

List of full sensitivity spaced seeds for at most 5 mismatches

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Each spaced seed s is a periodic seed (b is a periodic block). It consists of n_b repetitions of the block and first n_d symbols of the blocks. Other parameters: w is the weight of the periodic seed, n_m is the maximum number of mismatches allowed to achieve the full sensitivity, L_{min} is the minimum length of a read required for the found seed.

We used the following selection criteria:

- by setting n_m and the length L of a read, we found all seeds of a maximum weight w ;
- for a given weight w we found the shortest length L_{min} of reads when we are able to find seeds;
- among all seeds found for n_m , w and L_{min} , we used only seeds of maximum length.

If a seed s is found, then its reverse version \bar{s} (all digits are in the reverse order) can also be used. To form the seeds below lists of seed blocks b were used. Those blocks were found for sizes from 10 to 50 for $n_m = 3, 4, \dots, 9$ and from 10 to 70 for $n_m = 2$. For each block size only sequences of maximum weight were used. There is a possibility that in a future longer seed blocks can be found and new spaced seeds can be formed for a given weight w (it will be possible to use them for shorter reads, i.e. L_{min} will be smaller).

- 1) $n_m = 5, w = 16, L_{min} = 62, n_b = 1, n_d = 11$,
 $b = 11100110101000000100100000$,
 $s = 1110011010100000010010000011100110101$
- 2) $n_m = 5, w = 17, L_{min} = 66, n_b = 1, n_d = 15$,
 $b = 10010110001110100000001000$,
 $s = 10010110001110100000001000100101100011101$
- 3) $n_m = 5, w = 18, L_{min} = 70, n_b = 1, n_d = 19$,
 $b = 10001001011000111010000000$,
 $s = 100010010110001110100000001000100101100011101$
- 4) $n_m = 5, w = 19, L_{min} = 74, n_b = 4, n_d = 5$,
 $b = 10101000001000$,
 $s = 1010100000100010101000001000101010000010001010100000100010101$
- 5) $n_m = 5, w = 20, L_{min} = 76, n_b = 1, n_d = 15$,
 $b = 110001101011111000000000000000$,
 $s = 11000110101111100000000000000000110001101011111$
- 6) $n_m = 5, w = 21, L_{min} = 79, n_b = 2, n_d = 11$,
 $b = 110010101110000000000000$,
 $s = 110010101110000000000000110010101110000000000011001010111$
- 7) $n_m = 5, w = 22, L_{min} = 82, n_b = 2, n_d = 5$,
 $b = 11101000000010001001011000$,
 $s = 111010000000100010010110001110100000001000100101100011101$
- 8) $n_m = 5, w = 23, L_{min} = 84, n_b = 2, n_d = 7$,
 $b = 11100110101000000100100000$,
 $s = 11100110101000000100100000111001101010000001001000001110011$
- 9) $n_m = 5, w = 24, L_{min} = 86, n_b = 2, n_d = 9$,
 $b = 11100110101000000100100000$,
 $s = 1110011010100000010010000011100110101000000100100000111001101$
- 10) $n_m = 5, w = 25, L_{min} = 88, n_b = 2, n_d = 11$,
 $b = 11100110101000000100100000$,
 $s = 111001101010000001001000001110011010100000010010000011100110101$
- 11) $n_m = 5, w = 26, L_{min} = 92, n_b = 2, n_d = 15$,
 $b = 10010110001110100000001000$,
 $s = 100101100011101000000010001001011000111010000001000100101100011101$

