2.向量

归并排序

二路归并

天下大势，分久必合，合久必分

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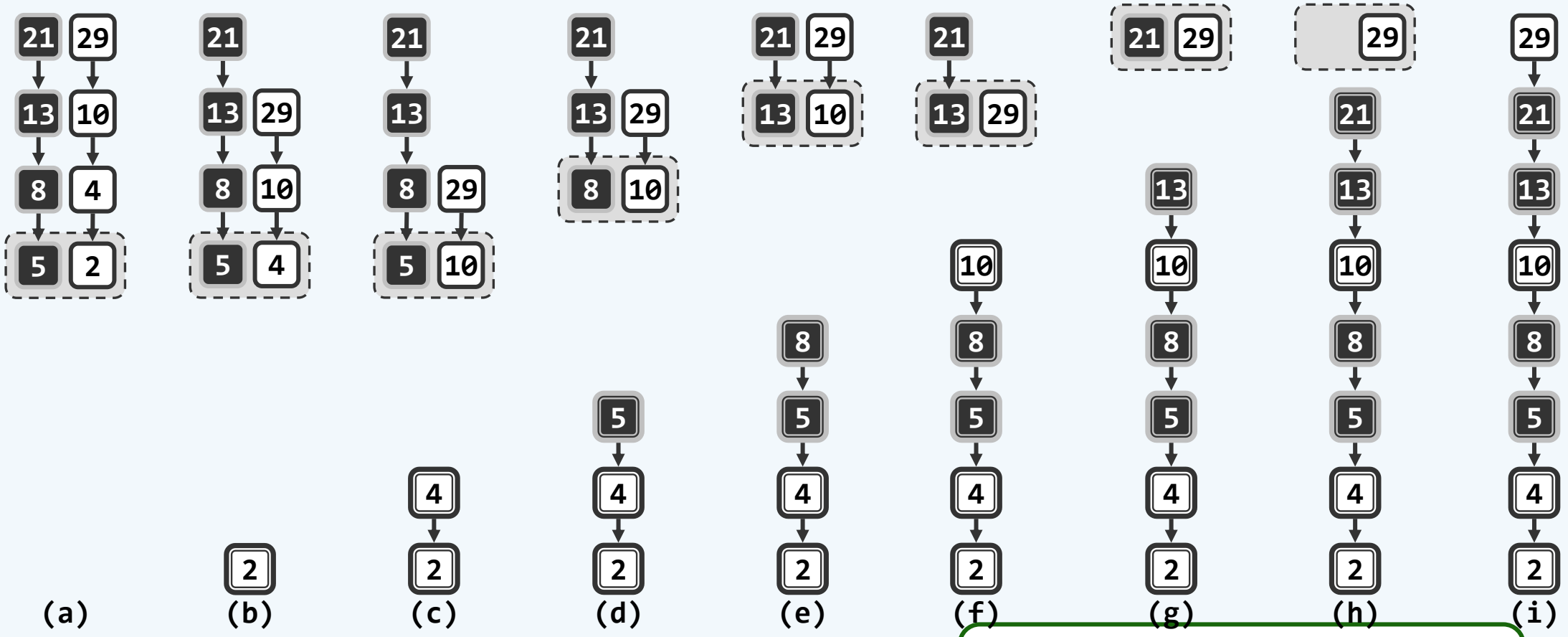
二路归并

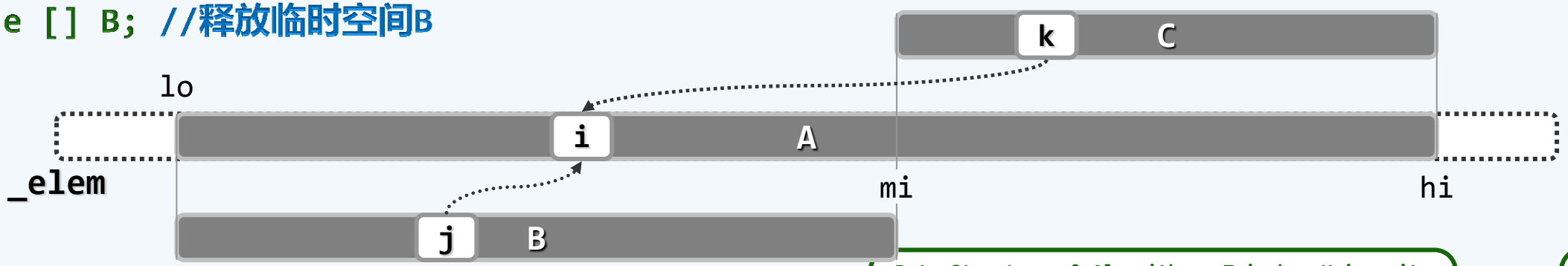
❖ 2-way merge： 两个有序序列，合并为一个有序序列：

S[lo, hi) = S[lo, mi) + S[mi, hi)

