

Neighbor Designs in Circular Blocks of Size Seven

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Abstract

Neighbor Designs (ND) are more useful to remove the Neighbor Effects in experiments where the performance of a treatment is affected by the treatments applied to its adjacent plots. These designs ensure that treatment comparisons will be less affected by Neighbor Effects as possible. Neighbor Designs in circular blocks individually of size five, six, eight and nine are already available in the literature. In this article, Neighbor Designs are constructed in circular binary blocks of size seven. A catalog of these designs is also compiled.

Keywords

Circular binary blocks, Neighbor effects, Neighbor designs, Second and higher Neighbor designs.

1. Introduction

Experiments in agriculture, horticulture and forestry often show Neighbor Effects. In such experiments, Neighbor Balanced Designs are useful to remove the Neighbor Effects. Rees (1967) introduced Neighbor Designs in serology and constructed these designs for v odd. A design for v treatments in b circular blocks (each with k plots) in which each treatment is a Neighbor of every other treatment exactly λ times is said to be Neighbor Design. Ahmed and Akhtar (2008), Azais et al. (1993), Bermond and Faber (1976), Das and Saha (1976), Dey and Chakravarty (1977), Hwang (1973), Iqbal et al. (2009) and Lawless (1971) constructed Neighbor Designs for different cases.

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Ai et al. (2007) constructed some all order Neighbor Balanced Designs for v prime or prime power with $k \leq v$ and suggested that the circular blocks Neighbor Balanced Designs are universally optimal.

Akhtar and Ahmed (2009) proposed some new second and higher order Neighbor Designs in circular binary blocks. Ahmed and Akhtar (2009) proposed a general procedure to construct 1-order Neighbor Balanced Designs. Ahmed et al. (2011) gave a brief review of Neighbor Balanced Designs. Neighbor Designs for all v in linear blocks of size 3 are constructed by Jacroux (1998). Ahmed et al. (2009), Ahmed et al. (2010), Ahmed and Akhtar (2011) and Akhtar et al. (2010) constructed Neighbor Designs in circular blocks of size nine, five, eight and six respectively. In Section 2, construction of Neighbor Designs is developed in circular blocks of size seven. A catalogue of the proposed designs is compiled in Section 3. Designs for the cases where v prime or $(v-1)$ prime are not listed in the catalog because their straight forward construction is given in Section 2. In this catalog, inclusion of some existing designs might be possible.

2. Construction of Neighbor Designs (ND) for $k = 7$

Case I: Neighbor Designs for v odd prime

Theorem 2.1: If $v = ik+1$ prime and $k = 7$ then circular blocks ND can be generated with $\lambda' = 7$ by developing the following $(v-1)/2$ initial blocks cyclically mod v , where λ' is the number of times each treatment is a Neighbor of every other distinct treatment.

$$I_j = (0, j, 2j, 3j, 4j, 5j, 6j) \text{ mod } v ; \quad j = 1, 2, \dots, i.$$

Proof: Combined set of forward and backward differences between Neighboring elements takes all values from 1 to $v-1$ seven times. It is, therefore, ND with $\lambda' = 7$.

Example 2.1: If $v = 23$ and $k = 7$ then ND can be generated by developing the following 11 initial blocks cyclically mod 23.

$$\begin{aligned} I_1 &= (0, 1, 2, 3, 4, 5, 6), & I_2 &= (0, 2, 4, 6, 8, 10, 12), \\ I_3 &= (0, 3, 6, 9, 12, 15, 18), & I_4 &= (0, 4, 8, 12, 16, 20, 1), \\ I_5 &= (0, 5, 10, 15, 20, 2, 7), & I_6 &= (0, 6, 12, 18, 1, 7, 13), \\ I_7 &= (0, 7, 14, 21, 5, 12, 19), & I_8 &= (0, 8, 16, 1, 9, 17, 2), \\ I_9 &= (0, 9, 18, 4, 13, 22, 8), & I_{10} &= (0, 10, 20, 7, 17, 4, 14), \\ I_{11} &= (0, 11, 22, 10, 21, 9, 20) \end{aligned}$$

Case II: Neighbor Designs for $v = ik$

If $v = ik$ and $k = 7$ then ND can be generated with $\lambda' = 2$ by developing i initial blocks (one of these blocks contains $\infty \pmod{v-1}$).

Example 2.2: If $v = 28$ and $k = 7$ then ND can be generated by developing the following four initial blocks cyclically mod 27.

$$\begin{aligned} I_1 &= (0,3,7,12,18,1,13), & I_2 &= (0,1,3,6,10,22,9), \\ I_3 &= (0,5,13,20,1,12,2), & I_4 &= (0,1,8,14,25,7,\infty), \end{aligned}$$

where $\infty = 27$

Case III: Neighbor Designs for $v = ik$; $i (> 1)$ is odd

If $v = ik$, where $i (> 1)$ is odd and $k = 7$ then minimal circular blocks NNBD can be generated with by developing $(i-1)/2$ initial blocks cyclically mod v along with $3v/7$ augmented blocks.

Example 2.3: If $v = 35$ and $k = 7$ then ND can be generated by developing the following two initial blocks cyclically mod 23 with 15 augmented blocks.

$$I_1 = (0,1,3,6,10,16,23), \quad I_2 = (0,8,34,10,26,4,18)$$

Augmented blocks

$$\begin{aligned} &(0,5,10,15,20,25,30), (1,6,11,16,21,26,31), (2,7,12,17,22,27,32), \\ &(3,8,13,18,23,28,33), (4,9,14,19,24,29,34), (0,10,20,30,5,15,25), \\ &(1,11,21,31,6,16,26), (2,12,23,32,7,17,27), (3,13,24,33,8,18,28), \\ &(4,14,25,34,9,19,29), (0,15,30,10,25,5,20), (1,16,31,11,26,6,21), \\ &(2,17,32,12,27,7,22), (3,18,33,13,28,8,23), (4,19,34,14,29,9,24) \end{aligned}$$

Case IV: Neighbor Designs for $v = 2ik + 1$

If $v = 2ik + 1$ and $k = 7$ then minimal circular blocks NNBD can be generated by developing i initial blocks cyclically mod v .