- 12) $n_m = 5, w = 27, L_{min} = 96, n_b = 2, n_d = 19,$
 $b = 10001001011000111010000000,$
 $s = 10001001011000111010000000100010010110001110100000001000100101100011101$
- 13) $n_m = 5, w = 28, L_{min} = 102, n_b = 3, n_d = 15,$
 $b = 1010001010101010000000,$
 $s = 101000101010101000000010100010101010100000001010001010101010000000101000101010101$
- 14) $n_m = 5, w = 29, L_{min} = 104, n_b = 3, n_d = 9,$
 $b = 101000111000001000011000,$
 $s = 101000111000001000011000101000111000001000011000101000111000001000011000101000111$
- 15) $n_m = 5, w = 29, L_{min} = 104, n_b = 3, n_d = 9,$
 $b = 111000101000011000001000,$
 $s = 111000101000011000001000111000101000011000001000111000101000011000001000111000101$
- 16) $n_m = 5, w = 29, L_{min} = 104, n_b = 3, n_d = 9,$
 $b = 101010101000001010001000,$
 $s = 101010101000001010001000101010101000001010001000101010101000001010001000101010101$
- 17) $n_m = 5, w = 30, L_{min} = 106, n_b = 3, n_d = 3,$
 $b = 11101000000010001001011000,$
 $s = 111010000000100010010110001110100000001000100101100011101000000010001001011000111$
- 18) $n_m = 5, w = 30, L_{min} = 106, n_b = 3, n_d = 3,$
 $b = 11100110101000000100100000,$
 $s = 111001101010000001001000001110011010100000010010000011100110101000000100100000111$
- 19) $n_m = 5, w = 31, L_{min} = 108, n_b = 3, n_d = 5,$
 $b = 11101000000010001001011000,$
 $s = 11101000000010001001011000111010000000100010010110001110100000001000100101100011101$
- 20) $n_m = 5, w = 32, L_{min} = 110, n_b = 3, n_d = 7,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011$
- 21) $n_m = 5, w = 33, L_{min} = 112, n_b = 3, n_d = 9,$
 $b = 11100110101000000100100000,$
 $s = 111001101010000001001000001110011010100000010010000011100110101000000100100000111001101$
- 22) $n_m = 5, w = 34, L_{min} = 114, n_b = 3, n_d = 11,$
 $b = 11100110101000000100100000,$
 $s = 11100110101000000100100000111001101010000001001000001110011010100000010010000011100110101$
- 23) $n_m = 5, w = 35, L_{min} = 118, n_b = 3, n_d = 15,$
 $b = 10010110001110100000001000,$
 $s = 100101100011101000000010001001011000111010000000100010010110001110100000001000100101100011101$
- 24) $n_m = 5, w = 36, L_{min} = 122, n_b = 3, n_d = 19,$
 $b = 10001001011000111010000000,$
 $s = 1000100101100011101000000010001001011000111010000000100010010110001110100000001000100101100011101$
- 25) $n_m = 5, w = 37, L_{min} = 128, n_b = 4, n_d = 9,$
 $b = 101000111000001000011000,$
 $s = 10100011100000100001100010100011100000100001100010100011100000100001100010100011100000100001100010000111$
- 26) $n_m = 5, w = 37, L_{min} = 128, n_b = 4, n_d = 9,$
 $b = 111000101000011000001000,$
 $s = 111000101000011000001000111000101000011000001000111000101000011000001000111000101000011000001000011000101$

