

COVERING TABLES

Last Updated: 05/08/2008

These tables show only coverings that have actually been constructed. See *New Constructions for Covering Designs* (*Journal of Combinatorial Designs*, vol. 3., pp. 269–284.) for details on the construction methods and references.

Key to Tables

- p — projective geometry covering
- a — affine geometry covering
- o — symmetric hill-climbing covering
- l — greedy covering, lexicographic order
- c — greedy covering, colex order
- g — greedy covering, Gray code order
- t — Turán theory
- m — multiple of smaller covering
- e — simple dynamic programming
- d — dynamic programming method
- u — Sidorenko Turán construction
- k — Kuperberg construction, using complement of a $[v, t]$ linear code
- i — induced covering
- v — Todorov construction
- r — greedy covering, random order
- w — miscellaneous; see covering for reference
- n — Nurmela-Östergård simulated annealing covering
- h — hill-climbing
- j — simple induced covering
- † — improvement to bound in JCD paper
- * — optimal covering
- ** — Steiner system

$v \backslash k$	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3														
4		3^{l*}												
5		4^{l*}	3^{l*}											
6		6^{o*}	3^{l*}	3^{l*}										
7		7^{l**}	5^{l*}	3^{l*}	3^{l*}									
8		11^{l*}	6^{l*}	4^{l*}	3^{l*}	3^{l*}								
9		12^{a**}	8^{l*}	5^{l*}	3^{l*}	3^{l*}	3^{l*}							
10		17^{e*}	9^{l*}	6^{j*}	4^{m*}	3^{l*}	3^{l*}	3^{l*}						
11		19^{r*}	11^{o*}	7^{r*}	6^{l*}	4^{l*}	3^{l*}	3^{l*}	3^{l*}					
12		24^{r*}	12^{o*}	9^{r*}	6^{l*}	5^{l*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}				
13		26^{r**}	13^{o**}	10^{l*}	7^{l*}	6^{l*}	4^{d*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}			
14		33^{e*}	18^{l*}	12^{l*}	7^{m*}	6^{n*}	5^{l*}	4^{l*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}		
15		35^{l**}	19^{r*}	13^{r*}	10^{l*}	7^{l*}	6^{l*}	4^{m*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}	
16		43^{l*}	20^{j**}	15^{r*}	10^{l*}	8^{j*}	6^{l*}	5^{l*}	4^{m*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}
17		46^{r*}	26^{c*}	16^{r*}	12^{l*}	9^{r*}	7^{l*}	6^{l*}	5^{l*}	4^{l*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}
18		54^{r*}	27^{w*}	18^{o*}	12^{m*}	10^{n*}	7^{j*}	6^{m*}	5^{m*}	4^{d*}	3^{l*}	3^{l*}	3^{l*}	3^{l*}
19		57^{j**}	31^{j*}	19^{o*}	15^{r*}	11^{l*}	9^{l*}	7^{l*}	6^{l*}	5^{l*}	4^{e*}	3^{l*}	3^{l*}	3^{l*}
20		67^{e*}	35^{r*}	21^{c*}	16^{n*}	12^{l*}	9^{m*}	7^{j*}	6^{l*}	6^{l*}	4^{m*}	4^{l*}	3^{l*}	3^{l*}
21		70^{j**}	37^{i*}	21^{o**}	17^{j*}	13^{l*}	11^{l*}	7^{m*}	7^{l*}	6^{l*}	5^{l*}	4^{e*}	3^{l*}	3^{l*}
22		81^{e*}	39^{w*}	27^{l*}	19^{m*}	13^{n*}	11^{l*}	9^{w*}	7^{m*}	6^{w*}	6^{l*}	5^{l*}	4^{m*}	3^{l*}
23		85^{j*}	46^{j*}	28^{l*}	21^h	16^w	12^{l*}	10^{l*}	8^{j*}	7^{l*}	6^{l*}	5^{l*}	4^{d*}	4^{l*}
24		96^{j*}	48^{w*}	30^{j*}	22^h	17^{w*}	12^{m*}	11^{l*}	8^{w*}	7^{j*}	6^{l*}	6^{l*}	5^{l*}	4^{m*}
25		100^{j**}	50^{j**}	30^{a**}	23^{n*}	18^{h*}	13^{j*}	11^{l*}	10^{l*}	7^{w*}	7^{l*}	6^{l*}	5^{i*}	4^{m*}
26		113^{e*}	59^{e*}	37^{e*}	24^{h*}	19^{w*}	13^{m*}	12^{j*}	10^{m*}	8^{w*}	7^{m*}	6^{w*}	6^{l*}	5^{l*}
27		117^{a**}	61^{j*}	38^{w*}	27^{o*}	20^{w*}	17^l	12^{m*}	11^{l*}	9^{w*}	7^{j*}	7^{l*}	6^{l*}	5^{m*}
28		131^{e*}	63^{j**}	40^{w*}	28^{o*}	22^j	17^{w*}	14^j	11^{l*}	10^{l*}	7^{m*}	7^{e*}	6^{l*}	6^{l*}
29		136^{j*}	73^{e*}	43^{w*}	30^{w*}	23^{w*}	18^{l*}	14^{h*}	12^{l*}	10^{w*}	9^{j*}	7^{e*}	7^{l*}	6^{l*}
30		150^{j*}	75^{w*}	48^{j*}	31^{j*}	25^w	19^{m*}	15^{j*}	13^{m*}	11^{w*}	9^{m*}	8^{j*}	7^{m*}	6^{m*}
31		155^{l**}	78^{w*}	50^{w*}	31^{o**}	26^{w*}	20^{j*}	17^{w*}	13^{j*}	12^{l*}	10^{l*}	8^{w*}	7^{j*}	7^{l*}
32		171^{l*}	88^{w*}	52^{w*}	38^{e*}	28^{w*}	20^{m*}	18^{w*}	14^{w*}	12^{l*}	10^{m*}	9^{w*}	7^{w*}	7^{e*}

