15	6.250	2.700	6.543	0.403	40.894	17.845	-1.005
16	6.594	2.883	6.543	0.403	43.143	19.052	-0.696
17	6.813	2.546	6.543	0.403	44.574	16.880	-0.499
18	7.459	1.865	6.870	0.313	51.243	13.022	0.417
19	6.514	2.268	6.870	0.313	44.745	15.716	-0.476
20	6.000	2.160	6.870	0.313	41.217	14.959	-0.960
21	6.378	2.046	6.870	0.313	43.817	14.197	-0.603
22	5.892	2.354	6.870	0.313	40.475	16.279	-1.062
23	6.595	2.127	6.870	0.313	45.302	14.759	-0.399
24	7.027	2.522	6.870	0.313	48.273	17.464	0.009
25	7.324	2.135	6.870	0.313	50.315	14.846	0.289
26	6.270	2.181	6.870	0.313	43.074	15.113	-0.705
27	7.514	1.995	6.870	0.313	51.615	13.904	0.468
28	6.595	2.192	6.870	0.313	45.302	15.197	-0.399
29	7.906	2.131	8.043	0.298	63.594	17.298	2.113
30	7.406	2.408	8.043	0.298	59.572	19.492	1.560
31	7.688	2.306	8.043	0.298	61.834	18.691	1.871
32	7.438	2.341	8.043	0.298	59.823	18.959	1.595
33	7.313	2.620	8.043	0.298	58.818	21.190	1.457
34	7.031	2.621	8.043	0.298	56.556	21.186	1.146
35	7.344	2.350	8.043	0.298	59.069	19.030	1.491
36	7.875	2.324	8.043	0.298	63.342	18.844	2.078
37	7.813	2.361	8.043	0.298	62.840	19.137	2.009
38	7.219	2.406	8.043	0.298	58.064	19.473	1.353
39	7.438	2.327	8.043	0.298	59.823	18.849	1.595
40	7.531	2.475	8.043	0.298	60.577	20.038	1.698

Predictions on the Population Density and the Net Crowd Flow

41	6.844	2.516	8.043	0.298	55.048	20.339	0.939
42	7.156	2.157	8.043	0.298	57.561	17.480	1.284
43	7.063	2.514	8.043	0.298	56.807	20.328	1.181
44	6.719	2.543	8.043	0.298	54.042	20.552	0.801
45	7.094	2.441	8.043	0.298	57.058	19.748	1.215
46	6.688	2.729	8.043	0.298	53.791	22.041	0.766
47	6.250	2.640	8.043	0.298	50.272	21.314	0.283
48	6.906	2.532	8.043	0.298	55.550	20.469	1.008
49	6.531	2.627	8.043	0.298	52.534	21.221	0.594
50	6.906	2.656	8.043	0.298	55.550	21.464	1.008
51	7.000	2.423	8.043	0.298	56.304	19.601	1.112
52	7.906	2.333	8.043	0.298	63.594	18.912	2.113
53	6.750	2.449	8.043	0.298	54.293	19.805	0.836
54	7.188	2.348	8.043	0.298	57.813	19.005	1.319
55	7.219	2.562	8.043	0.298	58.064	20.719	1.353
56	7.063	2.526	8.043	0.298	56.807	20.430	1.181
57	7.147	2.476	7.413	0.263	52.981	18.449	0.655
58	6.529	2.620	7.413	0.263	48.403	19.496	0.027
59	7.029	2.303	7.413	0.263	52.109	17.169	0.536
60	6.588	2.401	7.413	0.263	48.839	17.883	0.086
61	6.147	2.524	7.413	0.263	45.568	18.782	-0.363
62	6.324	2.279	7.413	0.263	46.877	16.978	-0.183
63	6.559	2.364	7.413	0.263	48.621	17.607	0.057
64	6.265	2.403	7.413	0.263	46.441	17.892	-0.243
65	7.000	2.651	7.413	0.263	51.891	19.741	0.506
66	6.794	2.199	7.413	0.263	50.365	16.398	0.296
67	6.735	2.490	7.413	0.263	49.929	18.544	0.236
68	6.647	2.214	7.413	0.263	49.275	16.506	0.146
69	6.971	2.801	7.413	0.263	51.673	20.847	0.476
70	7.647	2.533	7.413	0.263	56.688	18.886	1.164
71	7.794	2.042	7.413	0.263	57.778	15.273	1.314
72	7.000	2.449	7.413	0.263	51.891	18.251	0.506
73	7.353	2.411	7.413	0.263	54.508	17.974	0.865
74	7.529	2.326	7.413	0.263	55.816	17.353	1.045
75	6.794	2.447	7.413	0.263	50.365	18.226	0.296
76	7.294	2.355	7.413	0.263	54.072	17.565	0.805
77	7.559	2.325	7.413	0.263	56.034	17.349	1.075
78	7.235	2.284	7.413	0.263	53.636	17.036	0.745
79	7.324	2.543	7.413	0.263	54.290	18.951	0.835
80	6.471	2.596	7.413	0.263	47.967	19.323	-0.033
81	6.735	2.453	7.413	0.263	49.929	18.273	0.236
82	6.811	2.106	7.348	0.280	50.045	15.592	0.252
83	6.703	2.471	7.348	0.280	49.250	18.250	0.143
84	6.919	1.862	7.348	0.280	50.839	13.815	0.361
85	6.405	2.153	7.348	0.280	47.066	15.923	-0.157
86	6.108	2.145	7.348	0.280	44.881	15.850	-0.457
87	6.568	2.089	7.348	0.280	48.257	15.458	0.007
88	6.405	2.266	7.348	0.280	47.066	16.750	-0.157
89	6.811	2.209	7.348	0.280	50.045	16.343	0.252
90	7.027	2.267	7.348	0.280	51.633	16.772	0.470
91	6.946	2.697	7.348	0.280	51.038	19.914	0.388
92	7.216	2.800	7.348	0.280	53.024	20.674	0.661
93	6.541	2.501	7.348	0.280	48.059	18.468	-0.021



