Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
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Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5

Inder J. Taneja[1]

Abstract

*During past years author worked with **block-wise borderedmagic squares** of even order blocks. It includes blocks of orders 4, 6, 8, 10, etc. Most of the cases are with equal sums magic squares. This type of work is an extension of classical bordered magic squares. In case of multiples of 4, the extension is made for **pandiagonal** magic squares [23]. For multiples of order 6 refer Taneja [24]. For the first time, we are presenting here bordered magic squares of odd number blocks. Recently, author worked on multiples of 3, based on different sums magic squares of order 3 [29]. This work is for borders of magic squares of order 5. It is done with two types of magic squares of order 5. One type is pandiagonal magic squares, and anotheras bordered magic squares. This work is up to order 40. Higher orders examples can be seen in **Excel file** attached with the work. The total work is up to order 150. **Pandiagonal** magic squares based on equal sums **pandiagonal** magic squares of order 5 are also included in the **Excel file**.*

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Contents

1 Introduction

During past years author [2, 3, 4, 5, 6, 7, 8] worked with **block-wise** magic squares from orders 12 to 47. Author [9, 10, 11, 12, 13, 14] also worked with **bordered** magic squares. The study on **bordered** magic squares is extended to **block-bordered** magic squares [15, 16, 17]. This is specially done for the magic squares of orders p and $2p$, where p is a prime number. This study is still extended to **block-wise bordered** magic squares [18, 19, 20, 21]. Some conection with Pythagorean triples and area-representations are also made [23, 24, 25, 26, 27]. The main property of **bordered** magic squares is that if we remove external borders, still we get **sub-bordered** magic squares, i.e., each layer in itself lead us to magic squares. In many cases, the properties of **bordered** magic square are seperated by **even** and **odd** orders magic squares. In many cases, we get good properties for the **even** order **bordered** magic squares. In some cases, we have to use fractional numbers to reach minimum perfect square sum of entries. For more study on **bordered** magic squares refer H. White's web-site [1].

The idea of bordered magic squares is already discussed by H. White's web-site [1] where the borders are of **single digits**. Borders multiples of even numbers starting from 4 are done extensively by author [23, 24, 25, 26, 27, 28].

Recently, for the first time, we presented bordered magic squares of odd number blocks. In case of multiples of 3, we worked with different sums magic squares of order 3 [29]. This work is for mutliples of 5, where we considered two types of magic squares of order 5. One **pandiagonal** and another is **bordered** magic squares of order 5. The procedure, how to get these **block-wise bordered** magic squares is also explained. **Pandiagonal** magic squares multiples of 5 are also given. This work is up to order 40. Higher orders examples can be seen in **Excel file** attached with this work. Before proceeding further, let's summarize, the idea of **block-wise bordered** magic squares:

1.1 Classification of Bordered Magic Squares

- **Single Digit:** Bordered magic squares based on single digit [9, 10, 1].
- **Two Digits:** Bordered magic squares based on magic rectangles multiples of 2 [57, 58, 59, 60, 60].
- **Three Digits:** Bordered magic squares based on magic squares of order 3 [29].
- **Four Digits:** Bordered magic squares based on magic squares of order 4 [23].
- **Five Digits:** Bordered magic squares based on magic squares of order 5 (This work)

For further even number multiples refer the following works of author:

- **Six Digits:** Bordered magic squares based on magic squares of order 6 [24].
- **Eight Digits:** Bordered magic squares based on magic squares of order 8 [25].
- **Ten Digits:** Bordered magic squares based on magic squares of order 10 [26].

- **Twelve Digits:** Bordered magic squares based on magic squares of order 12 [27].
- **Fourteen Digits:** Bordered magic squares based on magic squares of order 14 [28].

Let's see below the some examples of **block-wise bordered** magic squares multiples 5, where magic squares of order 5 are considered in two different ways.

2 Block-Wise Bordered Magic Squares

2.1 Magic Squares of Orders 35 and 40

Let's consider bordered magic square of orders 7 and 8 given by

7							175
44	38	40	5	4	2	42	175
11	34	30	15	14	32	39	175
9	19	28	21	26	31	41	175
7	17	23	25	27	33	43	175
47	37	24	29	22	13	3	175
49	18	20	35	36	16	1	175
8	12	10	45	46	48	6	175
175	175	175	175	175	175	175	175

8								260
8	2	62	64	51	13	53	7	260
5	46	44	17	50	18	20	60	260
6	16	31	36	25	38	49	59	260
11	22	26	37	32	35	43	54	260
61	24	40	27	34	29	41	4	260
56	42	33	30	39	28	23	9	260
55	45	21	48	15	47	19	10	260
58	63	3	1	14	52	12	57	260
260	260	260	260	260	260	260	260	260

The entries of above two magic squares are sequential numbers starting from 1:

$$D_{11\times 11} := \{1, 2, \ldots, 48, 49\}$$
$$D_{12\times 12} := \{1, 2, \ldots, 63, 64\}$$

These two magic squares are such that replacing the upper border still we are left with magic squares of sequential vales. Multiplying each entry by 25, we get

7							4375
1100	950	1000	125	100	50	1050	4375
275	850	750	375	350	800	975	4375
225	475	700	525	650	775	1025	4375
175	425	575	625	675	825	1075	4375
1175	925	600	725	550	325	75	4375
1225	450	500	875	900	400	25	4375
200	300	250	1125	1150	1200	150	4375
4375	4375	4375	4375	4375	4375	4375	4375

8								6500
200	50	1550	1600	1275	325	1325	175	6500
125	1150	1100	425	1250	450	500	1500	6500
150	400	775	900	625	950	1225	1475	6500
275	550	650	925	800	875	1075	1350	6500
1525	600	1000	675	850	725	1025	100	6500
1400	1050	825	750	975	700	575	225	6500
1375	1125	525	1200	375	1175	475	250	6500
1450	1575	75	25	350	1300	300	1425	6500
6500	6500	6500	6500	6500	6500	6500	6500	6500

The distributions of these two magic squares are given by

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$$D1_{7\times 7} := \{25, 50, \ldots, 1200, 1225\}$$
$$D1_{8\times 8} := \{25, 50, \ldots, 1575, 1600\}.$$

In both the cases the difference between entries is 25. Now in each case replace the entries by magic squares of order 5 formed by the entries as given below:

$$\begin{aligned} 25 &\rightarrow 1, 2, \ldots, 25 \\ 50 &\rightarrow 26, 27, \ldots, 50 \\ 75 &\rightarrow 51, 52, \ldots, 75 \\ \ldots &\rightarrow \ldots \quad \ldots \\ 1575 &\rightarrow 1551, 1552, \ldots, 1575 \\ 1600 &\rightarrow 1576, 1577 \ldots, 1600 \end{aligned}$$

This lead us to following two magic squares of orders 35 and 40.

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35																																				21455
	1100	1094	1088	1082	1076	950	944	938	932	926	1000	994	988	982	976	125	119	113	107	101	100	94	88	82	76	50	44	38	32	26	1050	1044	1038	1032	1026	21455
	1083	1077	1096	1095	1089	933	927	946	945	939	983	977	996	995	989	108	102	121	120	114	83	77	96	95	89	33	27	46	45	39	1033	1027	1046	1045	1039	21455
	1091	1090	1084	1078	1097	941	940	934	928	947	991	990	984	978	997	116	115	109	103	122	91	90	84	78	97	41	40	34	28	47	1041	1040	1034	1028	1047	21455
	1079	1098	1092	1086	1085	929	948	942	936	935	979	998	992	986	985	104	123	117	111	110	79	98	92	86	85	29	48	42	36	35	1029	1048	1042	1036	1035	21455
	1087	1081	1080	1099	1093	937	931	930	949	943	987	981	980	999	993	112	106	105	124	118	87	81	80	99	93	37	31	30	49	43	1037	1031	1030	1049	1043	21455
	275	269	263	257	251	850	844	838	832	826	750	744	738	732	726	375	369	363	357	351	350	344	338	332	326	800	794	788	782	776	975	969	963	957	951	21455
	258	252	271	270	264	833	827	846	845	839	733	727	746	745	739	358	352	371	370	364	333	327	346	345	339	783	777	796	795	789	958	952	971	970	964	21455
	266	265	259	253	272	841	840	834	828	847	741	740	734	728	747	366	365	359	353	372	341	340	334	328	347	791	790	784	778	797	966	965	959	953	972	21455
	254	273	267	261	260	829	848	842	836	835	729	748	742	736	735	354	373	367	361	360	329	348	342	336	335	779	798	792	786	785	954	973	967	961	960	21455
	262	256	255	274	268	837	831	830	849	843	737	731	730	749	743	362	356	355	374	368	337	331	330	349	343	787	781	780	799	793	962	956	955	974	968	21455
	225	219	213	207	201	475	469	463	457	451	700	694	688	682	676	525	519	513	507	501	650	644	638	632	626	775	769	763	757	751	1025	1019	1013	1007	1001	21455
	208	202	221	220	214	458	452	471	470	464	683	677	696	695	689	508	502	521	520	514	633	627	646	645	639	758	752	771	770	764	1008	1002	1021	1020	1014	21455
	216	215	209	203	222	466	465	459	453	472	691	690	684	678	697	516	515	509	503	522	641	640	634	628	647	766	765	759	753	772	1016	1015	1009	1003	1022	21455
	204	223	217	211	210	454	473	467	461	460	679	698	692	686	685	504	523	517	511	510	629	648	642	636	635	754	773	767	761	760	1004	1023	1017	1011	1010	21455
	212	206	205	224	218	462	456	455	474	468	687	681	680	699	693	512	506	505	524	518	637	631	630	649	643	762	756	755	774	768	1012	1006	1005	1024	1018	21455
	175	169	163	157	151	425	419	413	407	401	575	569	563	557	551	625	619	613	607	601	675	669	663	657	651	825	819	813	807	801	1075	1069	1063	1057	1051	21455
	158	152	171	170	164	408	402	421	420	414	558	552	571	570	564	608	602	621	620	614	658	652	671	670	664	808	802	821	820	814	1058	1052	1071	1070	1064	21455
	166	165	159	153	172	416	415	409	403	422	566	565	559	553	572	616	615	609	603	622	666	665	659	653	672	816	815	809	803	822	1066	1065	1059	1053	1072	21455
	154	173	167	161	160	404	423	417	411	410	554	573	567	561	560	604	623	617	611	610	654	673	667	661	660	804	823	817	811	810	1054	1073	1067	1061	1060	21455
	162	156	155	174	168	412	406	405	424	418	562	556	555	574	568	612	606	605	624	618	662	656	655	674	668	812	806	805	824	818	1062	1056	1055	1074	1068	21455
	1175	1169	1163	1157	1151	925	919	913	907	901	600	594	588	582	576	725	719	713	707	701	550	544	538	532	526	325	319	313	307	301	75	69	63	57	51	21455
	1158	1152	1171	1170	1164	908	902	921	920	914	583	577	596	595	589	708	702	721	720	714	533	527	546	545	539	308	302	321	320	314	58	52	71	70	64	21455
	1166	1165	1159	1153	1172	916	915	909	903	922	591	590	584	578	597	716	715	709	703	722	541	540	534	528	547	316	315	309	303	322	66	65	59	53	72	21455
	1154	1173	1167	1161	1160	904	923	917	911	910	579	598	592	586	585	704	723	717	711	710	529	548	542	536	535	304	323	317	311	310	54	73	67	61	60	21455
	1162	1156	1155	1174	1168	912	906	905	924	918	587	581	580	599	593	712	706	705	724	718	537	531	530	549	543	312	306	305	324	318	62	56	55	74	68	21455
	1225	1219	1213	1207	1201	450	444	438	432	426	500	494	488	482	476	875	869	863	857	851	900	894	888	882	876	400	394	388	382	376	25	19	13	7	1	21455
	1208	1202	1221	1220	1214	433	427	446	445	439	483	477	496	495	489	858	852	871	870	864	883	877	896	895	889	383	377	396	395	389	8	2	21	20	14	21455
	1216	1215	1209	1203	1222	441	440	434	428	447	491	490	484	478	497	866	865	859	853	872	891	890	884	878	897	391	390	384	378	397	16	15	9	3	22	21455
	1204	1223	1217	1211	1210	429	448	442	436	435	479	498	492	486	485	854	873	867	861	860	879	898	892	886	885	379	398	392	386	385	4	23	17	11	10	21455
	1212	1206	1205	1224	1218	437	431	430	449	443	487	481	480	499	493	862	856	855	874	868	887	881	880	899	893	387	381	380	399	393	12	6	5	24	18	21455
	200	194	188	182	176	300	294	288	282	276	250	244	238	232	226	1125	1119	1113	1107	1101	1150	1144	1138	1132	1126	1200	1194	1188	1182	1176	150	144	138	132	126	21455
	183	177	196	195	189	283	277	296	295	289	233	227	246	245	239	1108	1102	1121	1120	1114	1133	1127	1146	1145	1139	1183	1177	1196	1195	1189	133	127	146	145	139	21455
	191	190	184	178	197	291	290	284	278	297	241	240	234	228	247	1116	1115	1109	1103	1122	1141	1140	1134	1128	1147	1191	1190	1184	1178	1197	141	140	134	128	147	21455
	179	198	192	186	185	279	298	292	286	285	229	248	242	236	235	1104	1123	1117	1111	1110	1129	1148	1142	1136	1135	1179	1198	1192	1186	1185	129	148	142	136	135	21455
	187	181	180	199	193	287	281	280	299	293	237	231	230	249	243	1112	1106	1105	1124	1118	1137	1131	1130	1149	1143	1187	1181	1180	1199	1193	137	131	130	149	143	21455
	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455