Table 1: $t = 2$

$v \backslash k$	4	5	6	7	8	9	10	11	12	13	14	15	16
4													
5	4^{l*}												
6	6^{o*}	4^{l*}											
7	12^{e*}	5^{l*}	4^{l*}										
8	14^{l**}	8^{o*}	4^{l*}	4^{l*}									
9	25^{l*}	12^{l*}	7^{d*}	4^{l*}	4^{l*}								
10	30^{o**}	17^{r*}	10^{o*}	6^{l*}	4^{l*}	4^{l*}							
11	47^{e*}	20^{j*}	11^{o*}	8^{d*}	5^{l*}	4^{l*}	4^{l*}						
12	57^{j*}	29^n	15^{l*}	11^{l*}	6^{m*}	4^{l*}	4^{l*}	4^{l*}					
13	78^{w*}	34^n	21^r	13^{o*}	10^{l*}	6^{e*}	4^{l*}	4^{l*}	4^{l*}				
14	91^{w**}	$43^{n\dagger}$	25^j	15^{j*}	11^{n*}	8^{d*}	5^{m*}	4^{l*}	4^{l*}	4^{l*}			
15	124^{e*}	$56^{w\dagger}$	31^n	15^{o*}	13^{w**}	10^{m*}	7^{d*}	5^{l*}	4^{l*}	4^{l*}	4^{l*}		
16	140^{l**}	$65^{w\dagger}$	38^w	$24^{w\dagger}$	14^{m*}	11^{w**}	8^{m*}	6^{d*}	4^{l*}	4^{l*}	4^{l*}	4^{l*}	
17	183^{l*}	68^{o**}	44^w	$27^{w\dagger}$	$18^{w\dagger}$	13^{w**}	11^{e*}	7^{d*}	6^{e*}	4^{l*}	4^{l*}	4^{l*}	4^{l*}
18	207^{w*}	94^{e*}	48^{n*}	$33^{w\dagger}$	21^{w**}	16^r	12^m	10^d	6^{m*}	5^{d*}	4^{l*}	4^{l*}	4^{l*}
19	$258^{w\dagger}$	$108^{w\dagger}$	$60^{w\dagger}$	$35^{w\dagger}$	$27^{j\dagger}$	$17^{w\dagger}$	14^h	11^d	9^{d*}	6^{e*}	5^{l*}	4^{l*}	4^{l*}
20	285^{w**}	$133^{w\dagger}$	$71^{w\dagger}$	$45^{w\dagger}$	28^{w**}	$21^{w\dagger}$	15^l	$12^{w\dagger}$	10^m	8^{d*}	6^{m*}	4^{l*}	4^{l*}
21	352^{e*}	$151^{w\dagger}$	77^c	$49^{w\dagger}$	$35^{w\dagger}$	$24^{j\dagger}$	$18^{j\dagger}$	14^h	11^{j*}	9^{d*}	7^{d*}	5^{m*}	4^{l*}
22	385^{w**}	$172^{w\dagger}$	77^{l**}	$59^{w\dagger}$	$38^{w\dagger}$	$29^{w\dagger}$	$19^{j\dagger}$	15^j	11^{m*}	11^e	8^{m*}	6^{d*}	5^{m*}
23	466^{e*}	$187^{w\dagger}$	104^{l*}	$67^{w\dagger}$	$40^{w\dagger}$	$32^{w\dagger}$	24^j	15^{j*}	14^j	11^{e*}	10^d	7^{d*}	6^{e*}
24	510^{w*}	$231^{w\dagger}$	116^d	$78^{w\dagger}$	$50^{w\dagger}$	$35^{w\dagger}$	24^{o*}	$20^{w\dagger}$	14^{m*}	$13^{w\dagger}$	11^m	8^{m*}	6^{m*}
25	600^{w*}	$256^{w\dagger}$	130^w	$83^{w\dagger}$	$57^{w\dagger}$	$38^{w\dagger}$	$30^{w\dagger}$	$23^{w\dagger}$	$17^{w\dagger}$	14^e	$12^{w\dagger}$	10^m	8^{e*}
26	650^{w**}	260^{j**}	130^{o**}	$94^{w\dagger}$	$65^{w\dagger}$	39^j	$33^{w\dagger}$	$26^{w\dagger}$	$18^{w\dagger}$	15^j	13^m	11^d	9^{w**}
27	763^{e*}	319^{e*}	167^{e*}	$105^{w\dagger}$	$70^{w\dagger}$	39^{a*}	$36^{w\dagger}$	$27^{w\dagger}$	$22^{w\dagger}$	15^{j*}	14^w	11^{w**}	11^e
28	819^{w**}	$362^{w\dagger}$	$188^{w\dagger}$	$122^{w\dagger}$	$76^{w\dagger}$	56^e	$36^{w\dagger}$	$32^{w\dagger}$	$24^{w\dagger}$	$19^{j\dagger}$	15^m	$13^{w\dagger}$	11^m
29	950^{e*}	$414^{w\dagger}$	$221^{w\dagger}$	$134^{w\dagger}$	$88^{w\dagger}$	59^d	$42^{w\dagger}$	$33^{w\dagger}$	$27^{w\dagger}$	$21^{w\dagger}$	15^{j*}	14^{w*}	$12^{w\dagger}$
30	1020^{w*}	$461^{w\dagger}$	$225^{w\dagger}$	$142^{w\dagger}$	$97^{w\dagger}$	66^d	$46^{w\dagger}$	$37^{w\dagger}$	30^m	$24^{w\dagger}$	15^{m*}	15^e	$13^{m\dagger}$
31	$1165^{w\dagger}$	$514^{w\dagger}$	$273^{e\dagger}$	$153^{w\dagger}$	$104^{w\dagger}$	$74^{w\dagger}$	$48^{i\dagger}$	$39^{w\dagger}$	$32^{w\dagger}$	$26^{w\dagger}$	$21^{w\dagger}$	15^{e*}	14^{j*}
32	1240^{l**}	$572^{w\dagger}$	$300^{d\dagger}$	$165^{w\dagger}$	$106^{w\dagger}$	$78^{w\dagger}$	$60^{w\dagger}$	$40^{w\dagger}$	32^{w**}	$29^{w\dagger}$	$23^{w\dagger}$	$18^{w\dagger}$	14^{m*}