Predictions on the Population Density and the Net Crowd Flow

94	7.189	1.984	7.348	0.280	52.825	14.715	0.634
95	7.081	2.087	7.348	0.280	52.031	15.461	0.525
96	6.541	2.181	7.348	0.280	48.059	16.127	-0.021
97	6.568	2.141	7.348	0.280	48.257	15.842	0.007
98	6.622	2.302	7.348	0.280	48.655	17.013	0.061
99	6.649	2.111	7.348	0.280	48.853	15.623	0.088
100	6.730	2.219	7.348	0.280	49.449	16.415	0.170
101	6.324	2.381	7.348	0.280	46.470	17.585	-0.239
102	6.297	2.093	7.348	0.280	46.271	15.481	-0.266
103	6.297	2.459	7.348	0.280	46.271	18.156	-0.266
104	5.973	2.327	7.348	0.280	43.888	17.182	-0.593
105	6.784	2.200	7.348	0.280	49.846	16.278	0.225
106	6.486	2.501	7.348	0.280	47.662	18.469	-0.075
107	6.486	2.090	7.348	0.280	47.662	15.464	-0.075
108	6.973	2.398	7.348	0.280	51.236	17.726	0.416
109	6.865	2.043	7.348	0.280	50.442	15.138	0.307
110	6.405	2.204	7.348	0.280	47.066	16.296	-0.157
111	6.405	2.192	7.348	0.280	47.066	16.203	-0.157
112	6.568	2.243	7.348	0.280	48.257	16.582	0.007
113	6.730	2.117	7.348	0.280	49.449	15.667	0.170
114	6.676	2.322	7.348	0.280	49.052	17.164	0.116
115	6.514	2.631	7.348	0.280	47.860	19.420	-0.048
116	6.568	2.102	7.348	0.280	48.257	15.555	0.007
117	6.378	2.361	7.348	0.280	46.867	17.441	-0.184
118	6.313	3.021	6.283	0.347	39.659	19.104	-1.174
119	6.281	2.831	6.283	0.347	39.463	17.920	-1.201
120	5.438	3.131	6.283	0.347	34.162	19.760	-1.929
121	5.406	2.917	6.283	0.347	33.965	18.420	-1.956
122	5.125	2.791	6.283	0.347	32.198	17.625	-2.199
123	5.219	2.549	6.283	0.347	32.787	16.118	-2.118
124	5.406	2.861	6.283	0.347	33.965	18.071	-1.956
125	5.375	2.882	6.283	0.347	33.769	18.203	-1.983
126	6.368	2.784	5.957	0.442	37.934	16.822	-1.411
127	5.500	2.480	5.957	0.442	32.761	14.969	-2.121
128	6.342	2.592	5.957	0.442	37.777	15.690	-1.433
129	6.605	2.646	5.957	0.442	39.344	16.030	-1.217
130	6.789	2.673	5.957	0.442	40.442	16.200	-1.067
131	6.526	2.709	5.957	0.442	38.874	16.390	-1.282
132	6.158	2.843	5.957	0.442	36.680	17.151	-1.583
133	7.263	3.134	5.957	0.442	43.263	18.940	-0.679
134	6.395	2.814	5.957	0.442	38.090	17.001	-1.389
135	5.974	2.531	5.957	0.442	35.582	15.304	-1.734
136	6.158	2.727	5.957	0.442	36.680	16.467	-1.583
137	5.719	3.205	6.283	0.347	35.929	20.234	-1.686
138	5.813	3.187	6.283	0.347	36.518	20.124	-1.605
139	6.500	3.037	6.283	0.347	40.837	19.216	-1.012
140	6.438	3.141	6.283	0.347	40.444	19.861	-1.066