Example 2.4: If $v = 29$ and $k = 7$ then ND can be generated by developing the following two initial blocks cyclically mod 29.

$$I_1 = (0,1,3,6,10,23,8), \quad I_2 = (0,5,12,18,1,20,11)$$

Case V: Neighbor Designs for $v = ik + 1$ and i is odd

If $v = ik + 1$ and $k = 7$ then circular blocks NNBD can be generated with $\lambda' = 2$ by developing i initial blocks cyclically mod v .

Example 2.5: If $v = 36$ and $k = 7$ then ND can be constructed by developing the following five initial blocks cyclically mod 36.

$$I_1 = I_2 = (0, 1, 3, 6, 10, 15, 21), \quad I_3 = I_4 = (0, 7, 15, 24, 34, 9, 22), \\ I_5 = (0, 12, 24, 4, 20, 1, 18)$$

Case VI: Neighbor Designs for v when $(v-1)$ is odd prime

Theorem 2.2: If $v = 6i$ or $v = 6i+2$, $(v-1)$ is odd prime, where $i (>1)$ and $k = 7$ then circular blocks ND can be generated with $\lambda' = 14$ by developing the following v initial blocks (seven of these blocks contain ∞) cyclically mod $(v-1)$.

$$I_j = (0, j, 2j, 3j, 4j, 5j, 6j) \text{ mod } (v-1); \quad j = 1, 2, \dots, m-2. \\ I_{j+m-2} = I_j; \quad j = 1, 2, \dots, m-3. \\ I_{j+m-2} = (0, j, 2j, 3j, 4j, 5j, \infty) \text{ mod } (v-1); \quad j = m-2, m-1, m. \\ I_{j+2m-2} = I_{j+2m-4}; \quad j = 1, 2. \\ I_{2m+1} = (0, 3, 6, 15, 24, 39, \infty) \text{ mod } (v-1) \\ I_{2m+2} = (0, m-2, 2m-3, m-5, 2m-5, m-6, m-6, \infty), \text{ where } m = (v-2)/2, \infty = v-1.$$

Example 2.6: If $v = 24$ and $k = 7$ then ND can be constructed by developing the following 24 initial blocks cyclically mod 23.

$$I_1 = I_{10} = (0, 1, 2, 3, 4, 5, 6), \quad I_2 = I_{11} = (0, 2, 4, 6, 8, 10, 12), \\ I_3 = I_{12} = (0, 3, 6, 9, 12, 15, 18), \quad I_4 = I_{13} = (0, 4, 8, 12, 16, 20, 1), \\ I_5 = I_{14} = (0, 5, 10, 15, 20, 2, 7), \quad I_6 = I_{15} = (0, 6, 12, 18, 1, 7, 13), \\ I_7 = I_{16} = (0, 7, 14, 21, 5, 12, 19), \quad I_8 = I_{17} = (0, 8, 16, 1, 9, 17, 2), \\ I_9 = (0, 9, 18, 4, 13, 22, 8), \quad I_{18} = (0, 9, 18, 4, 13, 22, \infty), \\ I_{19} = I_{21} = (0, 10, 20, 7, 17, 1, \infty), \quad I_{20} = I_{22} = (0, 11, 22, 10, 21, 9, \infty), \\ I_{23} = (0, 3, 6, 15, 1, 16, \infty), \\ I_{24} = (0, 9, 19, 6, 17, 5, \infty), \text{ where } \infty = 23$$

3. Catalog of Neighbor Designs for $k = 7$

v	λ'	Initial Block(s)
8	2	(0,1,3,6,2,5,7)
9	7	(0,1,2,3,4,5,6),(0,2,4,6,8,1,3),(0,4,8,3,7,2,6),(0,1,4,2,5,8,3)
10	14	(0,4,5,7,8,1,2),(0,4,5,7,8,1,2),(0,2,7,3,8,4,5),(0,2,5,8,3,4, ∞),(0,2,5,8,3,4, ∞), (0,2,5,8,3,4, ∞),(0,2,5,8,3,4, ∞),(0,2,5,8,3,4, ∞),(0,2,5,8,3,4, ∞),(0,2,5,8,3,4, ∞)
14	2	(0,1,3,6,10,2,8), (0,1,4,6,10,3, ∞)
15	1	(0,14,1,4,8,13,6)
16	14	(0,14,1,4,8,13,6),(0,14,1,4,8,13,6),(0,14,1,4,8,13,6),(0,14,1,4,8,13,6), (0,14,1,4,8,13,6),(0,14,1,4,8,13,6),(0,14,1,4,8,13,6),(0,7,14,6,8,10,12), (0,7,14,1,3,5,13),(0,1,5,8,13,4, ∞),(0,1,5,8,13,4, ∞),(0,1,5,8,13,4, ∞), (0,1,5,8,13,4, ∞),(0,1,5,8,13,4, ∞),(0,1,5,8,13,4, ∞),(0,6,7,12,4,8, ∞)
21	1	(0,1,3,7,12,19,11) Augmented blocks (0,3,6,9,12,15,18),(1,4,7,10,13,16,19),(2,5,8,11,14,17,20), (0,6,12,18,3,9,15),(1,7,13,19,4,10,16),(2,8,14,20,5,11,17), (0,9,18,6,15,3,12),(0,10,19,7,16,4,13),(0,11,20,8,17,5,14)
21	2	(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,7,15,2,14,4, ∞)
22	2	(0,2,1,8,12,17,11),(0,2,1,8,12,17,11),(0,9,17,5,13,16, ∞) Augmented blocks (0,3,6,9,12,15,18),(1,4,7,10,13,16,19),(2,5,8,11,14,17,20)
25	7	(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11), (0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,7,15,24,14,1,8), (0,7,15,24,14,1,8),(0,7,15,24,14,1,8),(0,9,17,1,11,23,13),(0,9,19,6,15,5,18)
26	14	(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11), (0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11), (0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11), (0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,7,15,6,22,5,12),(0,7,15,6,22,5,12), (0,7,15,6,22,5,12),(0,7,15,6,22,5,12),(0,7,15,6,22,5,12),(0,4,12,21,8,18, ∞), (0,4,12,21,8,18, ∞),(0,4,12,21,8,18, ∞),(0,4,12,21,8,18, ∞),(0,10,20,5,15,2, ∞), (0,10,20,5,15,2, ∞),(0,10,20,7,19,6, ∞)
27	7	(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11), (0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,8,15,1,11,25,7), (0,8,15,1,11,25,7),(0,8,15,1,11,25,7),(0,8,17,2,12,25,10),(0,8,17,2,12,25,10), (0,20,1,9,18,4,13)
33	7	(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11), (0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,1,3,6,10,5,11),(0,26,1,10,20,32,19), (0,26,1,10,20,32,19),(0,26,1,10,20,32,19),(0,26,1,10,20,32,19), (0,26,1,10,20,32,19), (0,26,1,10,20,32,19),(0,15,32,14,31,13,20), (0,17,32,16,31,6,21),(0,18,1,17,27,10,19)

