θ2-G1

向量

位图：数据结构

这样做能保存的信息量就小多了，不到原来的
万分之一，但他们也只能接受这个结果

邓俊辉

deng@tsinghua.edu.cn
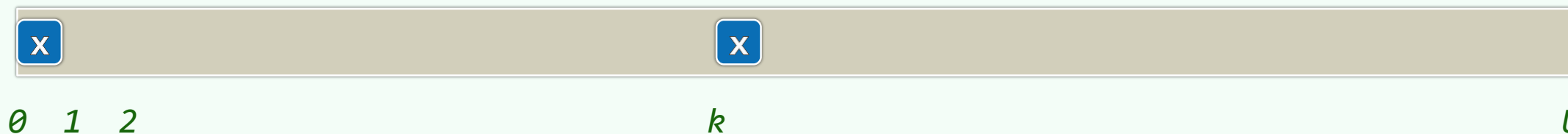
$$\forall \, 0 \leq k < U \, :$$

$$k \in S \, ?$$ **bool <u>test</u>(int k);**

$$S \cup \{k\}$$ **void <u>set</u>(int k);**

$$S \backslash \{k\}$$ **void <u>clear</u>(int k);**

`0  1  2`   `k`   `U`

结构

```
class Bitmap {

private:

    unsigned char * M;

    Rank N, _sz;

public:

    Bitmap( Rank n = 8 )

        { M = new unsigned char[ N = (n+7)/8 ]; memset( M, 0, N ); _sz = 0; }

    ~Bitmap() { delete [] M; M = NULL; _sz = 0; }

    void set( int k ); void clear( int k ); bool test( int k );

};
```
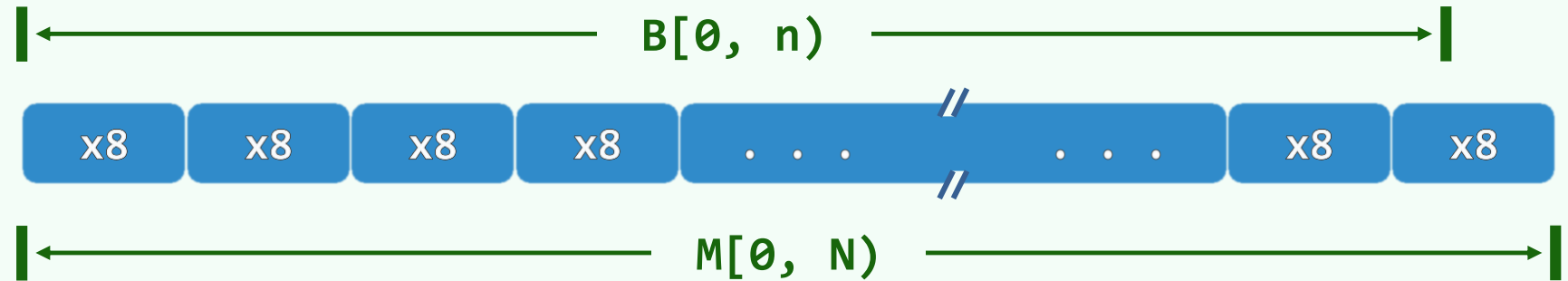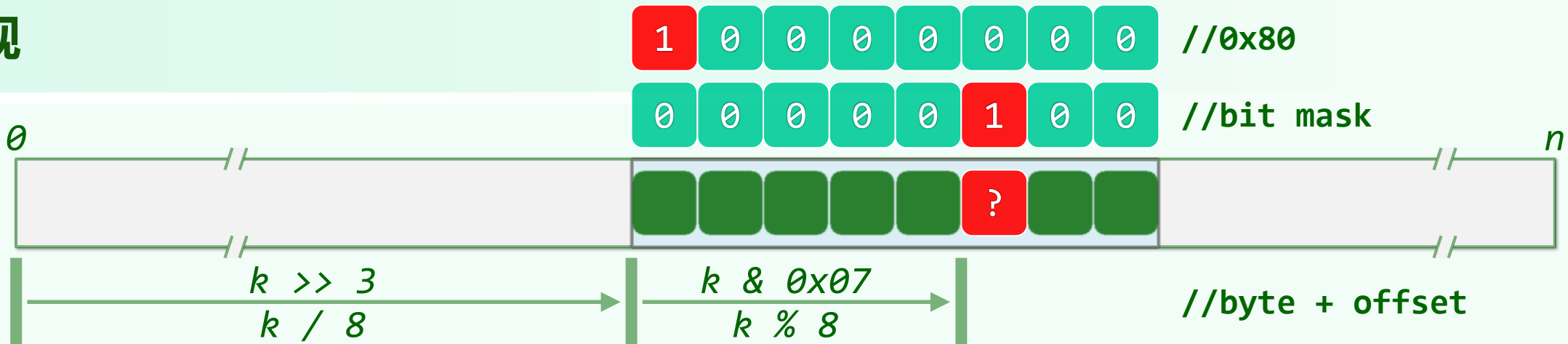
B[0, n)

x8 x8 x8 x8 ...   ... x8 x8

M[0, N)

实现


```
bool test (Rank k) { expand(k); return M[ k >> 3 ] &  ( 0x80 >> (k & 0x07) ); }

void set  (Rank k) { if (  test(k) ) return;

                     expand(k); _sz++; M[ k >> 3 ] |=  ( 0x80 >> (k & 0x07) ); }

void clear(Rank k) { if ( !test(k) ) return;

                     expand(k); _sz--; M[ k >> 3 ] &= ~( 0x80 >> (k & 0x07) ); }
```