Table 2: $t = 3$

$v \backslash k$	5	6	7	8	9	10	11	12	13	14	15	16
5												
6	5^{l*}											
7	9^{l*}	5^{l*}										
8	20^{u*}	7^{d*}	5^{l*}									
9	30^{u*}	12^{l*}	6^{l*}	5^{l*}								
10	51^{r*}	20^{r*}	10^{o*}	5^{l*}	5^{l*}							
11	66^{j**}	32^{n*}	17^{t*}	9^{d*}	5^{l*}	5^{l*}						
12	113^{e*}	41^n	24^n	12^{d*}	8^{d*}	5^{l*}	5^{l*}					
13	157^w	66^w	30^n	$18^{r*\dagger}$	10^{d*}	7^{l*}	5^{l*}	5^{l*}				
14	$230^{w\dagger}$	$80^{w\dagger}$	44^r	$24^{w\dagger}$	16^{d*}	9^{m*}	6^{l*}	5^{l*}	5^{l*}			
15	$295^{w\dagger}$	$117^{w\dagger}$	$57^{j\dagger}$	30^j	$20^{w\dagger}$	14^d	8^{d*}	5^{l*}	5^{l*}	5^{l*}		
16	$405^{w\dagger}$	$152^{w\dagger}$	$76^{w\dagger}$	30^{a*}	$26^{w\dagger}$	$18^{w\dagger}$	12^{d*}	7^{m*}	5^{l*}	5^{l*}	5^{l*}	
17	$491^{w\dagger}$	$188^{w\dagger}$	$99^{w\dagger}$	$53^{w\dagger}$	$28^{w\dagger}$	23^n	$15^{w\dagger}$	10^{d*}	7^{e*}	5^{l*}	5^{l*}	5^{l*}
18	$664^{w\dagger}$	$236^{w\dagger}$	$126^{w\dagger}$	$66^{w\dagger}$	$38^{w\dagger}$	$26^{w\dagger}$	$19^{w\dagger}$	12^{l*}	9^{d*}	6^{m*}	5^{l*}	5^{l*}
19	$846^{w\dagger}$	$325^{w\dagger}$	$152^{w\dagger}$	$84^{w\dagger}$	$48^{w\dagger}$	$32^{w\dagger}$	23^d	$17^{w\dagger}$	11^{d*}	9^{e*}	6^{l*}	5^{l*}
20	$1080^{w\dagger}$	$382^{w\dagger}$	$198^{w\dagger}$	$93^{w\dagger}$	$63^{w\dagger}$	$36^{w\dagger}$	$28^{w\dagger}$	20^o	16^d	10^{m*}	8^{d*}	5^{l*}
21	$1247^{w\dagger}$	$490^{w\dagger}$	$235^{w\dagger}$	$124^{w\dagger}$	$75^{w\dagger}$	$49^{w\dagger}$	$31^{i\dagger}$	$25^{w\dagger}$	$18^{w\dagger}$	14^d	9^{m*}	7^{d*}
22	$1573^{w\dagger}$	$580^{h\dagger}$	$252^{w\dagger}$	$156^{w\dagger}$	$96^{w\dagger}$	$54^{w\dagger}$	$38^{w\dagger}$	$28^{w\dagger}$	$22^{w\dagger}$	17^m	12^d	9^{m*}