## Appendix K Coordinates of stands for the initial layout plan

Table 12: Coordinates of stands for the initial layout plan. Integer  $-1$  in Columns **StandID** and **Charge** actually means that there is **NO** stand at that particular location.

standID	X	Y	charge
0	25.9754	16.6909	-0.444
1	26.0947	16.106	-0.698
2	26.0947	15.535	-0.501
3	26.0125	14.9698	-0.416
-1	25.8371	14.4576	-1.000
4	25.5923	13.9432	-0.754
5	25.3305	13.4876	-1.121
-1	24.9698	12.9823	-1.000
6	24.6543	12.6152	-0.613
7	24.2989	12.246	-0.219
8	23.9314	11.9047	-0.698
9	23.5566	11.6261	-0.980
10	23.145	11.3575	-1.177
11	22.7573	11.1175	-0.416
12	22.3373	10.9144	-0.839
13	21.9011	10.7276	-0.585
14	21.4973	10.5685	-1.008
15	20.9878	15.1472	-0.698
16	21.4644	17.337	-0.501
17	21.4644	16.8913	0.418
18	21.4644	16.4748	-0.477
19	21.4644	16.025	-0.964
20	21.4644	14.6932	-0.605
21	21.4644	17.7542	-1.066
-1	20.9878	15.6011	-1.000
22	21.4644	15.6011	-0.401
-1	21.4644	15.1472	-1.000
23	20.9878	17.7542	0.009
24	19.1208	9.9518	0.290
-1	18.7347	10.0897	-1.000
25	18.352	10.2201	-0.708
-1	17.9413	10.3888	-1.000
26	17.5603	10.5548	0.469
27	17.2588	12.0906	-0.401
-1	17.6326	12.0083	-1.000
28	17.9323	11.9947	2.120
29	18.8584	12.1399	1.566
30	19.2352	12.3266	1.878
-1	19.5499	12.5703	-1.000
31	19.8645	12.8386	1.601
32	21.014	11.177	1.462
-1	21.2979	11.2969	-1.000
33	21.5722	11.4127	1.150
34	21.8561	11.5326	1.497
-1	22.2441	11.6842	-1.000
35	22.5247	11.8116	2.086
36	22.7959	11.9347	2.016
37	20.8896	11.4672	1.358
38	21.1736	11.5871	1.601

Predictions on the Population Density and the Net Crowd Flow

39	21.4479	11.7029	1.705
40	21.7318	11.8229	0.942
41	22.1121	11.971	1.289
42	22.3927	12.0984	1.185
43	22.6639	12.2215	0.804
44	22.9445	12.349	1.220
45	23.0765	12.0621	0.769
46	24.342	14.5907	0.284
-1	24.342	15.0619	-1.000
47	23.1007	13.7432	1.012
-1	23.1007	14.2057	-1.000
-1	24.7698	14.1196	-1.000
48	24.7698	14.5907	0.596
49	24.7698	15.0619	1.012
-1	24.7698	15.533	-1.000
50	24.7698	16.0042	1.116
-1	22.6744	13.2808	-1.000
-1	22.6744	13.7432	-1.000
-1	22.6744	14.2057	-1.000
51	10.7923	11.6393	2.120
52	11.0054	11.1048	0.838
53	11.2746	10.5714	1.323
54	11.5312	10.0583	1.358
-1	11.8389	9.5682	-1.000
55	12.1908	9.0432	1.185
-1	9.6459	9.596	-1.000
56	12.5612	8.59	0.658
-1	9.2312	9.9481	-1.000
57	8.8488	10.2894	0.027
58	8.4402	10.6889	0.537
59	8.0617	11.0869	0.087
60	23.1007	13.2808	-0.364
61	19.7282	13.958	-0.184
62	19.4127	13.958	0.057
63	17.8843	13.958	-0.244
-1	17.5358	13.958	-1.000
-1	17.1881	13.958	-1.000
64	16.8396	13.958	0.507
65	16.4911	13.958	0.297
66	16.1433	13.958	0.237
67	19.8669	16.8995	0.147
68	19.8669	16.5771	0.477
69	19.8669	16.2548	1.169
70	20.9878	17.3065	1.319
71	20.9878	16.8771	0.507
72	20.9878	16.4648	0.868
73	20.9878	16.025	1.048
74	20.1918	16.2548	0.297
75	20.1918	16.5771	0.808
-1	20.1918	16.8995	-1.000
76	20.1918	14.6431	1.078
-1	20.1918	14.9655	-1.000
77	20.1918	15.2878	0.748

