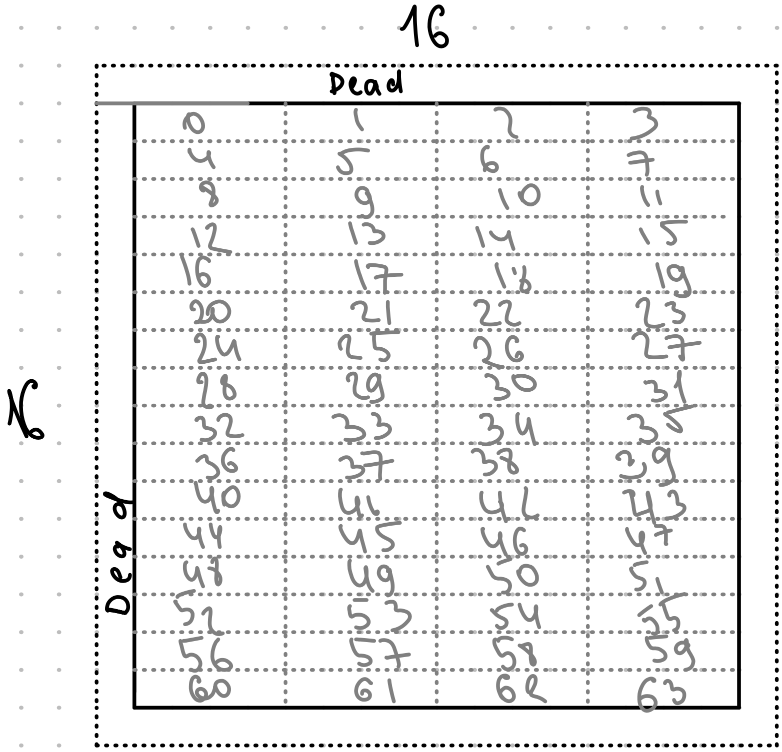
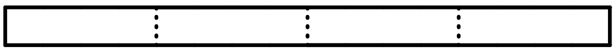
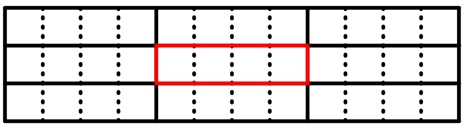


поле – 64×int16 + 4+4 (верх, низ)

int: (16)



4 клетки в 16 бит



N = M[(i-1)%4]

S = M[(i+1)%4]

W = M[i]>>4 | (0b1111 0000 0000 0000 & M[i-

E = M[i]<<4 | (0b0000 0000 0000 1111 & M[i+1]

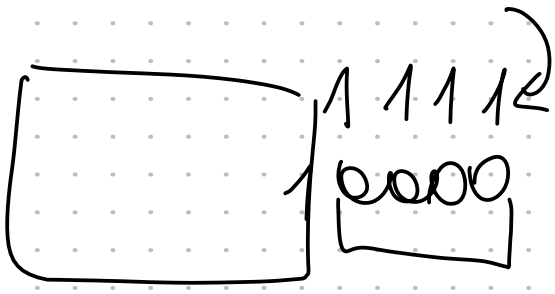
f(ceil:1 , count:3)

	a	b	c	d	count
dead	0	0	0	0	
	0	0	0	1	
	0	0	1	0	
	0	0	1	1	1
	0	1	0	0	
	0	1	0	1	
	0	1	1	0	
	0	1	1	1	
	1	0	0	0	
	1	0	0	1	
	1	0	1	0	1
	1	0	1	1	1
	1	1	0	0	
	1	1	0	1	
	1	1	1	0	
	1	1	1	1	

Dead and $011_2 = 3_{10}$ neighbours

Alive and $010_2 = 2_{10}$ neighbours
$011_2 = 3_{10}$ neighbours

$$f(a,b,c,d) = (\bar{a} \& \bar{b} \overset{①}{\&} c \& d) \vee (a \& b \overset{②}{\&} c \& \bar{d}) \vee (a \& \bar{b} \overset{③}{\&} c \& d)$$



минимизация

① и ③ $\bar{b}cd(\bar{a} \vee a) = \bar{b}cd$ ④

② и ④ $\bar{b}cd \vee abc\bar{d} = \bar{b}c(d \vee ad) \overset{(*)}{=} \bar{b}c(d \vee a)$

$$f(a,b,c,d) = \bar{b}c(d \vee a)$$

$A + \bar{A}B = A + B$ (*)

A	B	$A + \bar{A}B$	$A + B$
0	0	0	0
0	1	1	1
1	0	1	1
1	1	1	1

$N = \overline{abcd}_2 = (!(N \& 0b0100) \& N \& 0b0010 \&$

$(N \& 0b0001 \mid N \& 0b1000)$

```
int countNeighbours_4(int word) {
    return (((word & 0b0100010001000100) ^ 0b0100010001000100) >> 2) &
    ((word & 0b0010001000100010) >> 1) &
    ((word & 0b0001000100010001) | (word & 0b1000100010001000) >> 3);
}
```

)<<3

корректный формат

```
void next_gen(unsigned short field[], unsigned short write[]) {
    for (unsigned short i = 1; i <= SIZE; i++) { // row
        for (unsigned short j = 1; j <= 4; j++) { // one of 4 ceil
            unsigned short c = field[i * 6 + j];
            unsigned short N = field[(i - 1) * 6 + j];
            unsigned short S = field[(i + 1) * 6 + j];
            unsigned short W = ((field[i * 6 + (j - 1)] & 0b0000000000001111) << 12 | (c >> 4));
            unsigned short E = ((field[i * 6 + (j + 1)] & 0b1111000000000000) >> 12 | (c << 4));
            unsigned short NW = ((field[(i - 1) * 6 + (j - 1)] & 0b0000000000001111) << 12 | (N >> 4));
            unsigned short NE = ((field[(i - 1) * 6 + (j + 1)] & 0b1111000000000000) >> 12 | (N << 4));
            unsigned short SW = ((field[(i + 1) * 6 + (j - 1)] & 0b0000000000001111) << 12 | (S >> 4));
            unsigned short SE = ((field[(i + 1) * 6 + (j + 1)] & 0b1111000000000000) >> 12 | (S << 4));
            unsigned short neighbours = (N >> 3) + (S >> 3) + (E >> 3) + (W>>3) + (NW>>3) + (NE>>3) + (SW>>3) + (SE>>3);
            unsigned short word = neighbours | c;
            unsigned short new = countNeighbours_4(word);
            write[i * 6 + j] = new;
        }
    }
}
```

убрать умножение на 6

$i = 1 \dots 16$ $\quad i \cdot 6$ $\quad (i-1) \cdot 6 = 6i - 6$ $\quad (i+1)6 = 6i + 6$

$k = 6, 12, \dots, 96$ $\quad k$ $\quad k - 6$ $\quad k + 6$