23	1771^{j**}	$720^{w\dagger}$	253^{l**}	$195^{w\dagger}$	$107^{w\dagger}$	$77^{w\dagger}$	$42^{w\dagger}$	31^j	$25^{w\dagger}$	$20^{w\dagger}$	15^d	11^d
24	2237^{e*}	$784^{w\dagger}$	357^{l*}	$227^{w\dagger}$	$122^{w\dagger}$	$89^{w\dagger}$	$59^{w\dagger}$	31^i	$28^{w\dagger}$	$23^{w\dagger}$	$18^{w\dagger}$	12^m
25	$2622^{w\dagger}$	$992^{j\dagger}$	$440^{d\dagger}$	$263^{w\dagger}$	$163^{w\dagger}$	$98^{w\dagger}$	$70^{w\dagger}$	$47^{w\dagger}$	$30^{w\dagger}$	$27^{w\dagger}$	$21^{w\dagger}$	17^d
26	$3222^{e\dagger}$	$1154^{w\dagger}$	$551^{w\dagger}$	$298^{w\dagger}$	$198^{w\dagger}$	$119^{w\dagger}$	$82^{d\dagger}$	$51^{w\dagger}$	$37^{w\dagger}$	$28^{w\dagger}$	$24^{w\dagger}$	$18^{m\dagger}$
27	$3775^{w\dagger}$	1170^{j**}	$670^{w\dagger}$	$350^{w\dagger}$	$216^{w\dagger}$	$138^{w\dagger}$	$97^{w\dagger}$	$65^{w\dagger}$	$42^{w\dagger}$	31^j	$27^{w\dagger}$	$22^{w\dagger}$
28	$4501^{w\dagger}$	1489^{e*}	$810^{w\dagger}$	$428^{d\dagger}$	$267^{w\dagger}$	$160^{w\dagger}$	$108^{w\dagger}$	$79^{w\dagger}$	$55^{w\dagger}$	31^i	$29^{w\dagger}$	$24^{m\dagger}$
29	$4955^{w\dagger}$	$1803^{j\dagger}$	$916^{w\dagger}$	$512^{w\dagger}$	$314^{w\dagger}$	$198^{w\dagger}$	$118^{w\dagger}$	$90^{d\dagger}$	$63^{w\dagger}$	$43^{w\dagger}$	31^e	$28^{w\dagger}$
30	$5894^{w\dagger}$	$2174^{w\dagger}$	$1076^{w\dagger}$	$560^{w\dagger}$	$366^{w\dagger}$	$231^{w\dagger}$	$144^{w\dagger}$	$102^{w\dagger}$	$74^{w\dagger}$	$50^{w\dagger}$	31^j	$29^{w\dagger}$
31	$6595^{w\dagger}$	$2588^{w\dagger}$	$1122^{w\dagger}$	$617^{w\dagger}$	$435^{w\dagger}$	$278^{w\dagger}$	$161^{w\dagger}$	$115^{w\dagger}$	$80^{w\dagger}$	$63^{d\dagger}$	31^{o*}	30^j
32	$7703^{w\dagger}$	$3027^{w\dagger}$	$1387^{w\dagger}$	620^a	$479^{w\dagger}$	$322^{w\dagger}$	$184^{w\dagger}$	$132^{w\dagger}$	$101^{w\dagger}$	$67^{d\dagger}$	$52^{e\dagger}$	30^{m*}