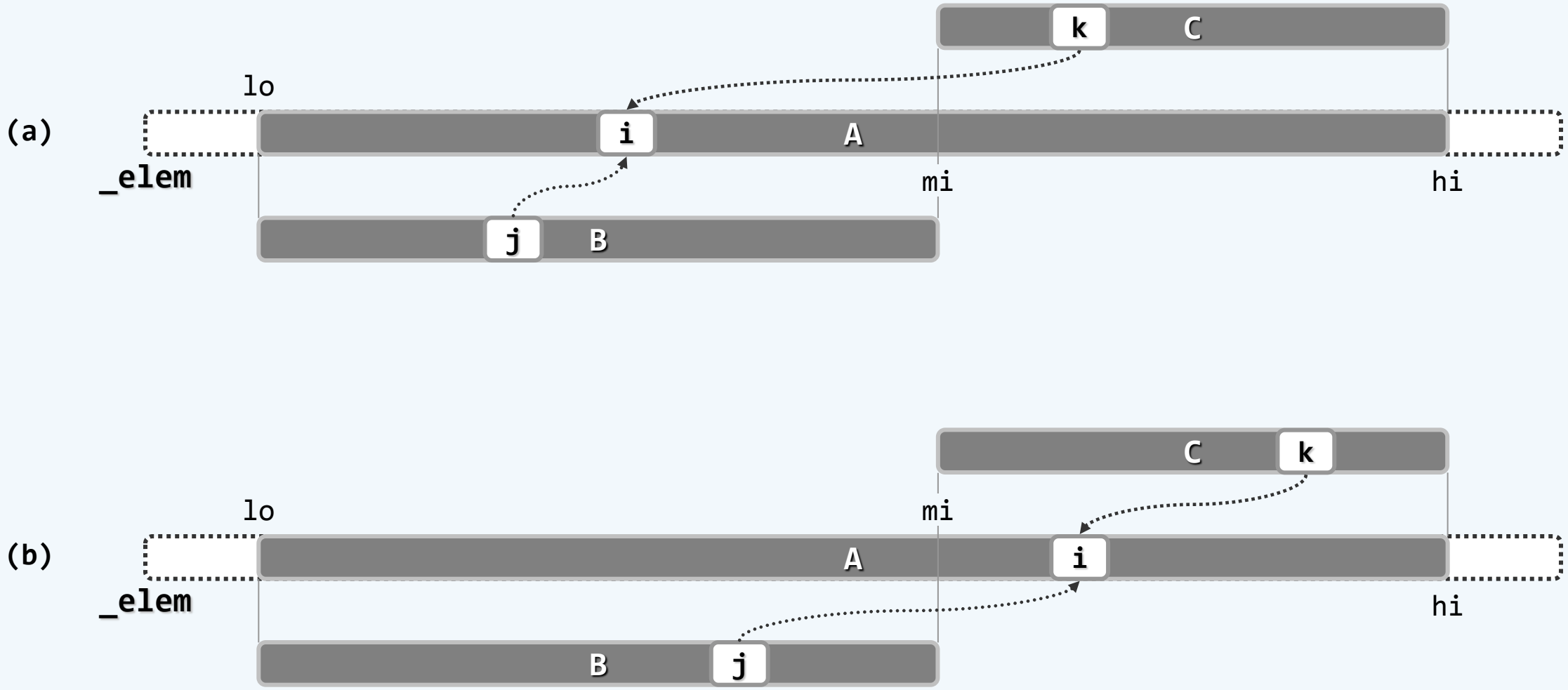


基本实现

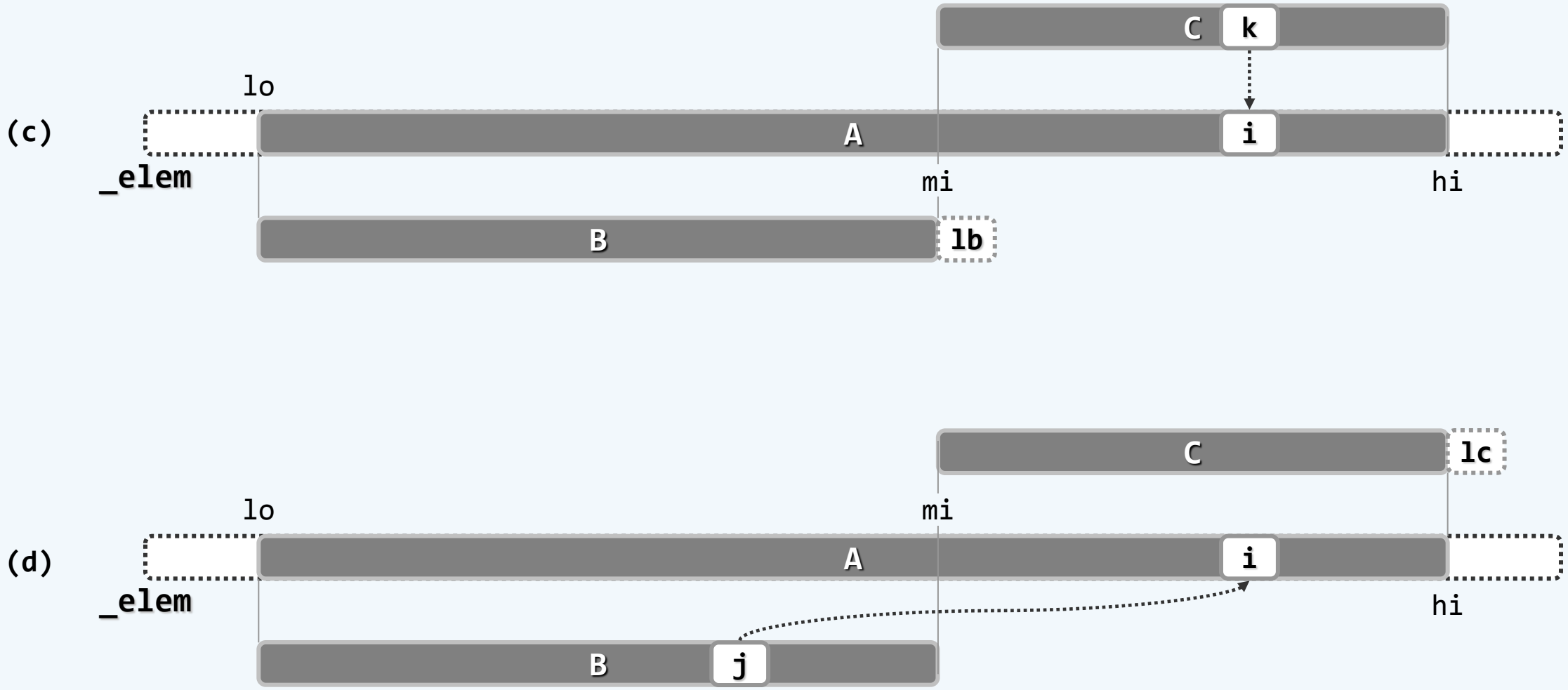
```
template <typename T> void Vector<T>::merge( Rank lo, Rank mi, Rank hi ) {
   T* A = _elem + lo; int lb = mi - lo; T* B = new T[lb]; //A[0, hi - lo) = _elem[lo, hi)
   for ( Rank i = 0; i < lb; B[i] = A[i++] ); //复制前子向量B[0, lb) = _elem[lo, mi)
   int lc = hi - mi; T* C = _elem + mi; //后子向量C[0, lc) = _elem[mi, hi)
   for ( Rank i = 0, j = 0, k = 0; j < lb || k < lc; ) { //B[j]和C[k]中小者转至A的末尾
      if ( j < lb && ( lc <= k || B[j] <= C[k] ) ) A[i++] = B[j++]; //C[k]已无或不小
      if ( k < lc && ( lb <= j || C[k] <  B[j] ) ) A[i++] = C[k++]; //B[j]已无或更大
   } //该循环实现紧凑；但就效率而言，不如拆分处理
  delete [] B; //释放临时空间B
}
```



正确性



正确性



精简实现

```
❖   for ( Rank i = 0, j = 0, k = 0; (j < lb) || (k < lc); ) {

      if ( k < lc && ( lb <= j || C[k] <  B[j] ) ) A[i++] = C[k++];

      if ( j < lb && ( lc <= k || B[j] <= C[k] ) ) A[i++] = B[j++];

    } //交换循环体内两句的次序，删除冗余逻辑
```