35																																			21455
1079	1076	1096	1094	1095	929	926	946	944	945	979	976	996	994	995	104	101	121	119	120	79	76	96	94	95	29	26	46	44	45	1029	1026	1046	1044	1045	21455
1099	1089	1084	1091	1077	949	939	934	941	927	999	989	984	991	977	124	114	109	116	102	99	89	84	91	77	49	39	34	41	27	1049	1039	1034	1041	1027	21455
1098	1090	1088	1086	1078	948	940	938	936	928	998	990	988	986	978	123	115	113	111	103	98	90	88	86	78	48	40	38	36	28	1048	1040	1038	1036	1028	21455
1083	1085	1092	1087	1093	933	935	942	937	943	983	985	992	987	993	108	110	117	112	118	83	85	92	87	93	33	35	42	37	43	1033	1035	1042	1037	1043	21455
1081	1100	1080	1082	1097	931	950	930	932	947	981	1000	980	982	997	106	125	105	107	122	81	100	80	82	97	31	50	30	32	47	1031	1050	1030	1032	1047	21455
254	251	271	269	270	829	826	846	844	845	729	726	746	744	745	354	351	371	369	370	329	326	346	344	345	779	776	796	794	795	954	951	971	969	970	21455
274	264	259	266	252	849	839	834	841	827	749	739	734	741	727	374	364	359	366	352	349	339	334	341	327	799	789	784	791	777	974	964	959	966	952	21455
273	265	263	261	253	848	840	838	836	828	748	740	738	736	728	373	365	363	361	353	348	340	338	336	328	798	790	788	786	778	973	965	963	961	953	21455
258	260	267	262	268	833	835	842	837	843	733	735	742	737	743	358	360	367	362	368	333	335	342	337	343	783	785	792	787	793	958	960	967	962	968	21455
256	275	255	257	272	831	850	830	832	847	731	750	730	732	747	356	375	355	357	372	331	350	330	332	347	781	800	780	782	797	956	975	955	957	972	21455
204	201	221	219	220	454	451	471	469	470	679	676	696	694	695	504	501	521	519	520	629	626	646	644	645	754	751	771	769	770	1004	1001	1021	1019	1020	21455
224	214	209	216	202	474	464	459	466	452	699	689	684	691	677	524	514	509	516	502	649	639	634	641	627	774	764	759	766	752	1024	1014	1009	1016	1002	21455
223	215	213	211	203	473	465	463	461	453	698	690	688	686	678	523	515	513	511	503	648	640	638	636	628	773	765	763	761	753	1023	1015	1013	1011	1003	21455
208	210	217	212	218	458	460	467	462	468	683	685	692	687	693	508	510	517	512	518	633	635	642	637	643	758	760	767	762	768	1008	1010	1017	1012	1018	21455
206	225	205	207	222	456	475	455	457	472	681	700	680	682	697	506	525	505	507	522	631	650	630	632	647	756	775	755	757	772	1006	1025	1005	1007	1022	21455
154	151	171	169	170	404	401	421	419	420	554	551	571	569	570	604	601	621	619	620	654	651	671	669	670	804	801	821	819	820	1054	1051	1071	1069	1070	21455
174	164	159	166	152	424	414	409	416	402	574	564	559	566	552	624	614	609	616	602	674	664	659	666	652	824	814	809	816	802	1074	1064	1059	1066	1052	21455
173	165	163	161	153	423	415	413	411	403	573	565	563	561	553	623	615	613	611	603	673	665	663	661	653	823	815	813	811	803	1073	1065	1063	1061	1053	21455
158	160	167	162	168	408	410	417	412	418	558	560	567	562	568	608	610	617	612	618	658	660	667	662	668	808	810	817	812	818	1058	1060	1067	1062	1068	21455
156	175	155	157	172	406	425	405	407	422	556	575	555	557	572	606	625	605	607	622	656	675	655	657	672	806	825	805	807	822	1056	1075	1055	1057	1072	21455
1154	1151	1171	1169	1170	904	901	921	919	920	579	576	596	594	595	704	701	721	719	720	529	526	546	544	545	304	301	321	319	320	54	51	71	69	70	21455
1174	1164	1159	1166	1152	924	914	909	916	902	599	589	584	591	577	724	714	709	716	702	549	539	534	541	527	324	314	309	316	302	74	64	59	66	52	21455
1173	1165	1163	1161	1153	923	915	913	911	903	598	590	588	586	578	723	715	713	711	703	548	540	538	536	528	323	315	313	311	303	73	65	63	61	53	21455
1158	1160	1167	1162	1168	908	910	917	912	918	583	585	592	587	593	708	710	717	712	718	533	535	542	537	543	308	310	317	312	318	58	60	67	62	68	21455
1156	1175	1155	1157	1172	906	925	905	907	922	581	600	580	582	597	706	725	705	707	722	531	550	530	532	547	306	325	305	307	322	56	75	55	57	72	21455
1204	1201	1221	1219	1220	429	426	446	444	445	479	476	496	494	495	854	851	871	869	870	879	876	896	894	895	379	376	396	394	395	4	1	21	19	20	21455
1224	1214	1209	1216	1202	449	439	434	441	427	499	489	484	491	477	874	864	859	866	852	899	889	884	891	877	399	389	384	391	377	24	14	9	16	2	21455
1223	1215	1213	1211	1203	448	440	438	436	428	498	490	488	486	478	873	865	863	861	853	898	890	888	886	878	398	390	388	386	378	23	15	13	11	3	21455
1208	1210	1217	1212	1218	433	435	442	437	443	483	485	492	487	493	858	860	867	862	868	883	885	892	887	893	383	385	392	387	393	8	10	17	12	18	21455
1206	1225	1205	1207	1222	431	450	430	432	447	481	500	480	482	497	856	875	855	857	872	881	900	880	882	897	381	400	380	382	397	6	25	5	7	22	21455
179	176	196	194	195	279	276	296	294	295	229	226	246	244	245	1104	1101	1121	1119	1120	1129	1126	1146	1144	1145	1179	1176	1196	1194	1195	129	126	146	144	145	21455
199	189	184	191	177	299	289	284	291	277	249	239	234	241	227	1124	1114	1109	1116	1102	1149	1139	1134	1141	1127	1199	1189	1184	1191	1177	149	139	134	141	127	21455
198	190	188	186	178	298	290	288	286	278	248	240	238	236	228	1123	1115	1113	1111	1103	1148	1140	1138	1136	1128	1198	1190	1188	1186	1178	148	140	138	136	128	21455
183	185	192	187	193	283	285	292	287	293	233	235	242	237	243	1108	1110	1117	1112	1118	1133	1135	1142	1137	1143	1183	1185	1192	1187	1193	133	135	142	137	143	21455
181	200	180	182	197	281	300	280	282	297	231	250	230	232	247	1106	1125	1105	1107	1122	1131	1150	1130	1132	1147	1181	1200	1180	1182	1197	131	150	130	132	147	21455
21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455

Above two magic squares of order 35 formed by blocks of magic squares of order 5 are with sequential entries:

$$D_{35\times35} := \{1, 2, \ldots, 1224, 1225\}$$

Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
Zenodo, May 06, 2023, pp. 1-31, https://doi.org/10.5281/zenodo.7903412