Table 3: $t = 4$

$v \setminus k$	6	7	8	9	10	11	12	13	14	15	16
6											
7	6^{l*}										
8	12^{l*}	6^{l*}									
9	30^{r*}	9^{o*}	6^{l*}								
10	50^{r*}	20^{d*}	8^{d*}	6^{l*}							
11	100^n	34^{j*}	16^{d*}	7^{l*}	6^{l*}						
12	132^{j**}	59^n	26^{t*}	12^{o*}	6^{l*}	6^{l*}					
13	245^{e*}	$78^{o\dagger}$	$42^{w\dagger}$	19^{d*}	11^{d*}	6^{l*}	6^{l*}				
14	$371^{o\dagger}$	$138^{w\dagger}$	$55^{w\dagger}$	$32^{w\dagger}$	14^{o*}	10^{d*}	6^{l*}	6^{l*}			
15	$578^{w\dagger}$	$189^{w\dagger}$	$89^{w\dagger}$	$42^{w\dagger}$	$27^{o\dagger}$	13^{d*}	9^{d*}	6^{l*}	6^{l*}		
16	$808^{w\dagger}$	$283^{w\dagger}$	$115^{w\dagger}$	$61^{w\dagger}$	$34^{w\dagger}$	22^d	12^{m*}	8^{l*}	6^{l*}	6^{l*}	
17	$1213^{e\dagger}$	$398^{w\dagger}$	$178^{w\dagger}$	$79^{w\dagger}$	$48^{w\dagger}$	$30^{w\dagger}$	17^{d*}	11^{d*}	7^{l*}	6^{l*}	6^{l*}
18	$1546^{w\dagger}$	$548^{w\dagger}$	$256^{w\dagger}$	$113^{w\dagger}$	$54^{w\dagger}$	$42^{w\dagger}$	24^d	15^{d*}	9^{m*}	6^{l*}	6^{l*}
19	$2175^{w\dagger}$	$706^{w\dagger}$	$356^{w\dagger}$	$149^{w\dagger}$	$83^{w\dagger}$	$49^{w\dagger}$	$37^{w\dagger}$	21^d	14^{d*}	9^{e*}	6^{l*}
20	$2850^{w\dagger}$	$980^{w\dagger}$	$441^{w\dagger}$	$220^{w\dagger}$	$108^{w\dagger}$	$65^{w\dagger}$	42^d	$33^{w\dagger}$	18^d	12^{d*}	8^{m*}
21	$3908^{w\dagger}$	$1296^{w\dagger}$	$602^{w\dagger}$	$271^{w\dagger}$	$145^{w\dagger}$	$79^{w\dagger}$	$56^{w\dagger}$	38^d	28^d	16^d	12^{e*}
22	$4681^{w\dagger}$	$1649^{w\dagger}$	$723^{w\dagger}$	$378^{w\dagger}$	$190^{w\dagger}$	$110^{w\dagger}$	$64^{w\dagger}$	$48^{w\dagger}$	34^m	22^o	14^d
23	$6162^{w\dagger}$	$1948^{w\dagger}$	$757^{w\dagger}$	$489^{w\dagger}$	$262^{w\dagger}$	$131^{w\dagger}$	$81^{w\dagger}$	$56^{w\dagger}$	$44^{w\dagger}$	$30^{w\dagger}$	20^d
24	7084^{w**}	$2580^{w\dagger}$	759^{l**}	$615^{w\dagger}$	$297^{w\dagger}$	$194^{w\dagger}$	86^w	$67^{w\dagger}$	$49^{w\dagger}$	$38^{w\dagger}$	24^o
25	9321^{e*}	$2952^{w\dagger}$	1116^{l*}	$717^{w\dagger}$	$391^{w\dagger}$	$232^{w\dagger}$	$145^{e\dagger}$	$73^{w\dagger}$	$56^{w\dagger}$	$47^{d\dagger}$	$35^{w\dagger}$
26	$11570^{w\dagger}$	$3925^{w\dagger}$	$1452^{u\dagger}$	$830^{w\dagger}$	$512^{w\dagger}$	$272^{w\dagger}$	$175^{d\dagger}$	$103^{w\dagger}$	$60^{w\dagger}$	$54^{w\dagger}$	$41^{w\dagger}$
27	$14761^{w\dagger}$	$4619^{w\dagger}$	$1982^{w\dagger}$	$960^{w\dagger}$	$622^{w\dagger}$	$354^{w\dagger}$	$208^{d\dagger}$	$125^{w\dagger}$	$76^{w\dagger}$	$57^{w\dagger}$	$49^{w\dagger}$
28	$18249^{w\dagger}$	4680^{j**}	$2551^{u\dagger}$	$1224^{w\dagger}$	$771^{w\dagger}$	$424^{w\dagger}$	$257^{w\dagger}$	$171^{d\dagger}$	$88^{w\dagger}$	$62^{w\dagger}$	$54^{w\dagger}$
29	$22433^{w\dagger}$	6169^{e*}	$3151^{w\dagger}$	$1608^{w\dagger}$	$920^{w\dagger}$	$561^{w\dagger}$	$296^{w\dagger}$	$218^{w\dagger}$	$137^{w\dagger}$	$67^{w\dagger}$	$61^{w\dagger}$
30	$25015^{w\dagger}$	$7780^{w\dagger}$	$3780^{w\dagger}$	$2009^{w\dagger}$	$1123^{w\dagger}$	$644^{w\dagger}$	$352^{w\dagger}$	$255^{w\dagger}$	$162^{w\dagger}$	$96^{w\dagger}$	62^j
31	$30909^{e\dagger}$	$9946^{w\dagger}$	$4567^{w\dagger}$	$2418^{w\dagger}$	$1339^{w\dagger}$	$799^{w\dagger}$	$429^{w\dagger}$	$293^{w\dagger}$	$194^{w\dagger}$	$128^{w\dagger}$	62^j
32	$35869^{w\dagger}$	$12381^{w\dagger}$	$4820^{w\dagger}$	$2965^{w\dagger}$	$1647^{w\dagger}$	$1001^{w\dagger}$	$557^{w\dagger}$	$363^{w\dagger}$	$240^{w\dagger}$	$156^{w\dagger}$	62^{a*}