ν	λ'	Initial Block(s)
34	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,13,3,16),(0,7,15,24,13,3,16), (0,7,15,24,13,3,16),(0,7,15,24,13,3,16),(0,7,15,24,13,3,16),(0,7,15,24,13,3,16), (0,7,15,24,13,3,16),(0,7,15,24,13,3,16),(0,7,15,24,13,3,16),(0,7,15,24,13,3,16), (0,7,15,24,13,3,16),(0,7,15,24,13,3,16),(0,7,15,24,13,3,16),(0,14,29,10,25,6, ∞), (0,14,29,10,25,6, ∞),(0,14,29,10,25,6, ∞),(0,14,29,10,25,6, ∞),(0,14,29,10,25,7, ∞), (0,15,30,12,25,8, ∞),(0,7,15,24,1,12, ∞)
35	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,27,1,10,20,31,12), (0,27,1,10,20,31,12),(0,14,28,10,26,9, ∞), where $\infty = 34$
39	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,32,1,31,2,13,25), (0,32,1,31,2,13,25),(0,32,1,31,2,13,25),(0,32,1,31,2,13,25),(0,32,1,31,2,13,25), (0,32,1,31,2,13,25),(0,32,1,31,2,13,25),(0,13,28,5,22,3,16),(0,13,28,5,22,3,16), (0,13,28,5,22,3,16),(0,13,28,5,22,2,19),(0,17,34,10,25,1,20)
40	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,7,15,24,34,6,19),(0,7,15,24,34,6,19), (0,7,15,24,34,6,19),(0,7,15,24,34,6,19),(0,7,15,24,34,6,19),(0,7,15,24,34,6,19), (0,7,15,24,34,6,19),(0,7,15,24,34,6,19),(0,7,15,24,34,6,19),(0,7,15,24,34,6,19), (0,7,15,24,34,6,19),(0,7,15,24,34,6,19),(0,7,15,24,34,6,19),(0,7,15,24,34,6,19), (0,12,26,11,27,5,17),(0,12,26,11,27,5,17),(0,12,26,11,27,5,17), (0,12,26,11,27,5,17), (0,12,26,11,27,5,17),(0,14,29,7,21,36, ∞),(0,14,29,7,21,36, ∞), (0,14,29,7,21,36, ∞),(0,14,29,7,21,36, ∞),(0,12,24,36,9,23, ∞),(0,15,31,8,24,1, ∞), (0,16,32,9,25,2, ∞)
42	2	(0,1,3,6,10,15,23),(0,1,3,6,10,15,23),(0,6,13,22,32,2,14), (0,6,13,22,32,2,14), (0,15,28,2,19,38,16),(0,13,29,5,25,4, ∞), where $\infty = 41$
43	1	(0,1,3,6,10,15,23),(0,7,19,28,38,6,25),(0,6,20,35,8,34,21)
45	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,1,14), (0,7,15,24,34,1,14),(0,7,15,24,34,1,14),(0,7,15,24,34,1,14),(0,7,15,24,34,1,14), (0,7,15,24,34,1,14),(0,7,15,24,34,1,14),(0,11,41,12,29,3,23),(0,11,41,12,29,3,23), (0,11,41,12,29,3,23),(0,11,41,12,29,3,23),(0,11,41,12,29,3,23), (0,11,41,12,29,3,23),(0,18,36,9,20,5,23),(0,18,36,7,24,44,26)
46	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,1,14),(0,7,15,24,34,1,14), (0,7,15,24,34,1,14),(0,7,15,24,34,1,14),(0,7,15,24,34,1,14),(0,7,15,24,34,1,14), (0,7,15,24,34,1,14),(0,11,41,12,29,3,23),(0,11,41,12,29,3,23), (0,11,41,12,29,3,23),(0,11,41,12,29,3,23),(0,11,41,12,29,3,23),