Predictions on the Population Density and the Net Crowd Flow

78	20.1918	15.6101	0.838
-1	20.1918	15.9325	-1.000
-1	19.8669	14.6431	-1.000
-1	19.8669	14.9655	-1.000
79	19.8669	15.2878	-0.033
80	19.8669	15.6101	0.237
81	19.8669	15.9325	0.253
82	17.167	18.0361	0.143
83	16.8607	17.8911	0.362
84	16.5382	17.7468	-0.158
85	16.2584	17.599	-0.459
86	15.937	17.4291	0.007
87	20.3587	13.958	-0.158
88	15.7948	13.958	0.253
89	20.0418	13.958	0.472
90	24.3496	16.0042	0.390
-1	24.3496	15.5331	-1.000
-1	24.3496	14.1196	-1.000
91	23.1007	14.6681	0.663
92	22.6744	14.6681	-0.021
93	20.3929	13.5369	0.636
94	20.1811	13.1701	0.527
95	9.6923	15.2651	-0.021
96	13.3303	16.7161	0.007
-1	12.7954	16.2812	-1.000
97	12.3299	15.9027	0.061
-1	11.8661	15.5257	-1.000
98	11.4005	15.1472	0.089
-1	8.834	12.7724	-1.000
99	9.3585	14.0929	0.171
100	8.747	14.7145	-0.240
-1	8.3909	15.7023	-1.000
-1	8.0627	16.3472	-1.000
-1	7.8306	17.643	-1.000
101	20.9878	14.6932	-0.267
102	8.2676	11.98	-0.267
103	19.7954	10.6412	-0.596
-1	23.8712	16.7128	-1.000
104	15.8448	14.5245	0.226
105	15.8448	14.9642	-0.075
106	15.8448	15.4039	-0.075
107	15.8448	15.8436	0.417
108	15.8448	16.2833	0.308
-1	15.8448	16.723	-1.000
109	16.2933	14.5245	-0.158
110	16.2933	14.9642	-0.158
-1	16.2933	15.4039	-1.000
-1	16.2933	15.8436	-1.000
111	16.2933	16.2833	0.007
112	16.2933	16.723	0.171
113	16.7421	14.5245	0.116
114	16.7421	14.9642	-0.048
115	16.7421	15.4039	0.007

-1	16.7421	15.8436	-1.000
116	16.7421	16.2833	-0.185
-1	16.7421	16.723	-1.000
117	17.191	14.5245	-1.178
118	17.191	14.9642	-1.205
119	17.191	15.4039	-1.936
-1	17.191	15.8436	-1.000
-1	17.191	16.2833	-1.000
-1	17.191	16.723	-1.000
120	17.6395	14.5245	-1.963
-1	17.6395	14.9642	-1.000
121	17.6395	15.4039	-2.207
122	17.6395	15.8436	-2.125
-1	17.6395	16.2833	-1.000
123	17.6395	16.723	-1.963
-1	18.0842	14.5245	-1.000
124	18.0842	14.9642	-1.990
125	18.0842	15.4039	-1.416
-1	18.0842	15.8436	-1.000
126	18.0842	16.2833	-2.129
127	18.0842	16.723	-1.438
-1	18.529	14.5245	-1.000
-1	18.529	14.9642	-1.000
128	18.529	15.4039	-1.222
129	18.529	15.8436	-1.071
130	18.529	16.2833	-1.287
-1	18.529	16.723	-1.000
131	18.9746	14.5245	-1.589
-1	18.9746	14.9642	-1.000
132	18.9746	15.4039	-0.682
-1	18.9746	15.8436	-1.000
133	18.9746	16.2833	-1.395
-1	18.9746	16.723	-1.000
134	15.4676	6.2612	-1.740
135	15.4676	6.7009	-1.589
136	15.4676	7.1406	-1.693
-1	15.4676	7.5803	-1.000
-1	15.4676	8.02	-1.000
-1	15.4676	8.4597	-1.000
137	15.9132	6.2612	-1.611
-1	15.9132	6.7009	-1.000
138	15.9132	7.1406	-1.016
-1	15.9132	7.5803	-1.000
139	15.9132	8.02	-1.070
-1	15.9132	8.4597	-1.000