40																																								32020
200	194	188	182	176	50	44	38	32	26	1550	1544	1538	1532	1526	1600	1594	1588	1582	1576	1275	1269	1263	1257	1251	325	319	313	307	301	1325	1319	1313	1307	1301	175	169	163	157	151	32020
183	177	196	195	189	33	27	46	45	39	1533	1527	1546	1545	1539	1583	1577	1596	1595	1589	1258	1252	1271	1270	1264	308	302	321	320	314	1308	1302	1321	1320	1314	158	152	171	170	164	32020
191	190	184	178	197	41	40	34	28	47	1541	1540	1534	1528	1547	1591	1590	1584	1578	1597	1266	1265	1259	1253	1272	316	315	309	303	322	1316	1315	1309	1303	1322	166	165	159	153	172	32020
179	198	192	186	185	29	48	42	36	35	1529	1548	1542	1536	1535	1579	1598	1592	1586	1585	1254	1273	1267	1261	1260	304	323	317	311	310	1304	1323	1317	1311	1310	154	173	167	161	160	32020
187	181	180	199	193	37	31	30	49	43	1537	1531	1530	1549	1543	1587	1581	1580	1599	1593	1262	1256	1255	1274	1268	312	306	305	324	318	1312	1306	1305	1324	1318	162	156	155	174	168	32020
125	119	113	107	101	1150	1144	1138	1132	1126	1100	1094	1088	1082	1076	425	419	413	407	401	1250	1244	1238	1232	1226	450	444	438	432	426	500	494	488	482	476	1500	1494	1488	1482	1476	32020
108	102	121	120	114	1133	1127	1146	1145	1139	1083	1077	1096	1095	1089	408	402	421	420	414	1233	1227	1246	1245	1239	433	427	446	445	439	483	477	496	495	489	1483	1477	1496	1495	1489	32020
116	115	109	103	122	1141	1140	1134	1128	1147	1091	1090	1084	1078	1097	416	415	409	403	422	1241	1240	1234	1228	1247	441	440	434	428	447	491	490	484	478	497	1491	1490	1484	1478	1497	32020
104	123	117	111	110	1129	1148	1142	1136	1135	1079	1098	1092	1086	1085	404	423	417	411	410	1229	1248	1242	1236	1235	429	448	442	436	435	479	498	492	486	485	1479	1498	1492	1486	1485	32020
112	106	105	124	118	1137	1131	1130	1149	1143	1087	1081	1080	1099	1093	412	406	405	424	418	1237	1231	1230	1249	1243	437	431	430	449	443	487	481	480	499	493	1487	1481	1480	1499	1493	32020
150	144	138	132	126	400	394	388	382	376	775	769	763	757	751	900	894	888	882	876	625	619	613	607	601	950	944	938	932	926	1225	1219	1213	1207	1201	1475	1469	1463	1457	1451	32020
133	127	146	145	139	383	377	396	395	389	758	752	771	770	764	883	877	896	895	889	608	602	621	620	614	933	927	946	945	939	1208	1202	1221	1220	1214	1458	1452	1471	1470	1464	32020
141	140	134	128	147	391	390	384	378	397	766	765	759	753	772	891	890	884	878	897	616	615	609	603	622	941	940	934	928	947	1216	1215	1209	1203	1222	1466	1465	1459	1453	1472	32020
129	148	142	136	135	379	398	392	386	385	754	773	767	761	760	879	898	892	886	885	604	623	617	611	610	929	948	942	936	935	1204	1223	1217	1211	1210	1454	1473	1467	1461	1460	32020
137	131	130	149	143	387	381	380	399	393	762	756	755	774	768	887	881	880	899	893	612	606	605	624	618	937	931	930	949	943	1212	1206	1205	1224	1218	1462	1456	1455	1474	1468	32020
275	269	263	257	251	550	544	538	532	526	650	644	638	632	626	925	919	913	907	901	800	794	788	782	776	875	869	863	857	851	1075	1069	1063	1057	1051	1350	1344	1338	1332	1326	32020
258	252	271	270	264	533	527	546	545	539	633	627	646	645	639	908	902	921	920	914	783	777	796	795	789	858	852	871	870	864	1058	1052	1071	1070	1064	1333	1327	1346	1345	1339	32020
266	265	259	253	272	541	540	534	528	547	641	640	634	628	647	916	915	909	903	922	791	790	784	778	797	866	865	859	853	872	1066	1065	1059	1053	1072	1341	1340	1334	1328	1347	32020
254	273	267	261	260	529	548	542	536	535	629	648	642	636	635	904	923	917	911	910	779	798	792	786	785	854	873	867	861	860	1054	1073	1067	1061	1060	1329	1348	1342	1336	1335	32020
262	256	255	274	268	537	531	530	549	543	637	631	630	649	643	912	906	905	924	918	787	781	780	799	793	862	856	855	874	868	1062	1056	1055	1074	1068	1337	1331	1330	1349	1343	32020
1525	1519	1513	1507	1501	600	594	588	582	576	1000	994	988	982	976	675	669	663	657	651	850	844	838	832	826	725	719	713	707	701	1025	1019	1013	1007	1001	100	94	88	82	76	32020
1508	1502	1521	1520	1514	583	577	596	595	589	983	977	996	995	989	658	652	671	670	664	833	827	846	845	839	708	702	721	720	714	1008	1002	1021	1020	1014	83	77	96	95	89	32020
1516	1515	1509	1503	1522	591	590	584	578	597	991	990	984	978	997	666	665	659	653	672	841	840	834	828	847	716	715	709	703	722	1016	1015	1009	1003	1022	91	90	84	78	97	32020
1504	1523	1517	1511	1510	579	598	592	586	585	979	998	992	986	985	654	673	667	661	660	829	848	842	836	835	704	723	717	711	710	1004	1023	1017	1011	1010	79	98	92	86	85	32020
1512	1506	1505	1524	1518	587	581	580	599	593	987	981	980	999	993	662	656	655	674	668	837	831	830	849	843	712	706	705	724	718	1012	1006	1005	1024	1018	87	81	80	99	93	32020
1400	1394	1388	1382	1376	1050	1044	1038	1032	1026	825	819	813	807	801	750	744	738	732	726	975	969	963	957	951	700	694	688	682	676	575	569	563	557	551	225	219	213	207	201	32020
1383	1377	1396	1395	1389	1033	1027	1046	1045	1039	808	802	821	820	814	733	727	746	745	739	958	952	971	970	964	683	677	696	695	689	558	552	571	570	564	208	202	221	220	214	32020
1391	1390	1384	1378	1397	1041	1040	1034	1028	1047	816	815	809	803	822	741	740	734	728	747	966	965	959	953	972	691	690	684	678	697	566	565	559	553	572	216	215	209	203	222	32020
1379	1398	1392	1386	1385	1029	1048	1042	1036	1035	804	823	817	811	810	729	748	742	736	735	954	973	967	961	960	679	698	692	686	685	554	573	567	561	560	204	223	217	211	210	32020
1387	1381	1380	1399	1393	1037	1031	1030	1049	1043	812	806	805	824	818	737	731	730	749	743	962	956	955	974	968	687	681	680	699	693	562	556	555	574	568	212	206	205	224	218	32020
1375	1369	1363	1357	1351	1125	1119	1113	1107	1101	525	519	513	507	501	1200	1194	1188	1182	1176	375	369	363	357	351	1175	1169	1163	1157	1151	475	469	463	457	451	250	244	238	232	226	32020
1358	1352	1371	1370	1364	1108	1102	1121	1120	1114	508	502	521	520	514	1183	1177	1196	1195	1189	358	352	371	370	364	1158	1152	1171	1170	1164	458	452	471	470	464	233	227	246	245	239	32020
1366	1365	1359	1353	1372	1116	1115	1109	1103	1122	516	515	509	503	522	1191	1190	1184	1178	1197	366	365	359	353	372	1166	1165	1159	1153	1172	466	465	459	453	472	241	240	234	228	247	32020
1354	1373	1367	1361	1360	1104	1123	1117	1111	1110	504	523	517	511	510	1179	1198	1192	1186	1185	354	373	367	361	360	1154	1173	1167	1161	1160	454	473	467	461	460	229	248	242	236	235	32020
1362	1356	1355	1374	1368	1112	1106	1105	1124	1118	512	506	505	524	518	1187	1181	1180	1199	1193	362	356	355	374	368	1162	1156	1155	1174	1168	462	456	455	474	468	237	231	230	249	243	32020
1450	1444	1438	1432	1426	1575	1569	1563	1557	1551	75	69	63	57	51	25	19	13	7	1	350	344	338	332	326	1300	1294	1288	1282	1276	300	294	288	282	276	1425	1419	1413	1407	1401	32020
1433	1427	1446	1445	1439	1558	1552	1571	1570	1564	58	52	71	70	64	8	2	21	20	14	333	327	346	345	339	1283	1277	1296	1295	1289	283	277	296	295	289	1408	1402	1421	1420	1414	32020
1441	1440	1434	1428	1447	1566	1565	1559	1553	1572	66	65	59	53	72	16	15	9	3	22	341	340	334	328	347	1291	1290	1284	1278	1297	291	290	284	278	297	1416	1415	1409	1403	1422	32020
1429	1448	1442	1436	1435	1554	1573	1567	1561	1560	54	73	67	61	60	4	23	17	11	10	329	348	342	336	335	1279	1298	1292	1286	1285	279	298	292	286	285	1404	1423	1417	1411	1410	32020
1437	1431	1430	1449	1443	1562	1556	1555	1574	1568	62	56	55	74	68	12	6	5	24	18	337	331	330	349	343	1287	1281	1280	1299	1293	287	281	280	299	293	1412	1406	1405	1424	1418	32020
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Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
Zenodo, May 06, 2023, pp. 1-31, *https://doi.org/10.5281/zenodo.7903412*

