Arrays

2.2 A A D

A :

■ **A : < , > ( )**

■ **: ,**

C++ AD .

G A

G A

// < , >

// I . I

// .

:

G A (, , =

);

/ / / /

( );

// (∈I)

// ; .

(,);

// (∈I)

// ;

; // G A .

:

-
-
- A C++
- , C++

A

. **:**

E **:**

(, , , , , F ,)

(2, 3, 4, 5, 6, 7, 8, 9, 10, , , , A)

( ) //

, A

(0, 1,…, -1) . //

:

(1) F , , .

(2)

(5) **, 0≤ < ,**

, +1, -1

+1, +2, .

(6) D **, 0≤ < ,**

+1, +2, -1

, +1, -2.

?

-
  - : ←→
- C
  -
    - (1).
    - (5) (6)?
    - D
    - ( )

.

:

B AD

.

A( )=3 ^{2}+ 2 +4

B( )= ^{4}+ 10 ^{3}+ 3 ^{2}+1

D :

AD

// ( )= $_0$ ^{0}+, ,+ ; < , >,
//
// -
:
( );
// C ( )=0

```
        A           (E          , C          );
    //                  < , >    *     ,

                    A    (                   );
    //                                    *

                         (                   );
    //                                         *

        E    (          );
    //                  *
}
```

$$A(\ ) = \quad + \quad_{-1} \quad^{-1} +, \quad ,+ \quad_{1} + \quad_{0}$$

1

:

; // **≤** D

D +1 **;**

. = ?

; D **?**

. = ?

-, 0 ≤ ≤

.

2

. << D , 1

. ,

:

:

;

*** ;**

:: ( )

= ;

= +1 ;

2 .

F , $^{1000}+1$

999 .

, :

3

$A(\ ) = \quad + \quad_{-1} \quad ^{-1}+, \quad ,+ \quad_{0} \quad ^{0}$

$\neq 0, \quad > \quad_{-1}>, \quad , \quad_{0} \geq 0$

; //

;

:

; //

; //

:

:

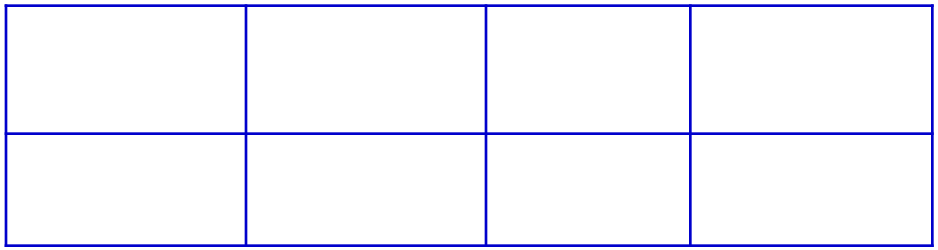
* A ;

; // A

; //

F A( ) = $2^{1000} + 1$

A. A :



F --- ?

2.

A

3 C = A +B.

:

B

,

A( ) B( ) C( ).

C A

.

A ,

.

```
1                                ::A    (                )
2    //                                  *                .
3                    ;
4              =0,          =0;
5           ((          <          ) && (   <   .          ))
6        (       A                .     ==  .       A                .     )
7                          =       A                .     +       A                .
8        (   )
9           .                ( ,       A                .     );
10             ++;          ++;
11
12             (       A                .     <   .       A                .     )
13          .                ( .       A                .     ,
                                 .       A                .     );
14             ++;
15
```

```
15
16      .          (     A          .     ,     A          .     );
17          ++;
18
19  //                                  *
20      ( ;      <      ;      ++ )
21      .          (     A          .     ,     A          .     );
22  //
23      ( ;      <  .      ;      ++ )
24      .          ( .     A          .     , .     A          .     );
25          ;
26
```

:: (C ,
E)
// A .
(==)
// A
*= 2;
* = ; //
(A , A + ,);
A ; //
A = ;

A . = C ;
A ++ . = E ;

Anal i of Add:

,

.

3 4--- (1)

,

1,

≤ + -1

,

(1)

20--- ( ), 23--- ( )

A A : (+)

Anal i of do bling capaci :

, . 1

A , . 2

$$\left(\sum_{i=1}^{k} 2^{i}\right) = \quad (2^{+1}) = \quad (2\ )$$

. > 2 -1 + ≥ . ,

(.) = (+)

, ,

A (+).

A .

E : 93-2,6, 94-9

In rod c ion

A (

×) , :

Fig.2.2(a) 5×3

Fig. 2.2(b) 6×6

A ×

A

:

A ---

, . B

,

.

A ---

. 0 .

```
//          <     ,          ,        >,              ,
//      -                                                    ;
//                                  .
        :
                          (       ,       );
   //                  ×
   //
                                  ( );
        //                                                    *
                          A     (                  );
                                        (                  );
;
```

< , , >,

< , >.