## Appendix L Coordinates of stands for the optimal layout plan

Table 13: Coordinates of stands for the optimal layout plan. Integer  $-1$  in Columns **StandID** and **Charge** actually means that there is **NO** stand at that particular location.

standID	X	Y	charge
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-1	25.9754	16.6909	-1
-1	26.0947	16.106	-1
23	26.0947	15.535	0.009
86	26.0125	14.9698	0.007
-1	25.8371	14.4576	-1
-1	25.5923	13.9432	-1
99	25.3305	13.4876	0.171
-1	24.9698	12.9823	-1
-1	24.6543	12.6152	-1
-1	24.2989	12.246	-1
-1	23.9314	11.9047	-1
108	23.5566	11.6261	0.308
-1	23.145	11.3575	-1
111	22.7573	11.1175	0.007
-1	22.3373	10.9144	-1
-1	21.9011	10.7276	-1
-1	21.4973	10.5685	-1
-1	20.9878	15.1472	-1
46	21.4644	17.337	0.284
85	21.4644	16.8913	-0.459
17	21.4644	16.4748	0.418
0	21.4644	16.025	-0.444
-1	21.4644	14.6932	-1
84	21.4644	17.7542	-0.158
-1	20.9878	15.6011	-1
65	21.4644	15.6011	0.297
-1	21.4644	15.1472	-1
88	20.9878	17.7542	0.253
-1	19.1208	9.9518	-1
-1	18.7347	10.0897	-1
-1	18.352	10.2201	-1
-1	17.9413	10.3888	-1
-1	17.5603	10.5548	-1
24	17.2588	12.0906	0.290
13	17.6326	12.0083	-0.585
48	17.9323	11.9947	0.596
87	18.8584	12.1399	-0.158
92	19.2352	12.3266	-0.021
66	19.5499	12.5703	0.237
-1	19.8645	12.8386	-1
54	21.014	11.177	1.358
126	21.2979	11.2969	-2.129
51	21.5722	11.4127	2.120
119	21.8561	11.5326	-1.936
30	22.2441	11.6842	1.878
121	22.5247	11.8116	-2.207
35	22.7959	11.9347	2.086
127	20.8896	11.4672	-1.438
36	21.1736	11.5871	2.016
124	21.4479	11.7029	-1.990
38	21.7318	11.8229	1.601
123	22.1121	11.971	-1.963

Predictions on the Population Density and the Net Crowd Flow

28	22.3927	12.0984	2.120
122	22.6639	12.2215	-2.125
53	22.9445	12.349	1.323
131	23.0765	12.0621	-1.589
67	24.342	14.5907	0.147
-1	24.342	15.0619	-1
-1	23.1007	13.7432	-1
-1	23.1007	14.2057	-1
-1	24.7698	14.1196	-1
110	24.7698	14.5907	-0.158
-1	24.7698	15.0619	-1
105	24.7698	15.533	-0.075
57	24.7698	16.0042	0.027
98	22.6744	13.2808	0.089
-1	22.6744	13.7432	-1
-1	22.6744	14.2057	-1
97	10.7923	11.6393	0.061
-1	11.0054	11.1048	-1
-1	11.2746	10.5714	-1
-1	11.5312	10.0583	-1
95	11.8389	9.5682	-0.021
-1	12.1908	9.0432	-1
106	9.6459	9.596	-0.075
-1	12.5612	8.59	-1
-1	9.2312	9.9481	-1
-1	8.8488	10.2894	-1
81	8.4402	10.6889	0.253
61	8.0617	11.0869	-0.184
-1	23.1007	13.2808	-1
118	19.7282	13.958	-1.205
77	19.4127	13.958	0.748
11	17.8843	13.958	-0.416
49	17.5358	13.958	1.012
133	17.1881	13.958	-1.395
44	16.8396	13.958	1.220
128	16.4911	13.958	-1.222
76	16.1433	13.958	1.078
117	19.8669	16.8995	-1.178
37	19.8669	16.5771	1.358
125	19.8669	16.2548	-1.416
27	20.9878	17.3065	-0.401
64	20.9878	16.8771	0.507
3	20.9878	16.4648	-0.416
104	20.9878	16.025	0.226
29	20.1918	16.2548	1.566
136	20.1918	16.5771	-1.693
70	20.1918	16.8995	1.319
10	20.1918	14.6431	-1.177
32	20.1918	14.9655	1.462
137	20.1918	15.2878	-1.611
31	20.1918	15.6101	1.601
120	20.1918	15.9325	-1.963
55	19.8669	14.6431	1.185