Table 4: $t = 5$

$v \backslash k$	7	8	9	10	11	12	13	14	15	16
7										
8	7^{l*}									
9	16^{l*}	7^{l*}								
10	45^{u*}	12^{d*}	7^{l*}							
11	84^{j*}	29^{w*}	10^{d*}	7^{l*}						
12	$176^{w\dagger}$	51^{j*}	22^{d*}	9^{d*}	7^{l*}					
13	264^j	$99^{w\dagger}$	$39^{w\dagger}$	16^{d*}	8^{l*}	7^{l*}				
14	$501^{w\dagger}$	$151^{w\dagger}$	$70^{w\dagger}$	29^{d*}	14^{o*}	7^{l*}	7^{l*}			
15	$825^{w\dagger}$	$281^{w\dagger}$	$99^{w\dagger}$	$51^{w\dagger}$	21^{d*}	13^{d*}	7^{l*}	7^{l*}		
16	$1329^{w\dagger}$	$390^{w\dagger}$	$169^{l\dagger}$	$76^{w\dagger}$	$44^{w\dagger}$	19^{d*}	12^{d*}	7^{l*}	7^{l*}	
17	$2048^{w\dagger}$	$615^{w\dagger}$	$242^{w\dagger}$	$118^{w\dagger}$	$58^{w\dagger}$	$35^{w\dagger}$	17^{d*}	11^{d*}	7^{l*}	7^{l*}
18	$3261^{e\dagger}$	$917^{w\dagger}$	$415^{w\dagger}$	$153^{w\dagger}$	$88^{w\dagger}$	$48^{h\dagger}$	28^d	15^{d*}	10^{d*}	7^{l*}
19	$4414^{w\dagger}$	$1378^{w\dagger}$	$599^{w\dagger}$	$230^{w\dagger}$	$102^{w\dagger}$	$72^{w\dagger}$	42^d	22^d	13^{d*}	9^{l*}
20	$6552^{w\dagger}$	$1995^{j\dagger}$	$915^{w\dagger}$	$343^{w\dagger}$	$172^{w\dagger}$	$89^{w\dagger}$	$64^{w\dagger}$	32^d	19^{d*}	12^{m*}
21	$9219^{w\dagger}$	$2895^{w\dagger}$	$1260^{w\dagger}$	$520^{w\dagger}$	$234^{w\dagger}$	$128^{w\dagger}$	$75^{w\dagger}$	$56^{w\dagger}$	27^d	17^{d*}
22	$13048^{w\dagger}$	$4014^{w\dagger}$	$1685^{w\dagger}$	$735^{w\dagger}$	$347^{w\dagger}$	$164^{w\dagger}$	$106^{w\dagger}$	$66^{j\dagger}$	46^d	24^d
23	$17247^{w\dagger}$	$5645^{w\dagger}$	$2086^{w\dagger}$	$1078^{w\dagger}$	$498^{w\dagger}$	$260^{w\dagger}$	$131^{w\dagger}$	$93^{w\dagger}$	$56^{w\dagger}$	38^d
24	$23276^{w\dagger}$	$7193^{w\dagger}$	$2587^{w\dagger}$	$1453^{w\dagger}$	$720^{w\dagger}$	$352^{w\dagger}$	$206^{w\dagger}$	$108^{w\dagger}$	$83^{d\dagger}$	$49^{w\dagger}$
25	$29594^{w\dagger}$	$9718^{w\dagger}$	$3190^{w\dagger}$	$1799^{w\dagger}$	$924^{w\dagger}$	$493^{w\dagger}$	$254^{w\dagger}$	$138^{w\dagger}$	$99^{w\dagger}$	$70^{w\dagger}$
26	$38911^{w\dagger}$	$12206^{w\dagger}$	$4302^{w\dagger}$	$2045^{w\dagger}$	$1250^{w\dagger}$	$638^{w\dagger}$	$387^{w\dagger}$	$169^{w\dagger}$	$113^{w\dagger}$	$87^{w\dagger}$
27	$50043^{w\dagger}$	$16048^{w\dagger}$	$5518^{w\dagger}$	$2622^{w\dagger}$	$1477^{w\dagger}$	$848^{w\dagger}$	$482^{w\dagger}$	$249^{w\dagger}$	$127^{w\dagger}$	$101^{w\dagger}$
28	$64276^{w\dagger}$	$19493^{w\dagger}$	$7449^{w\dagger}$	$3038^{w\dagger}$	$1903^{w\dagger}$	$1111^{d\dagger}$	$616^{w\dagger}$	$333^{w\dagger}$	$193^{w\dagger}$	$114^{w\dagger}$
29	$82237^{w\dagger}$	$24043^{w\dagger}$	$9744^{w\dagger}$	$4170^{w\dagger}$	$2340^{w\dagger}$	$1452^{w\dagger}$	$775^{w\dagger}$	$436^{w\dagger}$	$250^{w\dagger}$	$145^{w\dagger}$
30	$104474^{w\dagger}$	$30176^{w\dagger}$	$12075^{w\dagger}$	$5490^{w\dagger}$	$3010^{w\dagger}$	$1795^{w\dagger}$	$1004^{w\dagger}$	$589^{w\dagger}$	$333^{w\dagger}$	$178^{w\dagger}$
31	$127248^{w\dagger}$	$37541^{w\dagger}$	$15721^{w\dagger}$	$7117^{w\dagger}$	$3829^{w\dagger}$	$2088^{w\dagger}$	$1253^{w\dagger}$	$719^{w\dagger}$	$442^{w\dagger}$	$267^{w\dagger}$
32	158157^e	$47386^{w\dagger}$	$19539^{w\dagger}$	$9266^{w\dagger}$	$4923^{w\dagger}$	$2699^{w\dagger}$	$1597^{w\dagger}$	$928^{w\dagger}$	$542^{w\dagger}$	286^w