- 27) $n_m = 5, w = 37, L_{min} = 128, n_b = 4, n_d = 9,$
 $b = 101010101000001010001000,$
 $s = 10101010100000101000100010101010100000101000100010101010100000101000100010101010000010100010$
 00101010101
- 28) $n_m = 5, w = 38, L_{min} = 131, n_b = 4, n_d = 2,$
 $b = 11000111010000000100010010,$
 $s = 1100011101000000010001001011000111010000000100010010110001110100000001000100101100011101000000$
 010001001011
- 29) $n_m = 5, w = 38, L_{min} = 131, n_b = 4, n_d = 2,$
 $b = 11101000000010001001011000,$
 $s = 1110100000001000100101100011101000000010001001011000111010000000100010010110001110100000001000$
 100101100011
- 30) $n_m = 5, w = 38, L_{min} = 131, n_b = 4, n_d = 2,$
 $b = 11010000000100010010110001,$
 $s = 1101000000010001001011000111010000000100010010110001110100000001000100101100011101000000010001$
 001011000111
- 31) $n_m = 5, w = 38, L_{min} = 131, n_b = 4, n_d = 2,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 010010000011
- 32) $n_m = 5, w = 38, L_{min} = 131, n_b = 4, n_d = 2,$
 $b = 11001101010000001001000001,$
 $s = 1100110101000000100100000111001101010000001001000001110011010100000010010000011100110101000000$
 100100000111
- 33) $n_m = 5, w = 38, L_{min} = 131, n_b = 4, n_d = 2,$
 $b = 11010100000010010000011100,$
 $s = 1101010000001001000001110011010100000010010000011100110101000000100100000111001101010000001001$
 000001110011
- 34) $n_m = 5, w = 39, L_{min} = 132, n_b = 4, n_d = 3,$
 $b = 11101000000010001001011000,$
 $s = 1110100000001000100101100011101000000010001001011000111010000000100010010110001110100000001000$
 1001011000111
- 35) $n_m = 5, w = 39, L_{min} = 132, n_b = 4, n_d = 3,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 0100100000111
- 36) $n_m = 5, w = 40, L_{min} = 134, n_b = 4, n_d = 5,$
 $b = 11101000000010001001011000,$
 $s = 1110100000001000100101100011101000000010001001011000111010000000100010010110001110100000001000$
 100101100011101
- 37) $n_m = 5, w = 41, L_{min} = 136, n_b = 4, n_d = 7,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 01001000001110011
- 38) $n_m = 5, w = 42, L_{min} = 138, n_b = 4, n_d = 9,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 0100100000111001101
- 39) $n_m = 5, w = 43, L_{min} = 140, n_b = 4, n_d = 11,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 010010000011100110101

- 40) $n_m = 5, w = 44, L_{min} = 144, n_b = 4, n_d = 15,$
 $b = 10010110001110100000001000,$
 $s = 10010110001110100000001000100101100011101000000100010010110001110100000010001001011000111010$
 $0000001000100101100011101$
- 41) $n_m = 5, w = 45, L_{min} = 148, n_b = 4, n_d = 19,$
 $b = 10001001011000111010000000,$
 $s = 1000100101100011101000000010001001011000111010000000100010010110001110100000001000100101100011$
 $10100000001000100101100011101$
- 42) $n_m = 5, w = 46, L_{min} = 153, n_b = 3, n_d = 10,$
 $b = 1101101101000100100100000010010010000,$
 $s = 11011011010001001001000000100100100001101101101000100100100000100100100001101101101000100100100$
 000100100100001101101101
- 43) $n_m = 5, w = 47, L_{min} = 156, n_b = 3, n_d = 13,$
 $b = 10100110110110000001001001000000100100,$
 $s = 10100110110110000001001001000000100100100110110110000001001001000000100100100110110110000001001$
 $0010000001001001010011011011$
- 44) $n_m = 5, w = 47, L_{min} = 156, n_b = 3, n_d = 13,$
 $b = 11001011011010000001001001000000100100,$
 $s = 110010110110100000010010010000001001001100101101101000000100100100000010010011001011011010000001001$
 $0010000001001001100101101101$
- 45) $n_m = 5, w = 47, L_{min} = 156, n_b = 3, n_d = 13,$
 $b = 10110100110110010000001001001000000100,$
 $s = 10110100110110010000001001001000000100101101001101100100000010010010000001001011010011011001000001$
 $0010010000001001011010011011$
- 46) $n_m = 5, w = 48, L_{min} = 158, n_b = 5, n_d = 3,$
 $b = 111010000000010001001011000,$
 $s = 11101000000001000100101100011101000000001000100101100011101000000001000100101100011101000000001000$
 $1001011000111010000000010001001011000111$
- 47) $n_m = 5, w = 48, L_{min} = 158, n_b = 5, n_d = 3,$
 $b = 111001101010000000100100000,$
 $s = 1110011010100000001001000000110011010100000001001000000110011010100000001001000000110011010100000$
 $01001000000110011010100000001001000000111$
- 48) $n_m = 5, w = 49, L_{min} = 160, n_b = 5, n_d = 5,$
 $b = 111010000000010001001011000,$
 $s = 11101000000001000100101100011101000000001000100101100011101000000001000100101100011101000000001000$
 $100101100011101000000001000100101100011101$
- 49) $n_m = 5, w = 50, L_{min} = 162, n_b = 5, n_d = 7,$
 $b = 111001101010000000100100000,$
 $s = 1110011010100000001001000000110011010100000001001000000110011010100000001001000000110011010100000$
 $010010000001100110101000000010010000001110011$
- 50) $n_m = 5, w = 51, L_{min} = 164, n_b = 5, n_d = 9,$
 $b = 111001101010000000100100000,$
 $s = 1110011010100000001001000000110011010100000001001000000110011010100000001001000000110011010100000$
 $01001000000110011010100000001001000000111001101$
- 51) $n_m = 5, w = 52, L_{min} = 166, n_b = 5, n_d = 11,$
 $b = 111001101010000000100100000,$
 $s = 1110011010100000001001000000110011010100000001001000000110011010100000001001000000110011010100000$
 $010010000001100110101000000010010000001100110101$
- 52) $n_m = 5, w = 53, L_{min} = 170, n_b = 5, n_d = 15,$
 $b = 100101100011101000000001000,$
 $s = 100101100011101000000001000100101100011101000000001000100101100011101000000010001001011000111010$
 $00000001000100101100011101000000001000100101100011101$