v	λ'	Initial Block(s)
46	14	(0,11,41,12,29,3,23),(0,11,41,12,29,3,23),(0,11,41,12,29,3,23), (0,11,41,12,29,3,23),(0,11,41,12,29,3,23),(0,11,41,12,29,3,23), (0,11,26,42,14,33, ∞),(0,11,26,42,14,33, ∞),(0,11,26,42,14,33, ∞), (0,18,38,11,29,2, ∞),(0,18,38,11,29,2, ∞),(0,18,38,11,29,2, ∞),(0,18,36,13,35,12, ∞)
49	1	(0,1,3,6,10,15,23),(0,6,16,25,36,48,15),(0,13,30,12,31,2,24) Augmented blocks (0,7,14,21,28,35,42),(1,8,15,22,29,36,43),(2,9,16,23,30,37,44), (3,10,17,24,31,38,45),(4,11,18,25,32,39,46),(5,12,19,26,33,40,47), (6,13,20,27,34,41,48),(0,14,28,42,7,21,35),(1,15,29,43,8,22,36), (2,16,30,44,9,23,37),(3,17,31,45,10,24,38),(4,18,32,46,11,25,39), (5,19,33,47,12,26,40),(6,20,34,48,13,27,41),(0,21,42,14,35,7,28), (1,22,43,15,36,8,29),(2,23,44,16,37,9,30),(3,24,45,17,38,10,31), (4,25,46,18,39,11,32),(5,26,47,19,40,12,33),(6,27,48,20,41,13,34)
49	2	(0, 1, 3,6,10,15,21),(0, 1, 3,6,10,15,21),(0, 7, 15,24,34,45,12),(0,7,15,24,34,45,12), (0,13,30,1,19,39,16),(0,13,30,1,19,39,16), (0,14,40,6,28,4, ∞), where $\infty = 48$
50	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,8,17,27,38,1,14),(0,8,17,27,38,1,14), (0,15,31,14,32,2,22),(0,15,31,14,32,2,22),(0,23,46,21,45,3, ∞), where $\infty = 49$ Augmented blocks (0, 7, 14,21,28,35,42), (1, 8,15,22,29,36,43), (2, 9,16,23,30,37,44), (3,10,17,24,31,38,45),(4,11,18,25,32,39,46),(5,12,19,26,33,40,47), (6,13,20,27,34,41,48)
51	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,45,33), (0,7,15,24,34,45,33),(0,7,15,24,34,45,33),(0,7,15,24,34,45,33), (0,7,15,24,34,45,33), (0,7,15,24,34,45,33),(0,7,15,24,34,45,33), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,20,42,15,40,9,31),(0,20,42,15,40,9,31),(0,17,39,15,40,11,35), (0,22,46,19,44,18,32),(0,13,28,48,25,1,26)
52	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,45,33),(0,7,15,24,34,45,33), (0,7,15,24,34,45,33),(0,7,15,24,34,45,33),(0,7,15,24,34,45,33), (0,7,15,24,34,45,33), (0,7,15,24,34,45,33), (0,7,15,24,34,45,33), (0,7,15,24,34,45,33),(0,7,15,24,34,45,33),(0,7,15,24,34,45,33), (0,7,15,24,34,45,33),(0,7,15,24,34,45,33),(0,7,15,24,34,45,33), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,13,27,42,26,9,28), (0,13,27,42,26,9,28),(0,13,27,42,26,9,28),(0,20,42,15,40,9,31),

ν	λ'	Initial Block(s)
52	14	(0,20,42,15,40,9,31),(0,20,42,15,40,9,31),(0,20,42,15,40,9, ∞), (0,20,42,15,40,9, ∞),(0,20,42,13,37,10, ∞),(0,22,46,20,45,19, ∞), (0,22,46,20,45,19, ∞),(0,25,50,24,46,17, ∞),(0,24,48,21,45,18, ∞)
53	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,46,1,45,2,13,25),(0,46,1,45,2,13,25), (0,46,1,45,2,13,25),(0,46,1,45,2,13,25),(0,46,1,45,2,13,25),(0,46,1,45,2,13,25), (0,46,1,45,2,13,25),(0,39,52,14,36,13,37),(0,39,52,14,36,13,37), (0,39,52,14,36,13,37),(0,39,52,14,36,13,37),(0,39,52,14,36,13,37), (0,39,52,14,36,13,37),(0,39,52,14,36,13,37),(0,17,35,1,21,47,20), (0,17,35,1,21,47,20),(0,17,35,1,21,47,20),(0,19,37,1,36,18,35), (0,17,34,15,21,40,19),(0,1,3,6,11,31,4)
55	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,14,29,13,30,48,26), (0,14,29,13,30,48,26),(0,14,29,13,30,48,26),(0,14,29,13,30,48,26), (0,14,29,13,30,48,26),(0,14,29,13,30,48,26),(0,14,29,13,30,48,26), (0,19,42,11,36,8,31),(0,19,42,11,36,8,31),(0,19,42,11,36,8,31), (0,36,13,32,1,29,42),(0,42,12,37,10,29,42),(0,5,35,8,21,49,19),(0,2,1,53,4,8,21)
56	2	(0, 1, 3, 6, 10,15,21), (0, 1, 3, 6,10,15,21), (0, 7, 15, 24,34,45,33), (0,7,15,24,34,45,33),(0,13,27,12,28,53,24),(0,13,27,12,28,53,24), (0,17,54,18,38,6,23),(0,18,37,2,29,1, ∞), where $\infty = 55$
57	1	(0, 1,3,6,10,15,21), (0, 7,16,24,34,45,15),(0,12,25,39,55,15,33),(0,19,39,4,27,2,28)
58	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,13,27,42,26,43,25),(0,13,27,42,26,43,25),(0,13,27,42,26,43,25), (0,13,27,42,26,43,25),(0,13,27,42,26,43,25),(0,13,27,42,26,43,25), (0,13,27,42,26,43,25),(0,13,27,42,26,43,25),(0,13,27,42,26,43,25), (0,13,27,42,26,43,25),(0,13,27,42,26,43,25),(0,13,27,42,26,43,25), (0,13,27,42,26,43,25),(0,13,27,42,26,43,25),(0,19,39,3,27,1,28), (0,19,39,3,27,1,28),(0,19,39,3,27,1,28),(0,19,39,3,27,1,28),(0,19,39,3,27,1,28), (0,19,39,3,27,1,28),(0,19,39,3,27,1,28),(0,19,39,3,27,1,28),(0,19,39,3,27,1,28), (0,19,39,3,27,53, ∞),(0,19,39,3,27,53, ∞),(0,19,39,3,27,53, ∞),(0,19,39,3,27,53, ∞), (0,19,39,3,27,53, ∞),(0,27,55,25,53,23, ∞),(0,27,55,25,53,24, ∞)