40																																								32020
179	176	196	194	195	29	26	46	44	45	1529	1526	1546	1544	1545	1579	1576	1596	1594	1595	1254	1251	1271	1269	1270	304	301	321	319	320	1304	1301	1321	1319	1320	154	151	171	169	170	32020
199	189	184	191	177	49	39	34	41	27	1549	1539	1534	1541	1527	1599	1589	1584	1591	1577	1274	1264	1259	1266	1252	324	314	309	316	302	1324	1314	1309	1316	1302	174	164	159	166	152	32020
198	190	188	186	178	48	40	38	36	28	1548	1540	1538	1536	1528	1598	1590	1588	1586	1578	1273	1265	1263	1261	1253	323	315	313	311	303	1323	1315	1313	1311	1303	173	165	163	161	153	32020
183	185	192	187	193	33	35	42	37	43	1533	1535	1542	1537	1543	1583	1585	1592	1587	1593	1258	1260	1267	1262	1268	308	310	317	312	318	1308	1310	1317	1312	1318	158	160	167	162	168	32020
181	200	180	182	197	31	50	30	32	47	1531	1550	1530	1532	1547	1581	1600	1580	1582	1597	1256	1275	1255	1257	1272	306	325	305	307	322	1306	1325	1305	1307	1322	156	175	155	157	172	32020
104	101	121	119	120	1129	1126	1146	1144	1145	1079	1076	1096	1094	1095	404	401	421	419	420	1229	1226	1246	1244	1245	429	426	446	444	445	479	476	496	494	495	1479	1476	1496	1494	1495	32020
124	114	109	116	102	1149	1139	1134	1141	1127	1099	1089	1084	1091	1077	424	414	409	416	402	1249	1239	1234	1241	1227	449	439	434	441	427	499	489	484	491	477	1499	1489	1484	1491	1477	32020
123	115	113	111	103	1148	1140	1138	1136	1128	1098	1090	1088	1086	1078	423	415	413	411	403	1248	1240	1238	1236	1228	448	440	438	436	428	498	490	488	486	478	1498	1490	1488	1486	1478	32020
108	110	117	112	118	1133	1135	1142	1137	1143	1083	1085	1092	1087	1093	408	410	417	412	418	1233	1235	1242	1237	1243	433	435	442	437	443	483	485	492	487	493	1483	1485	1492	1487	1493	32020
106	125	105	107	122	1131	1150	1130	1132	1147	1081	1100	1080	1082	1097	406	425	405	407	422	1231	1250	1230	1232	1247	431	450	430	432	447	481	500	480	482	497	1481	1500	1480	1482	1497	32020
129	126	146	144	145	379	376	396	394	395	754	751	771	769	770	879	876	896	894	895	604	601	621	619	620	929	926	946	944	945	1204	1201	1221	1219	1220	1454	1451	1471	1469	1470	32020
149	139	134	141	127	399	389	384	391	377	774	764	759	766	752	899	889	884	891	877	624	614	609	616	602	949	939	934	941	927	1224	1214	1209	1216	1202	1474	1464	1459	1466	1452	32020
148	140	138	136	128	398	390	388	386	378	773	765	763	761	753	898	890	888	886	878	623	615	613	611	603	948	940	938	936	928	1223	1215	1213	1211	1203	1473	1465	1463	1461	1453	32020
133	135	142	137	143	383	385	392	387	393	758	760	767	762	768	883	885	892	887	893	608	610	617	612	618	933	935	942	937	943	1208	1210	1217	1212	1218	1458	1460	1467	1462	1468	32020
131	150	130	132	147	381	400	380	382	397	756	775	755	757	772	881	900	880	882	897	606	625	605	607	622	931	950	930	932	947	1206	1225	1205	1207	1222	1456	1475	1455	1457	1472	32020
254	251	271	269	270	529	526	546	544	545	629	626	646	644	645	904	901	921	919	920	779	776	796	794	795	854	851	871	869	870	1054	1051	1071	1069	1070	1329	1326	1346	1344	1345	32020
274	264	259	266	252	549	539	534	541	527	649	639	634	641	627	924	914	909	916	902	799	789	784	791	777	874	864	859	866	852	1074	1064	1059	1066	1052	1349	1339	1334	1341	1327	32020
273	265	263	261	253	548	540	538	536	528	648	640	638	636	628	923	915	913	911	903	798	790	788	786	778	873	865	863	861	853	1073	1065	1063	1061	1053	1348	1340	1338	1336	1328	32020
258	260	267	262	268	533	535	542	537	543	633	635	642	637	643	908	910	917	912	918	783	785	792	787	793	858	860	867	862	868	1058	1060	1067	1062	1068	1333	1335	1342	1337	1343	32020
256	275	255	257	272	531	550	530	532	547	631	650	630	632	647	906	925	905	907	922	781	800	780	782	797	856	875	855	857	872	1056	1075	1055	1057	1072	1331	1350	1330	1332	1347	32020
1504	1501	1521	1519	1520	579	576	596	594	595	979	976	996	994	995	654	651	671	669	670	829	826	846	844	845	704	701	721	719	720	1004	1001	1021	1019	1020	79	76	96	94	95	32020
1524	1514	1509	1516	1502	599	589	584	591	577	999	989	984	991	977	674	664	659	666	652	849	839	834	841	827	724	714	709	716	702	1024	1014	1009	1016	1002	99	89	84	91	77	32020
1523	1515	1513	1511	1503	598	590	588	586	578	998	990	988	986	978	673	665	663	661	653	848	840	838	836	828	723	715	713	711	703	1023	1015	1013	1011	1003	98	90	88	86	78	32020
1508	1510	1517	1512	1518	583	585	592	587	593	983	985	992	987	993	658	660	667	662	668	833	835	842	837	843	708	710	717	712	718	1008	1010	1017	1012	1018	83	85	92	87	93	32020
1506	1525	1505	1507	1522	581	600	580	582	597	981	1000	980	982	997	656	675	655	657	672	831	850	830	832	847	706	725	705	707	722	1006	1025	1005	1007	1022	81	100	80	82	97	32020
1379	1376	1396	1394	1395	1029	1026	1046	1044	1045	804	801	821	819	820	729	726	746	744	745	954	951	971	969	970	679	676	696	694	695	554	551	571	569	570	204	201	221	219	220	32020
1399	1389	1384	1391	1377	1049	1039	1034	1041	1027	824	814	809	816	802	749	739	734	741	727	974	964	959	966	952	699	689	684	691	677	574	564	559	566	552	224	214	209	216	202	32020
1398	1390	1388	1386	1378	1048	1040	1038	1036	1028	823	815	813	811	803	748	740	738	736	728	973	965	963	961	953	698	690	688	686	678	573	565	563	561	553	223	215	213	211	203	32020
1383	1385	1392	1387	1393	1033	1035	1042	1037	1043	808	810	817	812	818	733	735	742	737	743	958	960	967	962	968	683	685	692	687	693	558	560	567	562	568	208	210	217	212	218	32020
1381	1400	1380	1382	1397	1031	1050	1030	1032	1047	806	825	805	807	822	731	750	730	732	747	956	975	955	957	972	681	700	680	682	697	556	575	555	557	572	206	225	205	207	222	32020
1354	1351	1371	1369	1370	1104	1101	1121	1119	1120	504	501	521	519	520	1179	1176	1196	1194	1195	354	351	371	369	370	1154	1151	1171	1169	1170	454	451	471	469	470	229	226	246	244	245	32020
1374	1364	1359	1366	1352	1124	1114	1109	1116	1102	524	514	509	516	502	1199	1189	1184	1191	1177	374	364	359	366	352	1174	1164	1159	1166	1152	474	464	459	466	452	249	239	234	241	227	32020
1373	1365	1363	1361	1353	1123	1115	1113	1111	1103	523	515	513	511	503	1198	1190	1188	1186	1178	373	365	363	361	353	1173	1165	1163	1161	1153	473	465	463	461	453	248	240	238	236	228	32020
1358	1360	1367	1362	1368	1108	1110	1117	1112	1118	508	510	517	512	518	1183	1185	1192	1187	1193	358	360	367	362	368	1158	1160	1167	1162	1168	458	460	467	462	468	233	235	242	237	243	32020
1356	1375	1355	1357	1372	1106	1125	1105	1107	1122	506	525	505	507	522	1181	1200	1180	1182	1197	356	375	355	357	372	1156	1175	1155	1157	1172	456	475	455	457	472	231	250	230	232	247	32020
1429	1426	1446	1444	1445	1554	1551	1571	1569	1570	54	51	71	69	70	4	1	21	19	20	329	326	346	344	345	1279	1276	1296	1294	1295	279	276	296	294	295	1404	1401	1421	1419	1420	32020
1449	1439	1434	1441	1427	1574	1564	1559	1566	1552	74	64	59	66	52	24	14	9	16	2	349	339	334	341	327	1299	1289	1284	1291	1277	299	289	284	291	277	1424	1414	1409	1416	1402	32020
1448	1440	1438	1436	1428	1573	1565	1563	1561	1553	73	65	63	61	53	23	15	13	11	3	348	340	338	336	328	1298	1290	1288	1286	1278	298	290	288	286	278	1423	1415	1413	1411	1403	32020
1433	1435	1442	1437	1443	1558	1560	1567	1562	1568	58	60	67	62	68	8	10	17	12	18	333	335	342	337	343	1283	1285	1292	1287	1293	283	285	292	287	293	1408	1410	1417	1412	1418	32020
1431	1450	1430	1432	1447	1556	1575	1555	1557	1572	56	75	55	57	72	6	25	5	7	22	331	350	330	332	347	1281	1300	1280	1282	1297	281	300	280	282	297	1406	1425	1405	1407	1422	32020
32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020

Above two magic squares of order 40 formed by blocks of magic squares of order 5 are with sequential entries:

$$D_{40\times 40} := \{1, 2, \dots, 1599, 1600\}.$$

These four magic squares are bordered magic squares with border made by **pandiagonal** and **bordered** magic squares of order 5. If you remove the external borders, still we are left with magic squares of lower orders. Let's see how it works.

2.2 Magic Squares of Order 30

These magic squares are obtained from above by the application of the formula $\frac{a^2-b^2}{2}, a > b$. Removing the external border of order 5 and then subtracting $\frac{40^2-30^2}{2} := 350$ from magic squares of orders 40, we get magic squares of orders 30 given by

Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
Zenodo, May 06, 2023, pp. 1-31, *https://doi.org/10.5281/zenodo.7903412*

30																															13515
	800	794	788	782	776	750	744	738	732	726	75	69	63	57	51	900	894	888	882	876	100	94	88	82	76	150	144	138	132	126	13515
	783	777	796	795	789	733	727	746	745	739	58	52	71	70	64	883	877	896	895	889	83	77	96	95	89	133	127	146	145	139	13515
	791	790	784	778	797	741	740	734	728	747	66	65	59	53	72	891	890	884	878	897	91	90	84	78	97	141	140	134	128	147	13515
	779	798	792	786	785	729	748	742	736	735	54	73	67	61	60	879	898	892	886	885	79	98	92	86	85	129	148	142	136	135	13515
	787	781	780	799	793	737	731	730	749	743	62	56	55	74	68	887	881	880	899	893	87	81	80	99	93	137	131	130	149	143	13515
	50	44	38	32	26	425	419	413	407	401	550	544	538	532	526	275	269	263	257	251	600	594	588	582	576	875	869	863	857	851	13515
	33	27	46	45	39	408	402	421	420	414	533	527	546	545	539	258	252	271	270	264	583	577	596	595	589	858	852	871	870	864	13515
	41	40	34	28	47	416	415	409	403	422	541	540	534	528	547	266	265	259	253	272	591	590	584	578	597	866	865	859	853	872	13515
	29	48	42	36	35	404	423	417	411	410	529	548	542	536	535	254	273	267	261	260	579	598	592	586	585	854	873	867	861	860	13515
	37	31	30	49	43	412	406	405	424	418	537	531	530	549	543	262	256	255	274	268	587	581	580	599	593	862	856	855	874	868	13515
	200	194	188	182	176	300	294	288	282	276	575	569	563	557	551	450	444	438	432	426	525	519	513	507	501	725	719	713	707	701	13515
	183	177	196	195	189	283	277	296	295	289	558	552	571	570	564	433	427	446	445	439	508	502	521	520	514	708	702	721	720	714	13515
	191	190	184	178	197	291	290	284	278	297	566	565	559	553	572	441	440	434	428	447	516	515	509	503	522	716	715	709	703	722	13515
	179	198	192	186	185	279	298	292	286	285	554	573	567	561	560	429	448	442	436	435	504	523	517	511	510	704	723	717	711	710	13515
	187	181	180	199	193	287	281	280	299	293	562	556	555	574	568	437	431	430	449	443	512	506	505	524	518	712	706	705	724	718	13515
	250	244	238	232	226	650	644	638	632	626	325	319	313	307	301	500	494	488	482	476	375	369	363	357	351	675	669	663	657	651	13515
	233	227	246	245	239	633	627	646	645	639	308	302	321	320	314	483	477	496	495	489	358	352	371	370	364	658	652	671	670	664	13515
	241	240	234	228	247	641	640	634	628	647	316	315	309	303	322	491	490	484	478	497	366	365	359	353	372	666	665	659	653	672	13515
	229	248	242	236	235	629	648	642	636	635	304	323	317	311	310	479	498	492	486	485	354	373	367	361	360	654	673	667	661	660	13515
	237	231	230	249	243	637	631	630	649	643	312	306	305	324	318	487	481	480	499	493	362	356	355	374	368	662	656	655	674	668	13515
	700	694	688	682	676	475	469	463	457	451	400	394	388	382	376	625	619	613	607	601	350	344	338	332	326	225	219	213	207	201	13515
	683	677	696	695	689	458	452	471	470	464	383	377	396	395	389	608	602	621	620	614	333	327	346	345	339	208	202	221	220	214	13515
	691	690	684	678	697	466	465	459	453	472	391	390	384	378	397	616	615	609	603	622	341	340	334	328	347	216	215	209	203	222	13515
	679	698	692	686	685	454	473	467	461	460	379	398	392	386	385	604	623	617	611	610	329	348	342	336	335	204	223	217	211	210	13515
	687	681	680	699	693	462	456	455	474	468	387	381	380	399	393	612	606	605	624	618	337	331	330	349	343	212	206	205	224	218	13515
	775	769	763	757	751	175	169	163	157	151	850	844	838	832	826	25	19	13	7	1	825	819	813	807	801	125	119	113	107	101	13515
	758	752	771	770	764	158	152	171	170	164	833	827	846	845	839	8	2	21	20	14	808	802	821	820	814	108	102	121	120	114	13515
	766	765	759	753	772	166	165	159	153	172	841	840	834	828	847	16	15	9	3	22	816	815	809	803	822	116	115	109	103	122	13515
	754	773	767	761	760	154	173	167	161	160	829	848	842	836	835	4	23	17	11	10	804	823	817	811	810	104	123	117	111	110	13515
	762	756	755	774	768	162	156	155	174	168	837	831	830	849	843	12	6	5	24	18	812	806	805	824	818	112	106	105	124	118	13515
	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515