;

;

:

, , ;

;

A :

:

, , , ;

* A ;

F .2.2 ( ) F .2.3

( ).

Fig.2.3 (a)

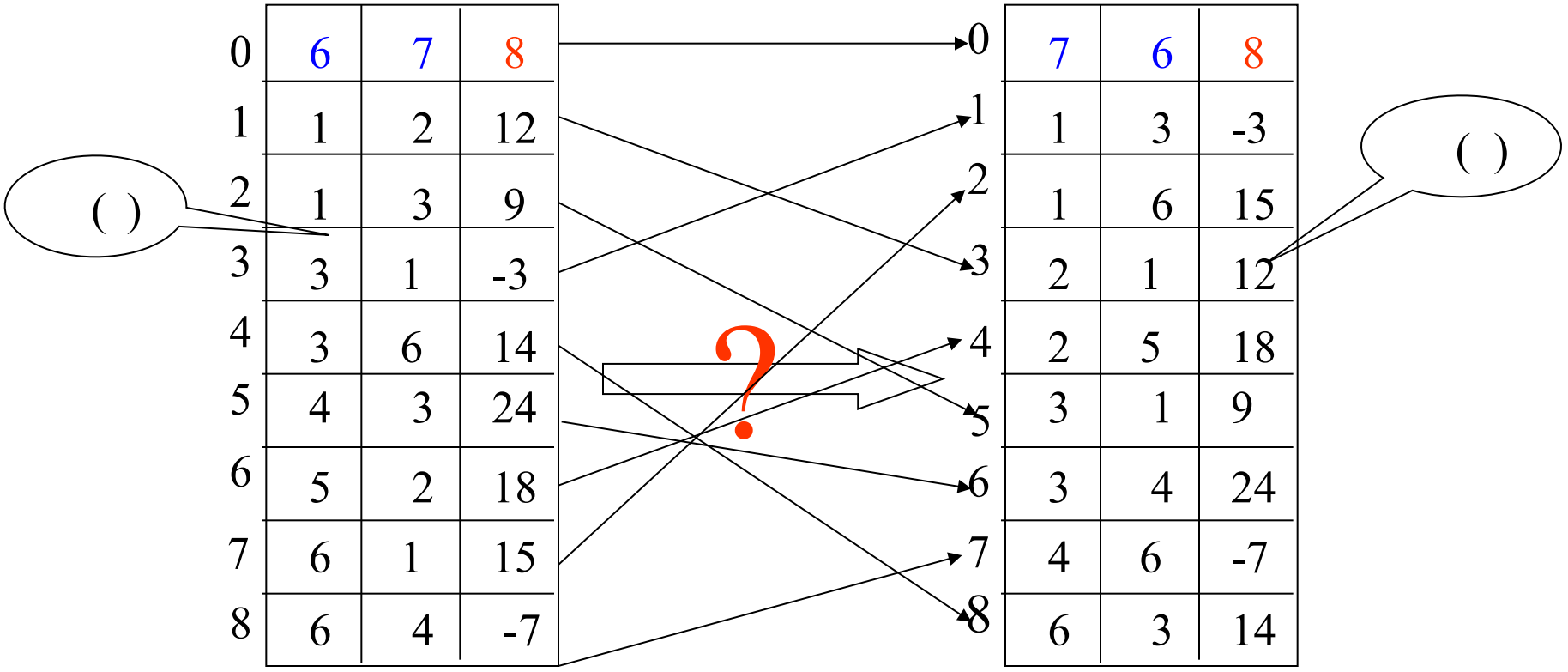
Tran po e:

,

.

F .2.3( ) F 2.3( ).

```
( =0; < ; ++)
    ( =0; < ; ++)
                = ;
( )= ( × )
```


( )
0 6 7 8
1 1 2 12
2 1 3 9
3 3 1 -3
4 3 6 14
5 4 3 24
6 5 2 18
7 6 1 15
8 6 4 -7
?
0 7 6 8
1 1 3 -3
2 1 6 15
3 2 1 12
4 2 5 18
5 3 1 9
6 3 4 24
7 4 6 -7
8 6 3 14
( )

F :

F ( )

✓ (, ,) ✓

✓ (, ,)

;

D :

(, ,)

.