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- 66) $n_m = 5, w = 61, L_{min} = 192, n_b = 6, n_d = 11,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 $0100100000111001101010000001001000001110011010100000010010000011100110101$
- 67) $n_m = 5, w = 62, L_{min} = 196, n_b = 6, n_d = 15,$
 $b = 10010110001110100000001000,$
 $s = 1001011000111010000000100010010110001110100000001000100101100011101000000010001001011000111010$
 $00000010001001011000111010000000100010010110001110100000001000100101100011101$
- 68) $n_m = 5, w = 63, L_{min} = 200, n_b = 6, n_d = 19,$
 $b = 10001001011000111010000000,$
 $s = 1000100101100011101000000010001001011000111010000000100010010110001110100000001000100101100011$
 $101000000010001001011000111010000000100010010110001110100000001000100101100011101$
- 69) $n_m = 5, w = 64, L_{min} = 204, n_b = 4, n_d = 15,$
 $b = 10101010101010101000000010101000101000,$
 $s = 10101010101010101000000010101000101000101010101010101010101000000010101000101000101010101010$
 $0000001010100010100010101010101010101000000010101000101000101010101010101$
- 70) $n_m = 5, w = 64, L_{min} = 204, n_b = 4, n_d = 15,$
 $b = 101010101010101000000001010100010100010,$
 $s = 101010101010101000000001010100010100010101010101010101010100000001010100010100010101010101000$
 $0000101010001010001010101010101010101000000010101000101000101010101010101$
- 71) $n_m = 5, w = 64, L_{min} = 204, n_b = 4, n_d = 15,$
 $b = 101010101010101010000001010001010001000,$
 $s = 10101010101010101000000101000101000100010101010101010101010000001010001010001000101010101010$
 $000010100010100010001010101010101010100000010100010100010001010101010101$
- 72) $n_m = 5, w = 64, L_{min} = 204, n_b = 4, n_d = 15,$
 $b = 101010101010101000000101000101000100010,$
 $s = 10101010101010100000010100010100010001010101010101010101010000001010001010001000101010101000$
 $001010001010001000101010101010101010100000010100010100010001010101010101$
- 73) $n_m = 5, w = 64, L_{min} = 204, n_b = 4, n_d = 15,$
 $b = 101010101010101000010001010100000101000,$
 $s = 1010101010101010000100010101000000100010101010101010100010001010100000010100000010000101010101000$
 $1000101010000001010001010101010101010001000101010000001010001010101010101$
- 74) $n_m = 5, w = 65, L_{min} = 206, n_b = 4, n_d = 17,$
 $b = 10101010101010101000000010101000101000,$
 $s = 10101010101010101000000010101000101000101010101010101010101000000010101000101000101010101010$
 $0000001010100010100010101010101010101000000010101000101000101010101010101$
- 75) $n_m = 5, w = 65, L_{min} = 206, n_b = 4, n_d = 17,$
 $b = 101010101010101010000001010001010001000,$
 $s = 10101010101010101000000101000101000100010101010101010101010000001010001010001000101010101010$
 $000010100010100010001010101010101010100000010100010100010001010101010101$
- 76) $n_m = 5, w = 66, L_{min} = 210, n_b = 7, n_d = 3,$
 $b = 111010000000010001001011000,$
 $s = 11101000000001000100101100011101000000010001001011000111010000000100010010110001110100000001000$
 $1001011000111010000000100010010110001110100000001000100101100011101000000010001001011000111$
- 77) $n_m = 5, w = 66, L_{min} = 210, n_b = 7, n_d = 3,$
 $b = 11100110101000000100100000,$
 $s = 1110011010100000010010000011100110101000000100100000111001101010000001001000001110011010100000$
 $0100100000111001101010000001001000001110011010100000010010000011100110101000000100100000111$
- 78) $n_m = 5, w = 67, L_{min} = 212, n_b = 7, n_d = 5,$
 $b = 111010000000010001001011000,$
 $s = 11101000000001000100101100011101000000010001001011000111010000000100010010110001110100000001000$
 $100101100011101000000010001001011000111010000000100010010110001110100000001000100101100011101$