30																															13515
	779	776	796	794	795	729	726	746	744	745	54	51	71	69	70	879	876	896	894	895	79	76	96	94	95	129	126	146	144	145	13515
	799	789	784	791	777	749	739	734	741	727	74	64	59	66	52	899	889	884	891	877	99	89	84	91	77	149	139	134	141	127	13515
	798	790	788	786	778	748	740	738	736	728	73	65	63	61	53	898	890	888	886	878	98	90	88	86	78	148	140	138	136	128	13515
	783	785	792	787	793	733	735	742	737	743	58	60	67	62	68	883	885	892	887	893	83	85	92	87	93	133	135	142	137	143	13515
	781	800	780	782	797	731	750	730	732	747	56	75	55	57	72	881	900	880	882	897	81	100	80	82	97	131	150	130	132	147	13515
	29	26	46	44	45	404	401	421	419	420	529	526	546	544	545	254	251	271	269	270	579	576	596	594	595	854	851	871	869	870	13515
	49	39	34	41	27	424	414	409	416	402	549	539	534	541	527	274	264	259	266	252	599	589	584	591	577	874	864	859	866	852	13515
	48	40	38	36	28	423	415	413	411	403	548	540	538	536	528	273	265	263	261	253	598	590	588	586	578	873	865	863	861	853	13515
	33	35	42	37	43	408	410	417	412	418	533	535	542	537	543	258	260	267	262	268	583	585	592	587	593	858	860	867	862	868	13515
	31	50	30	32	47	406	425	405	407	422	531	550	530	532	547	256	275	255	257	272	581	600	580	582	597	856	875	855	857	872	13515
	179	176	196	194	195	279	276	296	294	295	554	551	571	569	570	429	426	446	444	445	504	501	521	519	520	704	701	721	719	720	13515
	199	189	184	191	177	299	289	284	291	277	574	564	559	566	552	449	439	434	441	427	524	514	509	516	502	724	714	709	716	702	13515
	198	190	188	186	178	298	290	288	286	278	573	565	563	561	553	448	440	438	436	428	523	515	513	511	503	723	715	713	711	703	13515
	183	185	192	187	193	283	285	292	287	293	558	560	567	562	568	433	435	442	437	443	508	510	517	512	518	708	710	717	712	718	13515
	181	200	180	182	197	281	300	280	282	297	556	575	555	557	572	431	450	430	432	447	506	525	505	507	522	706	725	705	707	722	13515
	229	226	246	244	245	629	626	646	644	645	304	301	321	319	320	479	476	496	494	495	354	351	371	369	370	654	651	671	669	670	13515
	249	239	234	241	227	649	639	634	641	627	324	314	309	316	302	499	489	484	491	477	374	364	359	366	352	674	664	659	666	652	13515
	248	240	238	236	228	648	640	638	636	628	323	315	313	311	303	498	490	488	486	478	373	365	363	361	353	673	665	663	661	653	13515
	233	235	242	237	243	633	635	642	637	643	308	310	317	312	318	483	485	492	487	493	358	360	367	362	368	658	660	667	662	668	13515
	231	250	230	232	247	631	650	630	632	647	306	325	305	307	322	481	500	480	482	497	356	375	355	357	372	656	675	655	657	672	13515
	679	676	696	694	695	454	451	471	469	470	379	376	396	394	395	604	601	621	619	620	329	326	346	344	345	204	201	221	219	220	13515
	699	689	684	691	677	474	464	459	466	452	399	389	384	391	377	624	614	609	616	602	349	339	334	341	327	224	214	209	216	202	13515
	698	690	688	686	678	473	465	463	461	453	398	390	388	386	378	623	615	613	611	603	348	340	338	336	328	223	215	213	211	203	13515
	683	685	692	687	693	458	460	467	462	468	383	385	392	387	393	608	610	617	612	618	333	335	342	337	343	208	210	217	212	218	13515
	681	700	680	682	697	456	475	455	457	472	381	400	380	382	397	606	625	605	607	622	331	350	330	332	347	206	225	205	207	222	13515
	754	751	771	769	770	154	151	171	169	170	829	826	846	844	845	4	1	21	19	20	804	801	821	819	820	104	101	121	119	120	13515
	774	764	759	766	752	174	164	159	166	152	849	839	834	841	827	24	14	9	16	2	824	814	809	816	802	124	114	109	116	102	13515
	773	765	763	761	753	173	165	163	161	153	848	840	838	836	828	23	15	13	11	3	823	815	813	811	803	123	115	113	111	103	13515
	758	760	767	762	768	158	160	167	162	168	833	835	842	837	843	8	10	17	12	18	808	810	817	812	818	108	110	117	112	118	13515
	756	775	755	757	772	156	175	155	157	172	831	850	830	832	847	6	25	5	7	22	806	825	805	807	822	106	125	105	107	122	13515
	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515	13515

Above two magic squares of order 30 formed by blocks of magic squares of order 5 are with distributions

$$D_{30\times30} := \{1, 2, \ldots, 899, 900\}$$

2.3 Magic Squares of Order 25

These magic squares are obtained from above by the application of the formula $\frac{a^2-b^2}{2}$, $a > b$. Removing the external border of order 5 and then subtracting $\frac{35^2-25^2}{2} := 300$ from magic squares of orders 35, we get magic squares of orders 25 given by

25																										7825
	550	544	538	532	526	450	444	438	432	426	75	69	63	57	51	50	44	38	32	26	500	494	488	482	476	7825
	533	527	546	545	539	433	427	446	445	439	58	52	71	70	64	33	27	46	45	39	483	477	496	495	489	7825
	541	540	534	528	547	441	440	434	428	447	66	65	59	53	72	41	40	34	28	47	491	490	484	478	497	7825
	529	548	542	536	535	429	448	442	436	435	54	73	67	61	60	29	48	42	36	35	479	498	492	486	485	7825
	537	531	530	549	543	437	431	430	449	443	62	56	55	74	68	37	31	30	49	43	487	481	480	499	493	7825
	175	169	163	157	151	400	394	388	382	376	225	219	213	207	201	350	344	338	332	326	475	469	463	457	451	7825
	158	152	171	170	164	383	377	396	395	389	208	202	221	220	214	333	327	346	345	339	458	452	471	470	464	7825
	166	165	159	153	172	391	390	384	378	397	216	215	209	203	222	341	340	334	328	347	466	465	459	453	472	7825
	154	173	167	161	160	379	398	392	386	385	204	223	217	211	210	329	348	342	336	335	454	473	467	461	460	7825
	162	156	155	174	168	387	381	380	399	393	212	206	205	224	218	337	331	330	349	343	462	456	455	474	468	7825
	125	119	113	107	101	275	269	263	257	251	325	319	313	307	301	375	369	363	357	351	525	519	513	507	501	7825
	108	102	121	120	114	258	252	271	270	264	308	302	321	320	314	358	352	371	370	364	508	502	521	520	514	7825
	116	115	109	103	122	266	265	259	253	272	316	315	309	303	322	366	365	359	353	372	516	515	509	503	522	7825
	104	123	117	111	110	254	273	267	261	260	304	323	317	311	310	354	373	367	361	360	504	523	517	511	510	7825
	112	106	105	124	118	262	256	255	274	268	312	306	305	324	318	362	356	355	374	368	512	506	505	524	518	7825
	625	619	613	607	601	300	294	288	282	276	425	419	413	407	401	250	244	238	232	226	25	19	13	7	1	7825
	608	602	621	620	614	283	277	296	295	289	408	402	421	420	414	233	227	246	245	239	8	2	21	20	14	7825
	616	615	609	603	622	291	290	284	278	297	416	415	409	403	422	241	240	234	228	247	16	15	9	3	22	7825
	604	623	617	611	610	279	298	292	286	285	404	423	417	411	410	229	248	242	236	235	4	23	17	11	10	7825
	612	606	605	624	618	287	281	280	299	293	412	406	405	424	418	237	231	230	249	243	12	6	5	24	18	7825
	150	144	138	132	126	200	194	188	182	176	575	569	563	557	551	600	594	588	582	576	100	94	88	82	76	7825
	133	127	146	145	139	183	177	196	195	189	558	552	571	570	564	583	577	596	595	589	83	77	96	95	89	7825
	141	140	134	128	147	191	190	184	178	197	566	565	559	553	572	591	590	584	578	597	91	90	84	78	97	7825
	129	148	142	136	135	179	198	192	186	185	554	573	567	561	560	579	598	592	586	585	79	98	92	86	85	7825
	137	131	130	149	143	187	181	180	199	193	562	556	555	574	568	587	581	580	599	593	87	81	80	99	93	7825
	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825

25																										7825
	529	526	546	544	545	429	426	446	444	445	54	51	71	69	70	29	26	46	44	45	479	476	496	494	495	7825
	549	539	534	541	527	449	439	434	441	427	74	64	59	66	52	49	39	34	41	27	499	489	484	491	477	7825
	548	540	538	536	528	448	440	438	436	428	73	65	63	61	53	48	40	38	36	28	498	490	488	486	478	7825
	533	535	542	537	543	433	435	442	437	443	58	60	67	62	68	33	35	42	37	43	483	485	492	487	493	7825
	531	550	530	532	547	431	450	430	432	447	56	75	55	57	72	31	50	30	32	47	481	500	480	482	497	7825
	154	151	171	169	170	379	376	396	394	395	204	201	221	219	220	329	326	346	344	345	454	451	471	469	470	7825
	174	164	159	166	152	399	389	384	391	377	224	214	209	216	202	349	339	334	341	327	474	464	459	466	452	7825
	173	165	163	161	153	398	390	388	386	378	223	215	213	211	203	348	340	338	336	328	473	465	463	461	453	7825
	158	160	167	162	168	383	385	392	387	393	208	210	217	212	218	333	335	342	337	343	458	460	467	462	468	7825
	156	175	155	157	172	381	400	380	382	397	206	225	205	207	222	331	350	330	332	347	456	475	455	457	472	7825
	104	101	121	119	120	254	251	271	269	270	304	301	321	319	320	354	351	371	369	370	504	501	521	519	520	7825
	124	114	109	116	102	274	264	259	266	252	324	314	309	316	302	374	364	359	366	352	524	514	509	516	502	7825
	123	115	113	111	103	273	265	263	261	253	323	315	313	311	303	373	365	363	361	353	523	515	513	511	503	7825
	108	110	117	112	118	258	260	267	262	268	308	310	317	312	318	358	360	367	362	368	508	510	517	512	518	7825
	106	125	105	107	122	256	275	255	257	272	306	325	305	307	322	356	375	355	357	372	506	525	505	507	522	7825
	604	601	621	619	620	279	276	296	294	295	404	401	421	419	420	229	226	246	244	245	4	1	21	19	20	7825
	624	614	609	616	602	299	289	284	291	277	424	414	409	416	402	249	239	234	241	227	24	14	9	16	2	7825
	623	615	613	611	603	298	290	288	286	278	423	415	413	411	403	248	240	238	236	228	23	15	13	11	3	7825
	608	610	617	612	618	283	285	292	287	293	408	410	417	412	418	233	235	242	237	243	8	10	17	12	18	7825
	606	625	605	607	622	281	300	280	282	297	406	425	405	407	422	231	250	230	232	247	6	25	5	7	22	7825
	129	126	146	144	145	179	176	196	194	195	554	551	571	569	570	579	576	596	594	595	79	76	96	94	95	7825
	149	139	134	141	127	199	189	184	191	177	574	564	559	566	552	599	589	584	591	577	99	89	84	91	77	7825
	148	140	138	136	128	198	190	188	186	178	573	565	563	561	553	598	590	588	586	578	98	90	88	86	78	7825
	133	135	142	137	143	183	185	192	187	193	558	560	567	562	568	583	585	592	587	593	83	85	92	87	93	7825
	131	150	130	132	147	181	200	180	182	197	556	575	555	557	572	581	600	580	582	597	81	100	80	82	97	7825
	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825