v	λ'	Initial Block(s)
63	1	(0, 1,3,6,10,15,21), (0, 13,21,28,38,27,39), (0,14,29,45,62,18,38), (0,22,45,8,36,2,32) Augmented blocks (0,9,18,27,36,45,54),(1,10,19,28,37,46,55),(2,11,20,39,38,47,56), (3,12,21,30,39,48,57),(4,13,22,31,40,49,58),(5,14,23,32,41,50,59), (6,15,24,33,42,51,60),(7,16,25,34,43,52,61),(8,17,26,35,44,53,62), (0,18,36,54,9,27,45),(1,19,37,55,10,28,46),(2,20,38,56,11,29,47), (3,21,39,57,12,30,48),(4,22,40,58,13,31,49),(5,23,41,59,14,32,50), (6,24,42,60,15,33,51),(7,25,43,61,16,34,52),(8,26,44,62,17,35,53), (0,27,54,18,45,9,36),(1,28,55,19,46,10,37),(2,29,56,20,47,11,38), (3,30,57,21,48,12,39),(4,31,58,22,49,13,40),(5,32,59,23,50,14,41), (6,33,60,24,51,15,42),(7,34,61,25,52,16,43),(8,35,62,26,53,17,44)
63	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,45,33),(0,7,15,24,34, 45,33),(0,13,61,14,30,55,19),(0,13,61,14,30,55,19), (0,45,1,21,43,4,28), (0,45,1,21,43,4,28), (0,27,54,22,52,21, ∞), where $\infty = 62$
64	2	(0,1,3,6,10,15,21), (0,1,3,6,10,15,21), (0, 13,21,28,38,27,39), (0, 13,21,28, 38,27,39),(0,14,29,45,62,17,36),(0,14,29,45,62,17,36),(0,20,42,2,27,1,29), (0,20,42,2,27,1,29),(0,30,60,28,59,59, ∞), where $\infty = 63$ Augmented blocks (0,9,18,27,36,45,54),(1,10,19,28,37,46,55),(2,11,20,39,38,47,56), (3,12,21,30,39,48,57),(4,13,22,31,40,49,58),(5,14,23,32,41,50,59), (6,15,24,33,42,51,60),(7,16,25,34,43,52,61),(8,17,26,35,44,53,62)
65	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,14,30,45,28,9,29),(0,14,30,45,28,9,29),(0,14,30,45,28,9,29), (0,14,30,45,28,9,29),(0,14,30,45,28,9,29),(0,14,30,45,28,9,29), (0,14,30,45,28,9,29),(0,22,45,5,31,4,41),(0,22,45,5,31,4,41),(0,22,45,5,31,4,41), (0,22,45,5,31,4,41),(0,22,45,5,31,4,41),(0,22,45,5,31,4,41),(0,22,45,5,31,4,41), (0,52,5,37,3,16,34),(0,52,5,37,3,16,34),(0,52,5,37,3,16,34),(0,52,5,37,3,16,34), (0,52,5,37,3,16,34), (0,52,5,37,3,16,34),(0,52,5,37,3,16,34),(0,13,46,64,31,63,32) (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29),

ν	λ'	Initial Block(s)
66	14	(0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,14,30,13,59,9,29), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,22,45,5,31,4,41), (0,52,5,37,3,16,34), (0,52,5,37,3,16,34), (0,52,5,37,3,16,34), (0,13,31,63,29,42, ∞), (0,13,31,63,29,42, ∞), (0,13,31,63,29,42, ∞), (0,13,31,63,29,42, ∞), (0,18,36,3,35,2, ∞), (0,18,36,3,35,2, ∞), (0,32,63,29,60,26, ∞)
69	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,7,65,8,27),(0,8,17,7,65,8,27), (0,8,17,7,65,8,27),(0,8,17,7,65,8,27),(0,8,17,7,65,8,27),(0,8,17,7,65,8,27), (0,8,17,7,65,8,27),(0,15,31,48,66,10,30),(0,15,31,48,66,10,30), (0,15,31,48,66,10,30),(0,15,31,48,66,10,30),(0,15,31,48,66,10,30), (0,15,31,48,66,10,30),(0,15,31,48,66,10,30),(0,23,47,3,29,1,32), (0,23,47,3,29,1,32),(0,23,47,3,29,1,32),(0,23,47,3,29,1,32),(0,23,47,3,29,1,32), (0,23,47,3,29,1,32),(0,23,47,3,29,1,32),(0,7,21,68,28,64,29),(0,7,21,68,28,64,29), (0,7,21,68,28,64,29),(0,7,21,43,8,1,36),(0,1,3,9,6,39,34),(0,4,11,25,47,14,21),
70	2	(0, 1, 3,6,10,15,21), (0, 1, 3,6,10,15,21), (0, 7, 15,24,34,45,33), (0,7,15,24,34,45,33),(0,13,27,42,58,6,24),(0,13,27,42,58,6,24), (0,50,1,23,46,2,28), (0,50,1,23,46,2,28), (0,27,56,17,48,11,48), (0,29,59,22,56,21, ∞), where $\infty = 69$
71	1	(0,1,3,6,10,15,21),(0,7,15,24,34,45,57),(0,13,28,44,61,8,27), (0,20,42,65,27,61,25),(0,57,41,69,40,70,30)
75	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,15,31,48,66,10,30),(0,15,31,48,66,10,30),(0,15,31,48,66,10,30), (0,15,31,48,66,10,30),(0,15,31,48,66,10,30),(0,15,31,48,66,10,30), (0,15,31,48,66,10,30),(0,24,49,0,27,55,33),(0,24,49,0,27,55,33), (0,24,49,0,27,55,33),(0,24,49,0,27,55,33),(0,24,49,0,27,55,33), (0,24,49,0,27,55,33),(0,24,49,0,27,55,33),(0,46,2,25,57,23,37), (0,46,2,25,57,23,37),(0,46,2,25,57,23,37),(0,46,2,25,57,23,37), (0,46,2,25,57,23,37),(0,46,2,25,57,23,37),(0,7,14,21,28,63,23),