- 91) $n_m = 5, w = 76, L_{min} = 235, n_b = 4, n_d = 11,$
 $b = 110110110110000010010010010100010010010000,$
 $s = 11011011011000001001001001010001001001000011011011011000001001001001000100100100100001101$
 $1011011000001001001001010001001001000011011011011000001001001001010001001001000011011011011$
- 92) $n_m = 5, w = 76, L_{min} = 235, n_b = 4, n_d = 11,$
 $b = 110110110110100010010010010000010010010010000,$
 $s = 1101101101101000100100100100000100100100100001101101101101000100100100100000100100100100001101$
 $1011011010001001001001000001001001001000011011011011010001001001001001000001001001001000011011011011$
- 93) $n_m = 5, w = 77, L_{min} = 237, n_b = 4, n_d = 13,$
 $b = 110110110110100010010010010000010010010010000,$
 $s = 1101101101101000100100100100000100100100100001101101101101000100100100100000100100100100001101$
 $10110110100010010010010000010010010010000110110110110100010010010010010000010010010010000110110110110$
 1
- 94) $n_m = 5, w = 78, L_{min} = 240, n_b = 4, n_d = 31,$
 $b = 10101010101010101010001000101010100000101000,$
 $s = 101010101010101010100010001010101000001010001010101010101010101010101000100010101010000010100010101010$
 $1010101000100010101010000010100010101010101010101010101010001000101010100000101000101010101010101010001000$
 1010101
- 95) $n_m = 5, w = 79, L_{min} = 243, n_b = 4, n_d = 19,$
 $b = 100101001101101101100000100100100100000100100,$
 $s = 1001010011011011011000001001001001000001001001001010011011011011000001001001001000001001001001$
 $0100110110110110000010010010010000010010010010011011011011000001001001001000001001001001001101$
 1011011
- 96) $n_m = 5, w = 79, L_{min} = 243, n_b = 4, n_d = 19,$
 $b = 100110010110110110100000100100100100000100100,$
 $s = 1001100101101101101000001001001001000001001001001100101101101101000001001001001000001001001001$
 $10010110110110100000100100100100000100100100110010110110110100000100100100100000100100100110010110$
 1101101
- 97) $n_m = 5, w = 79, L_{min} = 243, n_b = 4, n_d = 19,$
 $b = 100101101001101101100100000100100100100000100,$
 $s = 1001011010011011011001000001001001001000001001001011010011011011001000001001001001000001001001$
 $01101001101101100100000100100100100000100100101101001101101100100000100100100100000100100101101001$
 1011011
- 98) $n_m = 5, w = 79, L_{min} = 243, n_b = 4, n_d = 19,$
 $b = 101101001101101100100000100100100100000100100,$
 $s = 1011010011011011001000001001001001000001001001011010011011011001000001001001001000001001001011$
 $01001101101100100000100100100100000100100101101001101101100100000100100100100000100100101101001101$
 1011001
- 99) $n_m = 5, w = 79, L_{min} = 243, n_b = 4, n_d = 19,$
 $b = 100110110010110110100100000100100100100000100,$
 $s = 1001101100101101101001000001001001001000001001001101100101101101001000001001001001000001001001$
 $10110010110110100100000100100100100000100100110110010110110100100000100100100100000100100110110010$
 1101101
- 100) $n_m = 5, w = 79, L_{min} = 243, n_b = 4, n_d = 19,$
 $b = 110110010110110100100000100100100100000100100,$
 $s = 1101100101101101001000001001001001000001001001101100101101101001000001001001001000001001001101$
 $10010110110100100000100100100100000100100110110010110110100100000100100100100000100100110110010110$
 1101001
- 101) $n_m = 5, w = 80, L_{min} = 246, n_b = 4, n_d = 37,$
 $b = 101000101010101010101010001000101010100000,$
 $s = 10100010101010101010101000100010101010000010100010101010101010101010100010001010101000001010001010$
 $101010101010100010001010101000001010001010101010101010100010001010101000001010001010101010101010$
 0010001010101