Above two magic squares of order 25 formed by blocks of magic squares of order 5 are with distributions

$$D_{25\times 25} := \{1, 2, \ldots, 624, 625\}$$

2.4 Magic Squares of Order 20

These magic squares are obtained from above by the application of the formula $\frac{a^2-b^2}{2}$, $a>b$. Removing the external border of order 5 and then subtracting $\frac{30^2-20^2}{2}:=250$ from magic squares of orders 30, we get magic squares of orders 20 given by

	pan	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010
4010	175	169	163	157	151	300	294	288	282	276	25	19	13	7	1	350	344	338	332	326	4010
4010	158	152	171	170	164	283	277	296	295	289	8	2	21	20	14	333	327	346	345	339	4010
4010	166	165	159	153	172	291	290	284	278	297	16	15	9	3	22	341	340	334	328	347	4010
4010	154	173	167	161	160	279	298	292	286	285	4	23	17	11	10	329	348	342	336	335	4010
4010	162	156	155	174	168	287	281	280	299	293	12	6	5	24	18	337	331	330	349	343	4010
4010	50	44	38	32	26	325	319	313	307	301	200	194	188	182	176	275	269	263	257	251	4010
4010	33	27	46	45	39	308	302	321	320	314	183	177	196	195	189	258	252	271	270	264	4010
4010	41	40	34	28	47	316	315	309	303	322	191	190	184	178	197	266	265	259	253	272	4010
4010	29	48	42	36	35	304	323	317	311	310	179	198	192	186	185	254	273	267	261	260	4010
4010	37	31	30	49	43	312	306	305	324	318	187	181	180	199	193	262	256	255	274	268	4010
4010	400	394	388	382	376	75	69	63	57	51	250	244	238	232	226	125	119	113	107	101	4010
4010	383	377	396	395	389	58	52	71	70	64	233	227	246	245	239	108	102	121	120	114	4010
4010	391	390	384	378	397	66	65	59	53	72	241	240	234	228	247	116	115	109	103	122	4010
4010	379	398	392	386	385	54	73	67	61	60	229	248	242	236	235	104	123	117	111	110	4010
4010	387	381	380	399	393	62	56	55	74	68	237	231	230	249	243	112	106	105	124	118	4010
4010	225	219	213	207	201	150	144	138	132	126	375	369	363	357	351	100	94	88	82	76	4010
4010	208	202	221	220	214	133	127	146	145	139	358	352	371	370	364	83	77	96	95	89	4010
4010	216	215	209	203	222	141	140	134	128	147	366	365	359	353	372	91	90	84	78	97	4010
4010	204	223	217	211	210	129	148	142	136	135	354	373	367	361	360	79	98	92	86	85	4010
	212	206	205	224	218	137	131	130	149	143	362	356	355	374	368	87	81	80	99	93	4010
	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010

20																					4010
	154	151	171	169	170	279	276	296	294	295	4	1	21	19	20	329	326	346	344	345	4010
	174	164	159	166	152	299	289	284	291	277	24	14	9	16	2	349	339	334	341	327	4010
	173	165	163	161	153	298	290	288	286	278	23	15	13	11	3	348	340	338	336	328	4010
	158	160	167	162	168	283	285	292	287	293	8	10	17	12	18	333	335	342	337	343	4010
	156	175	155	157	172	281	300	280	282	297	6	25	5	7	22	331	350	330	332	347	4010
	29	26	46	44	45	304	301	321	319	320	179	176	196	194	195	254	251	271	269	270	4010
	49	39	34	41	27	324	314	309	316	302	199	189	184	191	177	274	264	259	266	252	4010
	48	40	38	36	28	323	315	313	311	303	198	190	188	186	178	273	265	263	261	253	4010
	33	35	42	37	43	308	310	317	312	318	183	185	192	187	193	258	260	267	262	268	4010
	31	50	30	32	47	306	325	305	307	322	181	200	180	182	197	256	275	255	257	272	4010
	379	376	396	394	395	54	51	71	69	70	229	226	246	244	245	104	101	121	119	120	4010
	399	389	384	391	377	74	64	59	66	52	249	239	234	241	227	124	114	109	116	102	4010
	398	390	388	386	378	73	65	63	61	53	248	240	238	236	228	123	115	113	111	103	4010
	383	385	392	387	393	58	60	67	62	68	233	235	242	237	243	108	110	117	112	118	4010
	381	400	380	382	397	56	75	55	57	72	231	250	230	232	247	106	125	105	107	122	4010
	204	201	221	219	220	129	126	146	144	145	354	351	371	369	370	79	76	96	94	95	4010
	224	214	209	216	202	149	139	134	141	127	374	364	359	366	352	99	89	84	91	77	4010
	223	215	213	211	203	148	140	138	136	128	373	365	363	361	353	98	90	88	86	78	4010
	208	210	217	212	218	133	135	142	137	143	358	360	367	362	368	83	85	92	87	93	4010
	206	225	205	207	222	131	150	130	132	147	356	375	355	357	372	81	100	80	82	97	4010
	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010

Above two magic squares of order 20 formed by blocks of magic squares of order 5 are with distributions

$$D_{20\times 20} := \{1, 2, \ldots, 399, 400\}$$

2.5 Magic Squares of Order 15

These magic squares are obtained from above by the application of the formula $\frac{a^2-b^2}{2}$, $a > b$. Removing the external border of order 5 and then subtracting $\frac{25^2-15^2}{2} := 200$ from magic squares of orders 25, we get magic squares of orders 15 given by

15																1695
	200	194	188	182	176	25	19	13	7	1	150	144	138	132	126	1695
	183	177	196	195	189	8	2	21	20	14	133	127	146	145	139	1695
	191	190	184	178	197	16	15	9	3	22	141	140	134	128	147	1695
	179	198	192	186	185	4	23	17	11	10	129	148	142	136	135	1695
	187	181	180	199	193	12	6	5	24	18	137	131	130	149	143	1695
	75	69	63	57	51	125	119	113	107	101	175	169	163	157	151	1695
	58	52	71	70	64	108	102	121	120	114	158	152	171	170	164	1695
	66	65	59	53	72	116	115	109	103	122	166	165	159	153	172	1695
	54	73	67	61	60	104	123	117	111	110	154	173	167	161	160	1695
	62	56	55	74	68	112	106	105	124	118	162	156	155	174	168	1695
	100	94	88	82	76	225	219	213	207	201	50	44	38	32	26	1695
	83	77	96	95	89	208	202	221	220	214	33	27	46	45	39	1695
	91	90	84	78	97	216	215	209	203	222	41	40	34	28	47	1695
	79	98	92	86	85	204	223	217	211	210	29	48	42	36	35	1695
	87	81	80	99	93	212	206	205	224	218	37	31	30	49	43	1695
	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695

15																1695
	179	176	196	194	195	4	1	21	19	20	129	126	146	144	145	1695
	199	189	184	191	177	24	14	9	16	2	149	139	134	141	127	1695
	198	190	188	186	178	23	15	13	11	3	148	140	138	136	128	1695
	183	185	192	187	193	8	10	17	12	18	133	135	142	137	143	1695
	181	200	180	182	197	6	25	5	7	22	131	150	130	132	147	1695
	54	51	71	69	70	104	101	121	119	120	154	151	171	169	170	1695
	74	64	59	66	52	124	114	109	116	102	174	164	159	166	152	1695
	73	65	63	61	53	123	115	113	111	103	173	165	163	161	153	1695
	58	60	67	62	68	108	110	117	112	118	158	160	167	162	168	1695
	56	75	55	57	72	106	125	105	107	122	156	175	155	157	172	1695
	79	76	96	94	95	204	201	221	219	220	29	26	46	44	45	1695
	99	89	84	91	77	224	214	209	216	202	49	39	34	41	27	1695
	98	90	88	86	78	223	215	213	211	203	48	40	38	36	28	1695
	83	85	92	87	93	208	210	217	212	218	33	35	42	37	43	1695
	81	100	80	82	97	206	225	205	207	222	31	50	30	32	47	1695
	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695

Above two magic squares of order 20 formed by blocks of magic squares of order 5 are with distributions

$$D_{20\times 20} := \{1, 2, \ldots, 224, 225\}$$

3 Pandiagonal Magic Squares Multiples 5

This section brings pandiagonal magic squares multiples 5. It includes magic squares of orders 15, 20, 25, 35 and 40. The details are excluded as these are studied extensively in author's previous works [5, 7, 20].

3.1 Pandiagonal Magic Square of Order 15

Below is a **pandiagonal** magic squares of order 15.

Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
Zenodo, May 06, 2023, pp. 1-31, *https://doi.org/10.5281/zenodo.7903412*

	pan	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695
1695	1	87	111	178	188	3	86	110	179	187	2	85	109	180	189	1695
1695	171	193	8	76	117	170	194	7	78	116	169	195	9	77	115	1695
1695	83	106	177	186	13	82	108	176	185	14	84	107	175	184	15	1695
1695	192	6	88	113	166	191	5	89	112	168	190	4	90	114	167	1695
1695	118	173	181	12	81	119	172	183	11	80	120	174	182	10	79	1695
1695	31	72	96	163	203	33	71	95	164	202	32	70	94	165	204	1695
1695	156	208	38	61	102	155	209	37	63	101	154	210	39	62	100	1695
1695	68	91	162	201	43	67	93	161	200	44	69	92	160	199	45	1695
1695	207	36	73	98	151	206	35	74	97	153	205	34	75	99	152	1695
1695	103	158	196	42	66	104	157	198	41	65	105	159	197	40	64	1695
1695	16	57	126	148	218	18	56	125	149	217	17	55	124	150	219	1695
1695	141	223	23	46	132	140	224	22	48	131	139	225	24	47	130	1695
1695	53	121	147	216	28	52	123	146	215	29	54	122	145	214	30	1695
1695	222	21	58	128	136	221	20	59	127	138	220	19	60	129	137	1695
	133	143	211	27	51	134	142	213	26	50	135	144	212	25	49	1695
	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695	1695

The blocks of order 5 are **equal sums** magic squares, i.e., $M_{5\times5} := 565$

3.2 Pandiagonal Magic Square of Order 20

Below is a **pandiagonal** magic squares of order 20.

Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
Zenodo, May 06, 2023, pp. 1-31, *https://doi.org/10.5281/zenodo.7903412*

	pan	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010
4010	175	169	163	157	151	300	294	288	282	276	25	19	13	7	1	350	344	338	332	326	4010
4010	158	152	171	170	164	283	277	296	295	289	8	2	21	20	14	333	327	346	345	339	4010
4010	166	165	159	153	172	291	290	284	278	297	16	15	9	3	22	341	340	334	328	347	4010
4010	154	173	167	161	160	279	298	292	286	285	4	23	17	11	10	329	348	342	336	335	4010
4010	162	156	155	174	168	287	281	280	299	293	12	6	5	24	18	337	331	330	349	343	4010
4010	50	44	38	32	26	325	319	313	307	301	200	194	188	182	176	275	269	263	257	251	4010
4010	33	27	46	45	39	308	302	321	320	314	183	177	196	195	189	258	252	271	270	264	4010
4010	41	40	34	28	47	316	315	309	303	322	191	190	184	178	197	266	265	259	253	272	4010
4010	29	48	42	36	35	304	323	317	311	310	179	198	192	186	185	254	273	267	261	260	4010
4010	37	31	30	49	43	312	306	305	324	318	187	181	180	199	193	262	256	255	274	268	4010
4010	400	394	388	382	376	75	69	63	57	51	250	244	238	232	226	125	119	113	107	101	4010
4010	383	377	396	395	389	58	52	71	70	64	233	227	246	245	239	108	102	121	120	114	4010
4010	391	390	384	378	397	66	65	59	53	72	241	240	234	228	247	116	115	109	103	122	4010
4010	379	398	392	386	385	54	73	67	61	60	229	248	242	236	235	104	123	117	111	110	4010
4010	387	381	380	399	393	62	56	55	74	68	237	231	230	249	243	112	106	105	124	118	4010
4010	225	219	213	207	201	150	144	138	132	126	375	369	363	357	351	100	94	88	82	76	4010
4010	208	202	221	220	214	133	127	146	145	139	358	352	371	370	364	83	77	96	95	89	4010
4010	216	215	209	203	222	141	140	134	128	147	366	365	359	353	372	91	90	84	78	97	4010
4010	204	223	217	211	210	129	148	142	136	135	354	373	367	361	360	79	98	92	86	85	4010
	212	206	205	224	218	137	131	130	149	143	362	356	355	374	368	87	81	80	99	93	4010
	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010	4010

The blocks of order 5 are **different sums** pandiagonal magic squares. It is the same magic square given in previous section.