Table 5: $t = 6$

$v \backslash k$	8	9	10	11	12	13	14	15	16
8									
9	8^{l*}								
10	20^{d*}	8^{l*}							
11	63^{u*}	15^{l*}	8^{l*}						
12	126^{j*}	40^{d*}	12^{o*}	8^{l*}					
13	$295^{w\dagger}$	79^n	30^{d*}	11^{d*}	8^{l*}				
14	$471^{j\dagger}$	$163^{w\dagger}$	$56^{w\dagger}$	22^{d*}	10^{d*}	8^{l*}			
15	$971^{j\dagger}$	$276^{w\dagger}$	$112^{w\dagger}$	$42^{u*\dagger}$	18^{d*}	9^{l*}	8^{l*}		
16	$1668^{w\dagger}$	$538^{w\dagger}$	$165^{w\dagger}$	$83^{w\dagger}$	28^{d*}	16^{o*}	8^{l*}	8^{l*}	
17	$2960^{w\dagger}$	$845^{w\dagger}$	$310^{w\dagger}$	$127^{w\dagger}$	$64^{o\dagger}$	26^{d*}	15^{d*}	8^{l*}	8^{l*}
18	$4690^{w\dagger}$	$1259^{w\dagger}$	$509^{w\dagger}$	$212^{w\dagger}$	$101^{u\dagger}$	50^d	24^{d*}	14^{d*}	8^{l*}
19	$7949^{w\dagger}$	$2165^{w\dagger}$	$830^{w\dagger}$	$284^{w\dagger}$	$156^{w\dagger}$	$81^{w\dagger}$	42^d	19^{d*}	13^{d*}
20	$11416^{j\dagger}$	$3413^{w\dagger}$	$1296^{w\dagger}$	$428^{w\dagger}$	$186^{w\dagger}$	$129^{w\dagger}$	60^d	34^d	17^{d*}
21	$17968^{e\dagger}$	$5334^{w\dagger}$	$2163^{w\dagger}$	$692^{w\dagger}$	$315^{w\dagger}$	$161^{w\dagger}$	$112^{d\dagger}$	50^d	28^d
22	$26713^{u\dagger}$	$8024^{w\dagger}$	$3144^{w\dagger}$	$1170^{w\dagger}$	$481^{w\dagger}$	$242^{w\dagger}$	$134^{w\dagger}$	$91^{d\dagger}$	40^d
23	$38962^{w\dagger}$	$11805^{w\dagger}$	$4607^{w\dagger}$	$1764^{w\dagger}$	$745^{w\dagger}$	$321^{w\dagger}$	$203^{w\dagger}$	$110^{w\dagger}$	$75^{w\dagger}$
24	$55810^{u\dagger}$	$17223^{w\dagger}$	$6134^{w\dagger}$	$2705^{w\dagger}$	$1166^{w\dagger}$	$551^{w\dagger}$	$253^{w\dagger}$	$171^{w\dagger}$	$93^{w\dagger}$
25	$78430^{u\dagger}$	$23383^{w\dagger}$	$8437^{w\dagger}$	$3834^{w\dagger}$	$1706^{w\dagger}$	$807^{w\dagger}$	$428^{w\dagger}$	$202^{w\dagger}$	$146^{d\dagger}$
26	$106299^{w\dagger}$	$32856^{w\dagger}$	$10959^{w\dagger}$	$5242^{w\dagger}$	$2466^{w\dagger}$	$1208^{w\dagger}$	$595^{w\dagger}$	$280^{w\dagger}$	$182^{w\dagger}$
27	$145198^{w\dagger}$	$43848^{w\dagger}$	$14964^{w\dagger}$	$6810^{w\dagger}$	$3300^{w\dagger}$	$1716^{w\dagger}$	$889^{w\dagger}$	$385^{w\dagger}$	$233^{w\dagger}$
28	$193057^{u\dagger}$	$59837^{w\dagger}$	$19848^{w\dagger}$	$8895^{w\dagger}$	$4400^{w\dagger}$	$2187^{w\dagger}$	$1219^{w\dagger}$	$603^{w\dagger}$	$307^{w\dagger}$
29	$257324^{e\dagger}$	$76986^{w\dagger}$	$26876^{w\dagger}$	$11542^{w\dagger}$	$5827^{w\dagger}$	$2697^{w\dagger}$	$1681^{w\dagger}$	$827^{w\dagger}$	$472^{w\dagger}$
30	$337198^{u\dagger}$	$100943^{u\dagger}$	$36082^{w\dagger}$	$15333^{w\dagger}$	$7344^{w\dagger}$	$4010^{w\dagger}$	$2054^{w\dagger}$	$1145^{w\dagger}$	$633^{w\dagger}$
31	$428036^{j\dagger}$	$128817^{u\dagger}$	$45800^{w\dagger}$	$19986^{w\dagger}$	$9877^{w\dagger}$	$4870^{w\dagger}$	$2646^{w\dagger}$	$1511^{w\dagger}$	$880^{w\dagger}$
32	554567^e	$165850^{u\dagger}$	$61517^{e\dagger}$	$25131^{w\dagger}$	$12719^{w\dagger}$	$5873^{w\dagger}$	$3330^{w\dagger}$	$2108^{w\dagger}$	$1020^{w\dagger}$