- 102) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 100100100101001101101101100000100100100100000,$
 $s = 10010010010100110110110110000010010010010000010010010010011011011011000001001001001000001001$
 $00100101001101101101100000100100100100000100100100101001101101101100000100100100100000100100101$
 0011011011011
- 103) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 101100100101001100101101100000100100100100000,$
 $s = 1011001001010011001011011000001001001001000001011001001010011001011011000001001001001000001011$
 $00100101001100101101100000100100100100000101100100101001100101101100000100100100100000101100100101$
 0011001011011
- 104) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 100101100101001101100101100000100100100100000,$
 $s = 1001011001010011011001011000001001001001000001001011001010011011001011000001001001001000001001$
 $01100101001101100101100000100100100100000100101100101001101100101100000100100100100000100101100101$
 0011011001011
- 105) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 101101100101001100100101100000100100100100000,$
 $s = 1011011001010011001001011000001001001001000001011011001010011001001011000001001001001000001011$
 $01100101001100100101100000100100100100000101101100101001100100101100000100100100100000101101100101$
 0011001001011
- 106) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 100100100110010110110110100000100100100100000,$
 $s = 1001001001100101101101101000001001001001000001001001001100101101101101000001001001001000001001$
 $00100110010110110110100000100100100100000100100100110010110110110100000100100100100000100100100110$
 0101101101101
- 107) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 100110100110010110100110100000100100100100000,$
 $s = 1001101001100101101001101000001001001001000001001101001100101101001101000001001001001000001001$
 $10100110010110100110100000100100100100000100110100110010110100110100000100100100100000100110100110$
 0101101001101
- 108) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 100100101101001101101100100000100100100100000,$
 $s = 1001001011010011011011001000001001001001000001001001011010011011011001000001001001001000001001$
 $00101101001101101100100000100100100100000100100101101001101101100100000100100100100000100100101101$
 0011011011001
- 109) $n_m = 5, w = 81, L_{min} = 249, n_b = 4, n_d = 25,$
 $b = 100100110110010110110100100000100100100100000,$
 $s = 1001001101100101101101001000001001001001000001001001101100101101101001000001001001001000001001$
 $00110110010110110100100000100100100100000100100110110010110110100100000100100100100000100100110110$
 0101101101001
- 110) $n_m = 5, w = 82, L_{min} = 252, n_b = 5, n_d = 25,$
 $b = 10101010101010001010101010000010001000,$
 $s = 1010101010101000101010101000001000100010101010101000101010100000100010001010101010100010$
 $101010100000100010001010101010100010101010000010001000101010101010001010101000001000100010$
 101010101000101010101
- 111) $n_m = 5, w = 83, L_{min} = 256, n_b = 5, n_d = 29,$
 $b = 101010001010001010101010101010000000,$
 $s = 101010001010001010101010101010000000101010001010001010101010101010000000101010001010001010$
 $101010101010000000101010001010001010101010101000000010101000101000101010101010101000000010$
 $1010001010001010101010101$
- 112) $n_m = 5, w = 83, L_{min} = 256, n_b = 5, n_d = 29,$
 $b = 101000101000101010101010101000000010,$
 $s = 1010001010001010101010101000000010101000101000101010101010101000000010101000101000101010$