3.3 Pandiagonal Magic Square of Order 25

Below is a **pandiagonal** magic squares of order 25.

																											3263025
pan	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	
7825	1	220	284	498	562	417	606	75	139	328	183	272	461	530	119	599	38	227	316	385	365	429	518	82	171	7825	3263025
7825	484	573	12	201	295	150	339	403	617	56	536	105	194	258	472	302	391	585	49	238	93	157	371	440	504	7825	3263025
7825	212	276	495	559	23	603	67	131	350	414	269	458	547	111	180	35	249	313	377	591	446	515	79	168	357	7825	3263025
7825	570	9	223	287	476	331	425	614	53	142	122	186	255	469	533	388	577	41	235	324	154	368	432	521	90	7825	3263025
7825	298	487	551	20	209	64	128	342	406	625	455	544	108	197	261	241	310	399	588	27	507	96	165	354	443	7825	3263025
7825	583	47	236	305	394	374	438	502	91	160	15	204	293	482	571	401	620	59	148	337	192	256	475	539	103	7825	3263025
7825	311	380	594	33	247	77	166	360	449	513	493	557	21	215	279	134	348	412	601	70	550	114	178	267	456	7825	3263025
7825	44	233	322	386	580	435	524	88	152	366	221	290	479	568	7	612	51	145	334	423	253	467	531	125	189	7825	3263025
7825	397	586	30	244	308	163	352	441	510	99	554	18	207	296	490	345	409	623	62	126	106	200	264	453	542	7825	3263025
7825	230	319	383	597	36	516	85	174	363	427	282	496	565	4	218	73	137	326	420	609	464	528	117	181	275	7825	3263025
7825	415	604	68	132	346	176	270	459	548	112	592	31	250	314	378	358	447	511	80	169	24	213	277	491	560	7825	3263025
7825	143	332	421	615	54	534	123	187	251	470	325	389	578	42	231	86	155	369	433	522	477	566	10	224	288	7825	3263025
7825	621	65	129	343	407	262	451	545	109	198	28	242	306	400	589	444	508	97	161	355	210	299	488	552	16	7825	3263025
7825	329	418	607	71	140	120	184	273	462	526	381	600	39	228	317	172	361	430	519	83	563	2	216	285	499	7825	3263025
7825	57	146	340	404	618	473	537	101	195	259	239	303	392	581	50	505	94	158	372	436	291	485	574	13	202	7825	3263025
7825	367	431	525	89	153	8	222	286	480	569	424	613	52	141	335	190	254	468	532	121	576	45	234	323	387	7825	3263025
7825	100	164	353	442	506	486	555	19	208	297	127	341	410	624	63	543	107	196	265	454	309	398	587	26	245	7825	3263025
7825	428	517	81	175	364	219	283	497	561	5	610	74	138	327	416	271	465	529	118	182	37	226	320	384	598	7825	3263025
7825	156	375	439	503	92	572	11	205	294	483	338	402	616	60	149	104	193	257	471	540	395	584	48	237	301	7825	3263025
7825	514	78	167	356	450	280	494	558	22	211	66	135	349	413	602	457	546	115	179	268	248	312	376	595	34	7825	3263025
7825	199	263	452	541	110	590	29	243	307	396	351	445	509	98	162	17	206	300	489	553	408	622	61	130	344	7825	3263025
7825	527	116	185	274	463	318	382	596	40	229	84	173	362	426	520	500	564	3	217	281	136	330	419	608	72	7825	3263025
7825	260	474	538	102	191	46	240	304	393	582	437	501	95	159	373	203	292	481	575	14	619	58	147	336	405	7825	3263025
7825	113	177	266	460	549	379	593	32	246	315	170	359	448	512	76	556	25	214	278	492	347	411	605	69	133	7825	3263025
	466	535	124	188	252	232	321	390	579	43	523	87	151	370	434	289	478	567	6	225	55	144	333	422	611	7825	3263025
	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	7825	
	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025	3263025		3263025

The blocks of order 5 are **equal sums pandiagonal** magic squares, i.e., $M_{5\times5} := 1565$. Moreover it is bimagic squares with bimagic sum $Sb_{5\times5} := 3263025$

3.4 Pandiagonal Magic Square of Order 35

Below is a **pandiagonal** magic squares of order 35.

	pan	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455
21455	901	674	90	312	1088	649	210	216	1213	777	253	1177	524	746	365	1081	817	619	390	158	865	457	714	63	966	433	30	981	1032	589	109	926	1147	535	348	21455
21455	300	1117	878	691	79	1196	793	637	194	245	769	361	260	1163	512	409	145	1068	836	607	49	973	861	480	702	1016	577	449	13	1010	552	325	138	914	1136	21455
21455	668	96	289	1105	907	182	229	1225	776	653	1170	498	757	384	256	823	626	397	164	1055	476	725	37	959	868	29	993	1045	561	437	943	1124	541	342	115	21455
21455	1094	895	697	73	306	805	636	198	217	1209	372	279	1166	505	743	152	1074	810	613	416	947	854	483	721	60	590	421	17	1009	1028	331	132	920	1153	529	21455
21455	102	283	1111	884	685	233	1197	789	665	181	501	750	358	267	1189	600	403	171	1062	829	728	56	970	842	469	997	1044	573	450	1	1130	558	319	121	937	21455
21455	445	2	994	1043	581	118	940	1121	542	344	879	681	97	290	1118	656	184	230	1222	773	264	1190	496	758	357	1058	827	629	396	155	871	467	724	40	963	21455
21455	1029	588	441	25	982	526	332	134	923	1150	307	1095	908	669	86	1210	802	633	201	219	741	373	252	1174	525	419	151	1065	813	617	59	950	858	486	712	21455
21455	21	1005	1017	574	448	939	1133	555	316	122	698	74	296	1112	885	178	236	1199	790	662	1162	509	770	356	268	820	603	407	174	1061	473	731	47	969	845	21455
21455	562	434	28	1001	1040	345	106	927	1149	538	1101	902	675	103	284	779	650	207	213	1216	385	251	1178	497	754	162	1084	816	610	393	957	864	460	718	66	21455
21455	1008	1036	585	422	14	1137	554	328	135	911	80	313	1089	891	692	242	1193	796	639	195	513	742	369	280	1161	606	400	148	1072	839	705	53	976	852	479	21455
21455	1069	840	601	408	147	848	477	734	46	960	451	12	1004	1020	578	130	912	1134	553	336	888	695	71	297	1114	634	191	237	1200	803	271	1164	510	767	353	21455
21455	391	163	1057	824	630	69	956	855	463	722	1039	565	438	31	992	539	343	126	935	1122	281	1102	904	678	100	1217	780	663	179	226	755	382	248	1181	499	21455
21455	812	614	420	146	1073	470	708	57	979	851	18	1011	1027	584	425	931	1145	527	329	133	694	83	310	1086	892	208	214	1206	797	640	1158	516	744	370	277	21455
21455	175	1056	828	602	404	967	874	466	715	43	572	444	5	998	1046	317	119	938	1141	550	1115	876	682	99	293	786	657	185	243	1194	359	265	1187	493	761	21455
21455	618	392	159	1085	811	711	50	953	862	489	985	1033	591	432	24	1148	546	340	107	924	87	309	1098	905	666	220	1223	774	646	202	522	738	376	254	1175	21455
21455	643	205	211	1207	799	249	1171	517	745	383	1076	814	615	417	143	859	490	706	58	952	428	22	1014	1026	575	136	922	1144	530	333	900	667	84	308	1106	21455
21455	1191	787	659	188	240	762	360	278	1159	506	405	172	1053	831	604	41	968	847	474	735	1049	571	435	8	1002	549	320	123	941	1132	294	1113	896	690	72	21455
21455	204	223	1220	771	647	1188	494	751	377	255	808	621	394	160	1082	462	719	70	951	863	15	988	1037	594	431	928	1151	537	339	110	686	95	282	1099	903	21455
21455	800	631	192	239	1203	366	272	1165	523	739	149	1070	837	598	411	980	846	478	707	54	582	454	11	995	1023	327	129	915	1138	556	1087	889	693	91	305	21455
21455	227	1219	783	660	176	500	768	354	261	1182	627	388	166	1059	825	723	42	964	875	461	991	1030	568	442	34	1125	543	346	117	934	98	301	1110	877	679	21455
21455	113	932	1154	536	330	906	677	94	285	1103	655	177	224	1218	791	258	1185	491	752	379	1054	821	622	395	173	866	464	720	67	948	439	35	986	1038	567	21455
21455	559	326	120	918	1142	304	1090	893	696	82	1204	798	651	200	212	736	367	274	1168	520	412	150	1083	809	611	55	977	843	481	709	1021	583	427	19	1015	21455
21455	925	1128	547	349	116	683	101	292	1109	880	196	235	1192	784	658	1184	503	765	351	262	838	599	401	167	1060	458	726	44	965	872	7	999	1050	566	443	21455
21455	337	139	921	1135	533	1097	899	670	88	311	772	644	203	231	1215	380	246	1172	519	748	156	1077	815	628	389	954	860	487	703	61	595	426	23	987	1034	21455
21455	1131	540	323	127	944	75	298	1116	887	689	238	1211	795	632	189	507	764	363	275	1156	605	418	144	1066	832	732	38	971	849	475	1003	1022	579	455	6	21455
21455	844	471	727	45	978	446	9	1000	1047	563	124	945	1126	548	322	883	687	104	291	1100	661	187	234	1195	788	270	1157	504	763	371	1063	835	596	402	169	21455
21455	62	955	873	459	716	1035	592	423	26	989	531	338	112	929	1155	314	1096	890	673	92	1214	775	648	206	222	749	378	266	1180	492	386	157	1079	818	625	21455
21455	488	704	51	972	850	3	1006	1024	580	452	917	1139	560	321	128	680	78	302	1119	886	193	241	1202	794	635	1176	515	737	364	273	834	608	415	141	1067	21455
21455	961	867	465	733	39	569	440	32	983	1041	350	111	933	1127	544	1107	909	676	85	288	782	654	180	228	1221	352	259	1183	511	760	170	1051	822	624	398	21455
21455	710	68	949	856	482	1012	1018	586	429	20	1143	532	334	140	916	81	295	1093	897	699	215	1208	801	642	199	518	756	375	247	1169	612	414	153	1080	806	21455
21455	276	1167	514	740	368	1075	807	609	413	161	853	485	701	52	974	424	16	1007	1025	593	131	919	1140	557	318	894	700	76	303	1092	638	197	244	1201	785	21455
21455	759	355	263	1186	502	399	168	1071	830	597	36	962	869	468	730	1042	570	453	4	996	545	347	108	936	1129	286	1108	882	684	105	1224	781	645	183	232	21455
21455	1173	521	747	374	250	826	620	387	154	1078	484	713	65	946	857	33	984	1031	587	430	913	1146	534	335	137	672	89	315	1091	898	190	218	1212	804	641	21455
21455	362	269	1160	508	766	142	1064	833	616	410	975	841	472	729	48	576	447	10	1013	1019	324	125	942	1123	551	1120	881	688	77	299	792	664	186	225	1198	21455
	495	753	381	257	1179	623	406	165	1052	819	717	64	958	870	456	990	1048	564	436	27	1152	528	341	114	930	93	287	1104	910	671	221	1205	778	652	209	21455
	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455	21455

The blocks of order 5 are **equal sums pandiagonal** magic squares, i.e., $M_{5\times 5} := 3065$.