Predictions on the Population Density and the Net Crowd Flow

135	19.8669	14.9655	-1.589
34	19.8669	15.2878	1.497
134	19.8669	15.6101	-1.740
39	19.8669	15.9325	1.705
26	17.167	18.0361	0.469
139	16.8607	17.8911	-1.070
41	16.5382	17.7468	1.289
130	16.2584	17.599	-1.287
43	15.937	17.4291	0.804
1	20.3587	13.958	-0.698
16	15.7948	13.958	-0.501
33	20.0418	13.958	1.150
-1	24.3496	16.0042	-1
-1	24.3496	15.5331	-1
59	24.3496	14.1196	0.087
-1	23.1007	14.6681	-1
-1	22.6744	14.6681	-1
82	20.3929	13.5369	0.143
-1	20.1811	13.1701	-1
-1	9.6923	15.2651	-1
-1	13.3303	16.7161	-1
-1	12.7954	16.2812	-1
-1	12.3299	15.9027	-1
115	11.8661	15.5257	0.007
-1	11.4005	15.1472	-1
114	8.834	12.7724	-0.048
-1	9.3585	14.0929	-1
-1	8.747	14.7145	-1
-1	8.3909	15.7023	-1
-1	8.0627	16.3472	-1
96	7.8306	17.643	0.007
112	20.9878	14.6932	0.171
-1	8.2676	11.98	-1
-1	19.7954	10.6412	-1
-1	23.8712	16.7128	-1
63	15.8448	14.5245	-0.244
94	15.8448	14.9642	0.527
103	15.8448	15.4039	-0.596
90	15.8448	15.8436	0.390
116	15.8448	16.2833	-0.185
100	15.8448	16.723	-0.240
89	16.2933	14.5245	0.472
12	16.2933	14.9642	-0.839
47	16.2933	15.4039	1.012
9	16.2933	15.8436	-0.980
45	16.2933	16.2833	0.769
101	16.2933	16.723	-0.267
2	16.7421	14.5245	-0.501
52	16.7421	14.9642	0.838
129	16.7421	15.4039	-1.071
40	16.7421	15.8436	0.942
8	16.7421	16.2833	-0.698
113	16.7421	16.723	0.116



Predictions on the Population Density and the Net Crowd Flow

93	17.191	14.5245	0.636
138	17.191	14.9642	-1.016
42	17.191	15.4039	1.185
14	17.191	15.8436	-1.008
75	17.191	16.2833	0.808
102	17.191	16.723	-0.267
20	17.6395	14.5245	-0.605
50	17.6395	14.9642	1.116
5	17.6395	15.4039	-1.121
73	17.6395	15.8436	1.048
15	17.6395	16.2833	-0.698
68	17.6395	16.723	0.477
71	18.0842	14.5245	0.507
4	18.0842	14.9642	-0.754
69	18.0842	15.4039	1.169
21	18.0842	15.8436	-1.066
56	18.0842	16.2833	0.658
22	18.0842	16.723	-0.401
25	18.529	14.5245	-0.708
91	18.529	14.9642	0.663
19	18.529	15.4039	-0.964
72	18.529	15.8436	0.868
6	18.529	16.2833	-0.613
107	18.529	16.723	0.417
83	18.9746	14.5245	0.362
18	18.9746	14.9642	-0.477
78	18.9746	15.4039	0.838
132	18.9746	15.8436	-0.682
58	18.9746	16.2833	0.537
7	18.9746	16.723	-0.219
-1	15.4676	6.2612	-1
-1	15.4676	6.7009	-1
-1	15.4676	7.1406	-1
74	15.4676	7.5803	0.297
109	15.4676	8.02	-0.158
79	15.4676	8.4597	-0.033
-1	15.9132	6.2612	-1
62	15.9132	6.7009	0.057
-1	15.9132	7.1406	-1
60	15.9132	7.5803	-0.364
80	15.9132	8.02	0.237
-1	15.9132	8.4597	-1