[illegible]

- [illegible]

- 144) $n_m = 5, w = 95, L_{min} = 285, n_b = 5, n_d = 16,$
 $b = 101001101101101100000100100100100000100100100,$
 $s = 1010011011011011000001001001001000001001001001010011011011011000001001001001000001001001001010$
 $01101101101100000100100100100000100100100101001101101101100000100100100100000100100100101001101101$
 $1011000001001001001000001001001001010011011011011$
- 145) $n_m = 5, w = 95, L_{min} = 285, n_b = 5, n_d = 16,$
 $b = 110010110110110100000100100100100000100100100,$
 $s = 1100101101101101000001001001001000001001001001100101101101101101000001001001001000001001001001100$
 $10110110110100000100100100100000100100100110010110110110110100000100100100100000100100110010110110$
 $1101000001001001001000001001001001100101101101101$
- 146) $n_m = 5, w = 95, L_{min} = 285, n_b = 5, n_d = 16,$
 $b = 101101001101101100100000100100100100000100100,$
 $s = 1011010011011011001000001001001001000001001001011010011011011001000001001001001000001001001011$
 $01001101101100100000100100100100000100100101101001101101100100000100100100100000100100101101001101$
 $1011001000001001001001000001001001011010011011011$
- 147) $n_m = 5, w = 95, L_{min} = 285, n_b = 5, n_d = 16,$
 $b = 110110010110110100100000100100100100000100100,$
 $s = 1101100101101101001000001001001001000001001001101100101101101001000001001001001000001001001101$
 $10010110110100100000100100100100000100100110110010110110100100000100100100100000100100110110010110$
 $1101001000001001001001000001001001101100101101101$
- 148) $n_m = 5, w = 96, L_{min} = 288, n_b = 5, n_d = 37,$
 $b = 101000101010101010101010001000101010100000,$
 $s = 10100010101010101010101000100010101010000010100010101010101010100010001010101000001010001010$
 $10101010101010001000101010100000101000101010101010101000100010101010100010001010101010101010$
 $00100010101010000010100010101010101010101000100010101010100010001010101$
- 149) $n_m = 5, w = 97, L_{min} = 291, n_b = 5, n_d = 22,$
 $b = 100100101001101101101100000100100100100000100,$
 $s = 10010010100110110110110000010010010010000010010010010011011011011000001001001001000001001001$
 $00101001101101101100000100100100100000100100100101001101101101100000100100100100000100100100101001$
 $1011011011000001001001001000001001001001010011011011011$
- 150) $n_m = 5, w = 97, L_{min} = 291, n_b = 5, n_d = 22,$
 $b = 101100101001101100101100000100100100100000100,$
 $s = 1011001010011011001011000001001001001000001001011001010011011001011000001001001001000001001011$
 $00101001101100101100000100100100100000100101100101001101100101100000100100100100000100101100101001$
 $1011001011000001001001001000001001011001010011011001011$
- 151) $n_m = 5, w = 97, L_{min} = 291, n_b = 5, n_d = 22,$
 $b = 100100110010110110110100000100100100100000100,$
 $s = 1001001100101101101101000001001001001000001001001001100101101101101000001001001001000001001001$
 $00110010110110110100000100100100100000100100100110010110110110100000100100100100000100100110010$
 $1101101101000001001001001000001001001001100101101101101$
- 152) $n_m = 5, w = 97, L_{min} = 291, n_b = 5, n_d = 22,$
 $b = 110100110010110100110100000100100100100000100,$
 $s = 1101001100101101001101000001001001001000001001101001100101101001101000001001001001000001001101$
 $00110010110100110100000100100100100000100110100110010110100110100000100100100100000100110100110010$
 $1101001101000001001001001000001001101001100101101001101$
- 153) $n_m = 5, w = 97, L_{min} = 291, n_b = 5, n_d = 22,$
 $b = 100100101101001101101100100000100100100100000,$
 $s = 1001001011010011011011001000001001001001000001001001011010011011011001000001001001001000001001$
 $00101101001101101100100000100100100100000100100101101001101101100100000100100100000100100101101$
 $001101101100100000100100100100000100100101101001101101$
- 154) $n_m = 5, w = 97, L_{min} = 291, n_b = 5, n_d = 22,$
 $b = 100101101001101101100100000100100100100000100,$
 $s = 1001011010011011011001000001001001001000001001001011010011011011001000001001001001000001001001$