v	λ'	Initial Block(s)
76	14	<p>(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,7,14,45,38,3,37),(0,29,64,24,56,21,35) (0,8,17,27,16,28,35),(0,8,17,27,16,28,35),(0,8,17,27,16,28,35), (0,8,17,27,16,28,35),(0,8,17,27,16,28,35),(0,8,17,27,16,28,35), (0,8,17,27,16,28,35),(0,8,17,27,16,28,35),(0,8,17,27,16,28,35), (0,8,17,27,16,28,35),(0,8,17,27,16,28,35),(0,8,17,27,16,28,35), (0,13,27,12,28,11,29),(0,13,27,12,28,11,29),(0,13,27,12,28,11,29), (0,13,27,12,28,11,29),(0,13,27,12,28,11,29),(0,13,27,12,28,11,29), (0,13,27,12,28,11,29),(0,13,27,12,28,11,29),(0,13,27,12,28,11,29), (0,13,27,12,28,11,29),(0,13,27,12,28,11,29),(0,13,27,12,28,11,29), (0,13,27,12,28,11,29),(0,13,27,12,28,11,29),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,26,53,6,36,5,37), (0,26,53,6,36,5,37),(0,26,53,6,36,5,37),(0,26,53,6,36,5,37), (0,26,53,6,36,5,37),(0,26,53,6,36,5,37), (0,26,53,6,36,5,37), (0,26,53,6,36,5,37), (0,26,53,6,36,5,37),(0,26,53,6,36,5,37), (0,26,53,6,36,5,37), (0,26,53,6,36,5,37), (0,26,53,6,36,5,37),(0,33,69,27,63,21,∞), (0,33,69,27,63,21,∞), (0,33,69,27,63,21,∞),(0,33,69,27,63,21,∞), (0,36,72,33,69,30,∞), (0,36,69,27,59,21,∞),(0,26,53,6,36,67,∞)</p>
77	1	<p>(0,1,3,6,10,15,21), (0,8,17,27,15,28,42), (0,15,31,48,66,8,28), (0,54,1,26,52,2,31), (0,47,2,36,73,32,39)</p> <p>Augmented blocks</p> <p>(0,11,22,33,44,55,66),(1,12,23,34,45,56,67),(2,13,24,35,46,57,68), (3,14,25,36,47,58,69),(4,15,26,37,48,59,70),(5,16,27,38,49,60,71), (6,17,28,39,40,61,72),(7,18,29,40,41,62,73),(8,19,30,41,42,63,74), (9,20,31,42,43,64,75),(10,21,32,43,44,65,76),(0,22,44,66,11,33,55), (1,23,45,67,12,34,56),(2,24,46,68,13,35,57),(3,25,47,69,14,36,58), (4,26,48,70,15,37,59),(5,27,49,71,16,38,60),(6,28,50,72,17,39,61), (7,29,51,73,18,40,62),(8,30,52,74,19,41,63),(9,31,53,75,20,42,64), (10,32,54,76,21,43,65),(0,33,66,22,55,11,44),(1,34,67,23,56,12,45), (2,35,68,24,57,13,46),(3,36,69,25,58,14,47),(4,37,70,26,59,15,48), (5,38,71,27,60,16,49),(6,39,72,28,61,17,50),(7,40,73,29,62,18,51), (8,41,74,30,63,19,52),(9,42,75,31,64,20,53),(10,43,76,32,65,21,54)</p>
77	2	<p>(0, 1, 3, 6, 10,15,21), (0, 1, 3, 6,10,15,21), (0, 7, 15, 24,34,45,57), (0,7,15,24,34,45,57),(0,13,27,42,58,75,22),(0,13,27,42,58,75,22), (0, 58,2,26,51,11,48), (0, 58,2,26,51,11,48), (0,26,53,6,36,67,35),</p>

ν	λ'	Initial Block(s)
77	2	(0,26,53,6,36,67,35),(0,33,66,24,58,20, ∞), where $\infty = 76$
78	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,27,39,26,40),(0,8,17,27,39,26,40), (0,15,31,48,66,8,28), (0,15,31,48,66,8,28), (0,55,1,25,50,76,29), (0,55,1,25,50,76,29), (0,7,40,8,39,73,38), (0,7,40,8,39,73,38), (0,11,47,6,33,60, ∞), where $\infty = 77$
81	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,15,31,48,66,4,24),(0,15,31,48,66,4,24),(0,15,31,48,66,4,24), (0,15,31,48,66,4,24),(0,15,31,48,66,4,24),(0,15,31,48,66,4,24), (0,15,31,48,66,4,24),(0,23,48,22,49,21,50),(0,23,48,22,49,21,50), (0,23,48,22,49,21,50),(0,23,48,22,49,21,50),(0,23,48,22,49,21,50), (0,23,48,22,49,21,50),(0,33,80,34,79,42,74),(0,33,80,34,79,42,74), (0,33,80,34,79,42,74),(0,33,80,34,79,42,74),(0,33,80,34,79,42,74), (0,33,80,34,79,42,74),(0,33,80,34,79,42,74),(0,14,36,6,49,8,22), (0,14,36,6,49,8,22),(0,14,36,6,49,8,22),(0,14,36,6,49,8,38),(0,29,59,18,56,13,54), (0,23,48,74,33,61,31)
82		(0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,1,80,2,79,3,39), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,7,15,24,34,23,35), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,14,27,12,76,13,29), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,19,39,17,40,16,41), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,26,53,23,51,1,33), (0,34,71,27,33,39,60), (0,34,71,27,33,39,60), (0,34,71,27,33,39,60), (0,34,71,27,33,39,60), (0,34,71,27,33,39,60), (0,34,68,25,63,69, ∞),

v	λ'	Initial Block(s)
82		(0,34,68,25,63,69, ∞), (0,34,68,25,63,69, ∞), (0,34,68,25,63,69, ∞), (0,37,74,31,69,9, ∞), (0,37,74,31,69,9, ∞), (0,34,72,29,50,71, ∞)
84	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,45,57),(0,7,15,24,34,45, 57),(0,13,27,42,58,75,19),(0,13,27,42,58,75,19),(0,18,38,60,0,24,49),(0,18, 38,60,0,24,49),(0,38,67,14,45,13,46),(0,38,67,14,45,13,46),(0,28,63,16,57,13,55), (35,71,27,67,24, ∞), where $\infty = 83$
85	1	(0,1,3,6,10,15,21), (0,7,15,24,34,45,57), (0,13,27,42,58,75,31), (0,18,37,57,79,56,32),(0,30,63,12,47,83,43),(0,25,51,22,60,21,58)
86	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37), (0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37), (0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37), (0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,27,1,29,59,5,37),(0,29,62,11,47,7,49), (0,29,62,11,47,7,49),(0,29,62,11,47,7,49),(0,29,62,11,47,7,49), (0,29,62,11,47,7,49),(0,29,62,11,47,7,49),(0,29,62,11,47,7,49), (0,29,58,6,39,72,38),(0,29,58,6,39,72,38),(0,29,63,16,54,9, ∞), (0,29,63,16,54,9, ∞),(0,29,63,16,54,9, ∞),(0,38,76,31,73,30, ∞), (0,38,76,31,73,30, ∞),(0,38,76,31,73,30, ∞),(0,33,67,16,56,13, ∞) (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,15,31,48,66,85,40), (0,15,31,48,66,85,40), (0,15,31,48,66,85,40),