3.5 Pandiagonal Magic Square of Order 40

Below is a **pandiagonal** magic squares of order 40.

Block-Wise Bordered and Pandiagonal Magic Squares Multiples of 5,
Zenodo, May 06, 2023, pp. 1-31, *https://doi.org/10.5281/zenodo.7903412*

	pan	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020
32020	175	169	163	157	151	1500	1494	1488	1482	1476	25	19	13	7	1	1550	1544	1538	1532	1526	375	369	363	357	351	1300	1294	1288	1282	1276	225	219	213	207	201	1350	1344	1338	1332	1326	32020
32020	158	152	171	170	164	1483	1477	1496	1495	1489	8	2	21	20	14	1533	1527	1546	1545	1539	358	352	371	370	364	1283	1277	1296	1295	1289	208	202	221	220	214	1333	1327	1346	1345	1339	32020
32020	166	165	159	153	172	1491	1490	1484	1478	1497	16	15	9	3	22	1541	1540	1534	1528	1547	366	365	359	353	372	1291	1290	1284	1278	1297	216	215	209	203	222	1341	1340	1334	1328	1347	32020
32020	154	173	167	161	160	1479	1498	1492	1486	1485	4	23	17	11	10	1529	1548	1542	1536	1535	354	373	367	361	360	1279	1298	1292	1286	1285	204	223	217	211	210	1329	1348	1342	1336	1335	32020
32020	162	156	155	174	168	1487	1481	1480	1499	1493	12	6	5	24	18	1537	1531	1530	1549	1543	362	356	355	374	368	1287	1281	1280	1299	1293	212	206	205	224	218	1337	1331	1330	1349	1343	32020
32020	50	44	38	32	26	1525	1519	1513	1507	1501	200	194	188	182	176	1475	1469	1463	1457	1451	250	244	238	232	226	1325	1319	1313	1307	1301	400	394	388	382	376	1275	1269	1263	1257	1251	32020
32020	33	27	46	45	39	1508	1502	1521	1520	1514	183	177	196	195	189	1458	1452	1471	1470	1464	233	227	246	245	239	1308	1302	1321	1320	1314	383	377	396	395	389	1258	1252	1271	1270	1264	32020
32020	41	40	34	28	47	1516	1515	1509	1503	1522	191	190	184	178	197	1466	1465	1459	1453	1472	241	240	234	228	247	1316	1315	1309	1303	1322	391	390	384	378	397	1266	1265	1259	1253	1272	32020
32020	29	48	42	36	35	1504	1523	1517	1511	1510	179	198	192	186	185	1454	1473	1467	1461	1460	229	248	242	236	235	1304	1323	1317	1311	1310	379	398	392	386	385	1254	1273	1267	1261	1260	32020
32020	37	31	30	49	43	1512	1506	1505	1524	1518	187	181	180	199	193	1462	1456	1455	1474	1468	237	231	230	249	243	1312	1306	1305	1324	1318	387	381	380	399	393	1262	1256	1255	1274	1268	32020
32020	1600	1594	1588	1582	1576	75	69	63	57	51	1450	1444	1438	1432	1426	125	119	113	107	101	1400	1394	1388	1382	1376	275	269	263	257	251	1250	1244	1238	1232	1226	325	319	313	307	301	32020
32020	1583	1577	1596	1595	1589	58	52	71	70	64	1433	1427	1446	1445	1439	108	102	121	120	114	1383	1377	1396	1395	1389	258	252	271	270	264	1233	1227	1246	1245	1239	308	302	321	320	314	32020
32020	1591	1590	1584	1578	1597	66	65	59	53	72	1441	1440	1434	1428	1447	116	115	109	103	122	1391	1390	1384	1378	1397	266	265	259	253	272	1241	1240	1234	1228	1247	316	315	309	303	322	32020
32020	1579	1598	1592	1586	1585	54	73	67	61	60	1429	1448	1442	1436	1435	104	123	117	111	110	1379	1398	1392	1386	1385	254	273	267	261	260	1229	1248	1242	1236	1235	304	323	317	311	310	32020
32020	1587	1581	1580	1599	1593	62	56	55	74	68	1437	1431	1430	1449	1443	112	106	105	124	118	1387	1381	1380	1399	1393	262	256	255	274	268	1237	1231	1230	1249	1243	312	306	305	324	318	32020
32020	1425	1419	1413	1407	1401	150	144	138	132	126	1575	1569	1563	1557	1551	100	94	88	82	76	1225	1219	1213	1207	1201	350	344	338	332	326	1375	1369	1363	1357	1351	300	294	288	282	276	32020
32020	1408	1402	1421	1420	1414	133	127	146	145	139	1558	1552	1571	1570	1564	83	77	96	95	89	1208	1202	1221	1220	1214	333	327	346	345	339	1358	1352	1371	1370	1364	283	277	296	295	289	32020
32020	1416	1415	1409	1403	1422	141	140	134	128	147	1566	1565	1559	1553	1572	91	90	84	78	97	1216	1215	1209	1203	1222	341	340	334	328	347	1366	1365	1359	1353	1372	291	290	284	278	297	32020
32020	1404	1423	1417	1411	1410	129	148	142	136	135	1554	1573	1567	1561	1560	79	98	92	86	85	1204	1223	1217	1211	1210	329	348	342	336	335	1354	1373	1367	1361	1360	279	298	292	286	285	32020
32020	1412	1406	1405	1424	1418	137	131	130	149	143	1562	1556	1555	1574	1568	87	81	80	99	93	1212	1206	1205	1224	1218	337	331	330	349	343	1362	1356	1355	1374	1368	287	281	280	299	293	32020
32020	575	569	563	557	551	1100	1094	1088	1082	1076	425	419	413	407	401	1150	1144	1138	1132	1126	775	769	763	757	751	900	894	888	882	876	625	619	613	607	601	950	944	938	932	926	32020
32020	558	552	571	570	564	1083	1077	1096	1095	1089	408	402	421	420	414	1133	1127	1146	1145	1139	758	752	771	770	764	883	877	896	895	889	608	602	621	620	614	933	927	946	945	939	32020
32020	566	565	559	553	572	1091	1090	1084	1078	1097	416	415	409	403	422	1141	1140	1134	1128	1147	766	765	759	753	772	891	890	884	878	897	616	615	609	603	622	941	940	934	928	947	32020
32020	554	573	567	561	560	1079	1098	1092	1086	1085	404	423	417	411	410	1129	1148	1142	1136	1135	754	773	767	761	760	879	898	892	886	885	604	623	617	611	610	929	948	942	936	935	32020
32020	562	556	555	574	568	1087	1081	1080	1099	1093	412	406	405	424	418	1137	1131	1130	1149	1143	762	756	755	774	768	887	881	880	899	893	612	606	605	624	618	937	931	930	949	943	32020
32020	450	444	438	432	426	1125	1119	1113	1107	1101	600	594	588	582	576	1075	1069	1063	1057	1051	650	644	638	632	626	925	919	913	907	901	800	794	788	782	776	875	869	863	857	851	32020
32020	433	427	446	445	439	1108	1102	1121	1120	1114	583	577	596	595	589	1058	1052	1071	1070	1064	633	627	646	645	639	908	902	921	920	914	783	777	796	795	789	858	852	871	870	864	32020
32020	441	440	434	428	447	1116	1115	1109	1103	1122	591	590	584	578	597	1066	1065	1059	1053	1072	641	640	634	628	647	916	915	909	903	922	791	790	784	778	797	866	865	859	853	872	32020
32020	429	448	442	436	435	1104	1123	1117	1111	1110	579	598	592	586	585	1054	1073	1067	1061	1060	629	648	642	636	635	904	923	917	911	910	779	798	792	786	785	854	873	867	861	860	32020
32020	437	431	430	449	443	1112	1106	1105	1124	1118	587	581	580	599	593	1062	1056	1055	1074	1068	637	631	630	649	643	912	906	905	924	918	787	781	780	799	793	862	856	855	874	868	32020
32020	1200	1194	1188	1182	1176	475	469	463	457	451	1050	1044	1038	1032	1026	525	519	513	507	501	1000	994	988	982	976	675	669	663	657	651	850	844	838	832	826	725	719	713	707	701	32020
32020	1183	1177	1196	1195	1189	458	452	471	470	464	1033	1027	1046	1045	1039	508	502	521	520	514	983	977	996	995	989	658	652	671	670	664	833	827	846	845	839	708	702	721	720	714	32020
32020	1191	1190	1184	1178	1197	466	465	459	453	472	1041	1040	1034	1028	1047	516	515	509	503	522	991	990	984	978	997	666	665	659	653	672	841	840	834	828	847	716	715	709	703	722	32020
32020	1179	1198	1192	1186	1185	454	473	467	461	460	1029	1048	1042	1036	1035	504	523	517	511	510	979	998	992	986	985	654	673	667	661	660	829	848	842	836	835	704	723	717	711	710	32020
32020	1187	1181	1180	1199	1193	462	456	455	474	468	1037	1031	1030	1049	1043	512	506	505	524	518	987	981	980	999	993	662	656	655	674	668	837	831	830	849	843	712	706	705	724	718	32020
32020	1025	1019	1013	1007	1001	550	544	538	532	526	1175	1169	1163	1157	1151	500	494	488	482	476	825	819	813	807	801	750	744	738	732	726	975	969	963	957	951	700	694	688	682	676	32020
32020	1008	1002	1021	1020	1014	533	527	546	545	539	1158	1152	1171	1170	1164	483	477	496	495	489	808	802	821	820	814	733	727	746	745	739	958	952	971	970	964	683	677	696	695	689	32020
32020	1016	1015	1009	1003	1022	541	540	534	528	547	1166	1165	1159	1153	1172	491	490	484	478	497	816	815	809	803	822	741	740	734	728	747	966	965	959	953	972	691	690	684	678	697	32020
32020	1004	1023	1017	1011	1010	529	548	542	536	535	1154	1173	1167	1161	1160	479	498	492	486	485	804	823	817	811	810	729	748	742	736	735	954	973	967	961	960	679	698	692	686	685	32020
	1012	1006	1005	1024	1018	537	531	530	549	543	1162	1156	1155	1174	1168	487	481	480	499	493	812	806	805	824	818	737	731	730	749	743	962	956	955	974	968	687	681	680	699	693	32020
	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020	32020

The blocks of order 5 are **different sums pandiagonal** magic squares. It is made from pandigonal magic squares of order 20 given above. Pandiagonal magic squares of order 20 are of equal sums $M_{20\times 20} := 16010$.

Remark 1. *The **excel file** attached with this work contains only **pandiagonal** magic squares with **equal sums** of order 5 up to order 145, i.e., these are of orders 15, 25, 35, 45, etc. It is not possible to write **pandiagonal** magic squares of orders 30, 50, 70, etc. Now we are left with magic squares of orders 60, 80, 100, etc. We can easily write **pandiagonal** magic squares of orders 60, 80, 100, etc. as these are multiples of order 20. The procedure applied is the same as we did for order 40. It is left for the readers to check it.*

4 Author's Contribution to Recreation of Numbers and Magic Squares

- **Inder J. Taneja**, Recreation of Numbers - *https://numbers-magic.com/?p=671*.
- **Inder J. Taneja**, Magic Squares - *https://numbers-magic.com/?cat=3*.

References

- **Block-Wise Magic Squares**

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