Table 6: $t = 7$

$v \backslash k$	9	10	11	12	13	14	15	16
9								
10	9^{l*}							
11	25^{d*}	9^{l*}						
12	84^{n*}	18^{l*}	9^{l*}					
13	185^{n*}	52^{n*}	15^{d*}	9^{l*}				
14	$471^{w\dagger}$	$115^{w\dagger}$	40^{d*}	13^{d*}	9^{l*}			
15	$789^{n\dagger}$	$253^{w\dagger}$	$80^{w\dagger}$	30^{d*}	12^{d*}	9^{l*}		
16	$1760^{e\dagger}$	$448^{w\dagger}$	$170^{w\dagger}$	$59^{u\dagger}$	24^{d*}	11^{d*}	9^{l*}	
17	$3270^{w\dagger}$	$973^{w\dagger}$	$282^{w\dagger}$	$132^{w\dagger}$	$42^{u\dagger}$	20^{d*}	10^{l*}	9^{l*}
18	$6098^{w\dagger}$	$1550^{w\dagger}$	$550^{w\dagger}$	$206^{w\dagger}$	$92^{w\dagger}$	34^d	18^{o*}	9^{l*}
19	$10551^{w\dagger}$	$2460^{w\dagger}$	$987^{w\dagger}$	$365^{w\dagger}$	$158^{w\dagger}$	$75^{u\dagger}$	31^{d*}	17^{d*}
20	$18497^{w\dagger}$	$4521^{w\dagger}$	$1728^{w\dagger}$	$490^{w\dagger}$	$263^{w\dagger}$	$125^{w\dagger}$	57^d	26^{d*}
21	$28717^{w\dagger}$	$7705^{w\dagger}$	$2711^{w\dagger}$	$759^{w\dagger}$	$346^{w\dagger}$	$211^{w\dagger}$	96^d	$48^{w\dagger}$
22	$46684^{w\dagger}$	$12769^{w\dagger}$	$4782^{w\dagger}$	$1401^{w\dagger}$	$578^{w\dagger}$	$277^{w\dagger}$	$180^{w\dagger}$	71^d
23	$72233^{u\dagger}$	$20301^{w\dagger}$	$7287^{w\dagger}$	$2435^{w\dagger}$	$937^{w\dagger}$	$445^{w\dagger}$	$228^{w\dagger}$	$153^{w\dagger}$
24	$110993^{w\dagger}$	$31495^{w\dagger}$	$11379^{w\dagger}$	$3998^{w\dagger}$	$1573^{w\dagger}$	$592^{w\dagger}$	$368^{w\dagger}$	$196^{w\dagger}$
25	$164792^{u\dagger}$	$48047^{u\dagger}$	$16411^{w\dagger}$	$6353^{w\dagger}$	$2499^{w\dagger}$	$1133^{w\dagger}$	$485^{w\dagger}$	$302^{w\dagger}$
26	$242585^{w\dagger}$	$69829^{u\dagger}$	$23670^{w\dagger}$	$9542^{w\dagger}$	$3944^{w\dagger}$	$1685^{w\dagger}$	$881^{w\dagger}$	$372^{w\dagger}$
27	$343679^{u\dagger}$	100709^w	$33872^{u\dagger}$	$14072^{w\dagger}$	$5755^{w\dagger}$	$2661^{w\dagger}$	$1251^{w\dagger}$	$590^{w\dagger}$
28	480708^w	140417^w	$47723^{u\dagger}$	$19987^{w\dagger}$	$8514^{w\dagger}$	$3912^{w\dagger}$	$1920^{w\dagger}$	$874^{w\dagger}$
29	650404^w	193066^w	$66034^{u\dagger}$	$27560^{w\dagger}$	$12360^{w\dagger}$	$5650^{w\dagger}$	$2650^{w\dagger}$	$1372^{w\dagger}$
30	879517^w	262146^w	$91540^{u\dagger}$	$37468^{w\dagger}$	16849^c	$7714^{w\dagger}$	$3828^{w\dagger}$	$1801^{w\dagger}$
31	1174351^w	351807^w	125202^u	51817^w	$22684^{w\dagger}$	11018^l	$5192^{w\dagger}$	$2638^{w\dagger}$
32	1530641^w	467414^w	167334^u	69961^u	30228^c	$13683^{w\dagger}$	7601^l	$3302^{w\dagger}$

Table 7: $t = 8$