ν	λ'	Initial Block(s)
87	7	(0,15,31,48,66,85,40), (0,15,31,48,66,85,40), (0,15,31,48,66,85,40), (0,15,31,48,66,85,40), (0,23,57,35,60,86,36), (0,23,57,35,60,86,36), (0,23,57,35,60,86,36), (0,23,57,35,60,86,36), (0,23,57,35,60,86,36), (0,23,57,35,60,86,36), (0,28,57,1,31,51,24), (0,28,57,1,31,51,24), (0,28,57,1,31,51,24), (0,28,57,1,31,51,24), (0,28,57,1,31,51,24), (0,28,57,1,31,51,24), (0,28,57,1,31,51,24), (0,33,1,53,4,50,7), (0,33,1,53,4,50,7), (0,33,1,53,4,50,7), (0,33,1,53,4,50,7), (0,33,1,53,4,50,7), (0,33,1,53,4,50,7), (0,14,28,42,75,2,43), (0,14,28,35,21,56,24)
88	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,26,86,27,57,1,33),(0,26,86,27,57,1,33), (0,26,86,27,57,1,33),(0,26,86,27,57,1,33),(0,26,86,27,57,1,33), (0,26,86,27,57,1,33),(0,26,86,27,57,1,33),(0,26,86,27,57,1,33), (0,26,86,27,57,1,33),(0,26,86,27,57,1,33),(0,26,86,27,57,1,33), (0,26,86,27,57,1,33),(0,26,86,27,57,1,33),(0,26,86,27,57,1,33), (0,26,86,27,57,1,33),(0,26,86,27,57,1,33),(0,26,86,27,57,1,33), (0,29,63,12,49,4,47),(0,29,63,12,49,4,47),(0,29,63,12,49,4,47), (0,29,63,12,49,4,47),(0,29,63,12,49,4,47),(0,29,63,12,49,4,47), (0,29,63,12,49,4,47),(0,29,63,12,49,4,47),(0,29,63,12,49,4,47), (0,29,63,12,49,4,47),(0,29,63,12,49,4,47),(0,29,63,12,49,4, ∞), (0,29,63,12,49,4, ∞),(0,29,63,12,49,4, ∞),(0,43,83,34,72,23, ∞), (0,43,83,34,72,23, ∞),(0,43,83,34,72,23, ∞),(0,38,76,27,65,16, ∞) (0, 1, 3,6,10,15,21), (0, 7, 15,24,34,45,57), (0, 41, 55,70,86,12,30) (0,19,39,61,84,17,42),(0,33,68,13,50,90,44),(0,27,55,84,25,56,89) Augmented blocks (0, 13,26,39,52,65,78), (1, 14, 27,40,53,66,79), (2, 15,28,41,54,67,80),

v	λ'	Initial Block(s)
91	1	(3, 16, 29,42,55,68,81), (4, 17,30,43,56,69,82), (5, 18,31,44,57,70,83), (6, 19,32,45,58,71,84), (7, 20,33,46,59,72,85), (8, 21, 34,47,60,73,86), (8, 21, 34,47,60,73,86),(9, 22,35,48,61,74,87),(10, 23,36,49,62,75,88), (11,24,37,50,63,76,89),(12, 25,38,51,64,77,90),(0, 26,52,78,13,39,65), (1, 27,53,79,14,40,66), (2, 28,54,80,15,41,67), (3, 29, 55,81,16,42,68), (4, 30,56,82,17,43,69), (5, 31,57,83,18,44,70), (6, 32, 58,84,19,45,71), (7, 33,59,85,20,46,72), (8, 34,60,86,21,47,73), (9, 35, 61,87,22,48,74), (10,36,62,88,23,49,75),(11,37,63,89,24,50,76),(11,37,63,89,24,50,76), (0, 39,78,26,65,13,52), (1, 40,79,27,66,14,53), (2, 41,80,28,67,15,54), (3,42,81,29,68,16,55),(4,43,82,30,69,17,56)
91	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,45,57),(0,7,15,24,34,45, 57), (0, 13,27,42,58,41,59), (0, 13,27,42,58,41,59), (0, 19,39,61,84,18,43), (0,19,39,61,84,18,43), (0,64,1,29,58,88,32), (0,64,1,29,58,88,32),(0,35,71, 18,56,5,46),(0,35,71,18,56,5,46),(0,40,80,32,74,29, ∞), where $\infty = 90$
92	2	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,13,27,42,58,41,59),(0,13,27,42,58,41,59), (0,19,39,61,84,16,41),(0,19,39,61,84,16,41), (0,26,90,27,57,89,31), (0,26,90,27,57,89,31),(0,36,73,19,58,18,65),(0,36,73,19,58,18,65), (0,12,54,4,47,90,44),(0,7,15,24,34,23,35),(0,85,1,84,2,13,57)
93	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,15,31,48,66,85,20),(0,15,31,48,66,85,20),(0,15,31,48,66,85,20), (0,15,31,48,66,85,20),(0,15,31,48,66,85,20),(0,15,31,48,66,85,20), (0,15,31,48,66,85,20),(0,23,47,72,5,32,61),(0,23,47,72,5,32,61), (0,23,47,72,5,32,61),(0,23,47,72,5,32,61),(0,23,47,72,5,32,61), (0,23,47,72,5,32,61),(0,23,47,72,5,32,61),(0,31,64,5,40,4,41),(0,31,64,5,40,4,41), (0,31,64,5,40,4,41),(0,31,64,5,40,4,41),(0,31,64,5,40,4,41),(0,31,64,5,40,4,41), (0,40,2,44,87,38,86),(0,40,2,44,87,38,86),(0,40,2,44,87,38,86), (0,40,2,44,87,38,86),(0,40,2,44,87,38,86),(0,40,2,44,87,38,86), (0,40,2,44,87,38,86),(0,14,36,66,19,41,71),(0,14,36,66,19,41,71), (0,14,36,66,3,49,63),(0,14,28,74,27,73,26),(0,31,64,6,42,5,52) (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),
94	14	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39),