- [illegible]

[illegible]

- [illegible]

- [illegible]

- [illegible]

- [illegible]

- 24

- 25

- [illegible]

- 29

307) $n_m = 5$, $w = 137$, $L_{min} = 394$, $n_b = 8$, $n_d = 17$.

$$b = 101010101010101010001000101010100000101000,$$

$s =$ 101010101010101010001000101010100000101000101010101010101010001000101010100000101000101010101
101010100010001010101000001010001010101010101010100010001010101000001010001010101010101010001000
1010101000001010001010101010101010001000101010100000101000101010101010101000100010101010000010
100010101010101010101000100010101010000010100010101010101010101

308) $n_m = 5$, $w = 138$, $L_{min} = 398$, $n_b = 8$, $n_d = 21$,

$$b = 1010001010101010101010001000101010100000,$$

$s =$ 1010001010101010101010101000100010101010000010100010101010101010100010001010101000001010001010
1010101010101000100010101010000010100010101010101010100010001010101000001010001010101010101010
00100010101010000010100010101010101010100010001010101000001010001010101010101000100010101010
000010100010101010101010100010001010101000001010001010101010101

309) $n_m = 5$, $w = 138$, $L_{min} = 398$, $n_b = 8$, $n_d = 21$.

$$b = 100010101010101010101000100010101010000010,$$

$s =$ 100010101010101010101010001000101010100000101000101010101010101010001000101010100000101000101010
1010101010100010001010101000001010001010101010101010001000101010100000101000101010101010101000
10001010101000001010001010101010101010001000101010100000101000101010101010100010001010101000
001010001010101010101010100010001010101000001010001010101010101

310) $n_m = 5$, $w = 138$, $L_{min} = 398$, $n_b = 8$, $n_d = 21$,

$$b = 1010101010101010001000101010100000101000,$$

$s =$ 101010101010101010001000101010100000101000101010101010101010001000101010100000101000101010101
101010100010001010101000001010001010101010101010100010001010101000001010001010101010101010001000
101010100000101000101010101010101000100010101010000010100010101010101010101000100010101010000010
1000101010101010101010001000101010100000101000101010101010101010001

311) $n_m = 5$, $w = 139$, $L_{min} = 400$, $n_b = 8$, $n_d = 23$,

$$b = 1010001010101010101010001000101010100000,$$

```
s = 1010001010101010101010100010001010101000001010001010101010101010100010001010101000001010001010  
101010101010100010001010101000001010001010101010101010001000101010100000101000101010101010101010  
00100010101010000010100010101010101010101000100010101010000010100010101010101010101000100010101010  
000010100010101010101010100010001010101000001010001010101010101
```