ν	λ'	Initial Block(s)
94	14	(0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,26,53,81,18,80,48),(0,26,53,81,18,80,48), (0,26,53,81,18,80,48),(0,26,53,81,18,80,48),(0,26,53,81,18,80,48), (0,26,53,81,18,80,48),(0,26,53,81,18,80,48),(0,26,53,81,18,80,48), (0,26,53,81,18,80,48),(0,26,53,81,18,80,48),(0,26,53,81,18,80,48), (0,26,53,81,18,80,48),(0,26,53,81,18,80,48),(0,26,53,81,18,80,48), (0,33,67,10,47,9,49),(0,33,67,10,47,9,49),(0,33,67,10,47,9,49), (0,33,67,10,47,9,49),(0,33,67,10,47,9,49),(0,33,67,10,47,9,49), (0,33,67,10,47,9,49),(0,33,67,10,47,9,49),(0,33,67,10,47,9,49), (0,33,67,10,47,9,49),(0,33,67,10,47,9,49),(0,33,67,10,47,9,49), (0,33,67,10,47,9,49),(0,33,67,10,47,9,49),(0,29,80,16,58,7,50), (0,29,80,16,58,7,50),(0,29,80,16,58,7,50),(0,29,58,16,59,9, ∞), (0,29,58,16,59,9, ∞),(0,29,58,16,59,9, ∞),(0,29,58,16,59,9, ∞), (0,46,92,45,91,44, ∞),(0,46,92,45,91,44, ∞),(0,42,88,41,87,40, ∞)
95	7	(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,8,17,27,38,26,39), (0,8,17,27,38,26,39),(0,8,17,27,38,26,39),(0,15,31,48,66,85,31), (0,15,31,48,66,85,31),(0,15,31,48,66,85,31),(0,15,31,48,66,85,31), (0,15,31,48,66,85,31),(0,15,31,48,66,85,31),(0,15,31,48,66,85,31), (0,20,43,67,92,23,50),(0,20,43,67,92,23,50),(0,20,43,67,92,23,50), (0,20,43,67,92,23,50),(0,20,43,67,92,23,50),(0,20,43,67,92,23,50), (0,20,43,67,92,23,50),(0,67,1,33,66,5,40),(0,67,1,33,66,5,40),(0,67,1,33,66,5,40), (0,67,1,33,66,5,40),(0,67,1,33,66,5,40),(0,67,1,33,66,5,40),(0,67,1,33,66,5,40), (0,42,78,20,77,21,73),(0,42,78,20,77,21,73),(0,42,78,20,77,21,73), (0,42,78,20,77,21,73),(0,42,78,20,77,21,73),(0,42,78,20,77,21,73), (0,42,78,20,77,21,73),(0,14,7,37,88,39,46),(0,14,7,37,88,39,46),
96	14	(0,14,7,37,88,39,46),(0,30,76,11,41,92,44),(0,14,28,58,44,91,47), (0,14,7,58,10,57,9),(0,39,29,40,48,60,47),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,1,3,6,10,15,21), (0,1,3,6,10,15,21),(0,1,3,6,10,15,21),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35),

v	λ'	Initial Block(s)
96	14	(0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,7,15,24,34,23,35),(0,7,15,24,34,23,35),(0,7,15,24,34,23,35), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,82,68,83,4,21,39), (0,82,68,83,4,21,39),(0,82,68,83,4,21,39),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,19,39,17,40,16,41),(0,19,39,17,40,16,41), (0,19,39,17,40,16,41),(0,26,53,81,16,80,48),(0,26,53,81,16,80,48), (0,26,53,81,16,80,48),(0,26,53,81,16,80,48),(0,26,53,81,16,80,48), (0,26,53,81,16,80,48),(0,26,53,81,16,80,48),(0,26,53,81,16,80,48), (0,26,53,81,16,80,48),(0,26,53,81,16,80,48),(0,26,53,81,16,80,48), (0,26,53,81,16,80,48),(0,26,53,81,16,80,48),(0,26,53,81,16,80,48), (0,33,67,8,45,83,43),(0,33,67,8,45,83,43),(0,33,67,8,45,83,43), (0,33,67,8,45,83,43),(0,33,67,8,45,83,43),(0,33,67,8,45,83,43), (0,33,67,8,45,83,43),(0,33,67,8,45,83,43),(0,33,67,8,45,83,43), (0,33,67,8,45,83,43),(0,33,67,8,45,83,43),(0,33,67,8,45,83,43), (0,33,67,8,45,83,43),(0,33,67,8,45,83,43),(0,29,58,9,53,3,45), (0,29,58,9,53,3,45),(0,29,58,9,53,3,45),(0,29,58,9,53,3,45), (0,29,58,9,53,3,45),(0,29,75,26,70,19, ∞),(0,29,75,26,70,19, ∞), (0,29,75,26,70,19, ∞),(0,29,75,26,70,19, ∞),(0,42,84,31,73,23, ∞), (0,42,84,31,73,23, ∞),(0,46,90,40,85,32, ∞)
98	2	(0, 1, 3, 6, 10,15,21), (0, 1, 3, 6, 10,15,21), (0, 7, 15, 24, 34,45,57), (0,7,15,24,34,45,57), (0,13,27,42,58,41,59), (0,13,27,42,58,41,59), (0,19,39,61,84,11,36),(0,19,39,61,84,11,36),(0,26,53,81,52,82,51), (0, 26,53,81,52,82,51), (0, 44,92,29,64,4,43), (0,44,92,29,64,4,43), (0,65,1,33,66,10,52),(0,41,83,33,80,28, ∞) where $\infty = 97$
99	1	(0, 1,3,6,10,15,63), (0, 6,13,21,30,40,86), (0,11,23,37,52,96,42), (0,17,35,54,74,16,59),(0,21,43,66,90,29,68),(0,32,6,78,7,36,66), (0,74,9,44,81,34,50)

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