Impro emen :

F ( )

- ✓ **(, ,)**

- ✓ **(, ,)**

	6	7	8
1	1	2	12
2	1	3	9
3	3	1	-3
4	3	6	14
5	4	3	24
6	5	2	18
7	6	1	15
8	6	4	-7

=1

	7	6	8
1	1	3	-3
2	1	6	15
3	2	1	12
4	2	5	18
5	3	1	9
6	3	4	24
7	4	6	-7
8	6	3	14

=2

```
1                                   ::          ( )
2   //                              *
3                           (       ,       );
4       (           > 0)
5       //
6                       B = 0;
```

```
7           (       =0;  <      ;  ++ ) //
8             (       =0; <         ;  ++ )
9         //
10            (     A         .     ==    )
11
12              .   A       C         B .       =  ;
13              .   A       C         B .     =     A          .     ;
14              .   A       C         B++ .       =     A          .       ;
15
16      //              (         > 0)
17               ;
18
```

:

7-15 ---

10 ---

--- (1)

: (*)

A : (1)

:

(*) . = (*)

(2*)--- !

2- ,

(*) :

(=0; < ; ++)

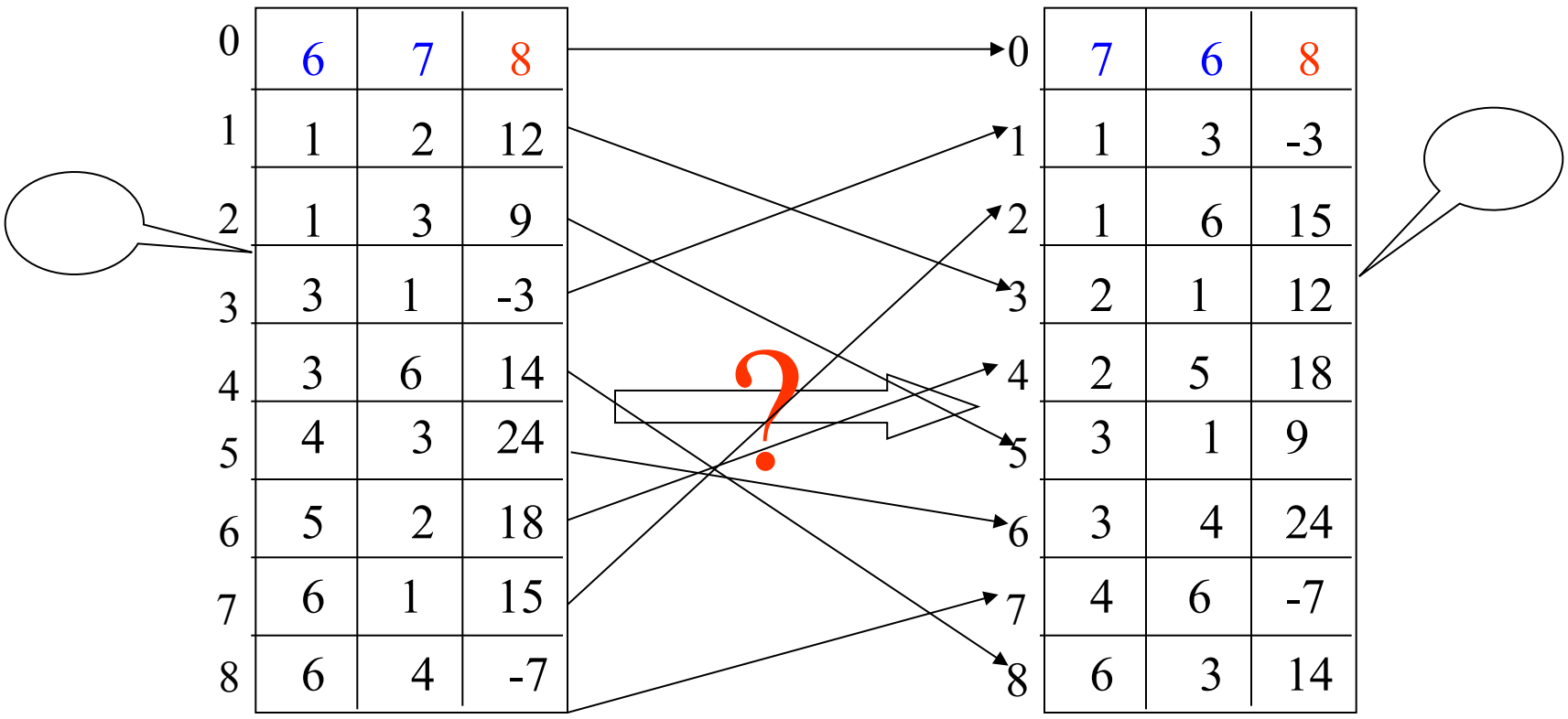
(=0; < ; ++) B = A ;

F :

e ed e

, **:**

(+).


0 6 7 8
1 1 2 12
2 1 3 9
3 3 1 -3
4 3 6 14
5 4 3 24
6 5 2 18
7 6 1 15
8 6 4 -7
?
0 7 6 8
1 1 3 -3
2 1 6 15
3 2 1 12
4 2 5 18
5 3 1 9
6 3 4 24
7 4 6 -7
8 6 3 14

* = B;

B ;

*

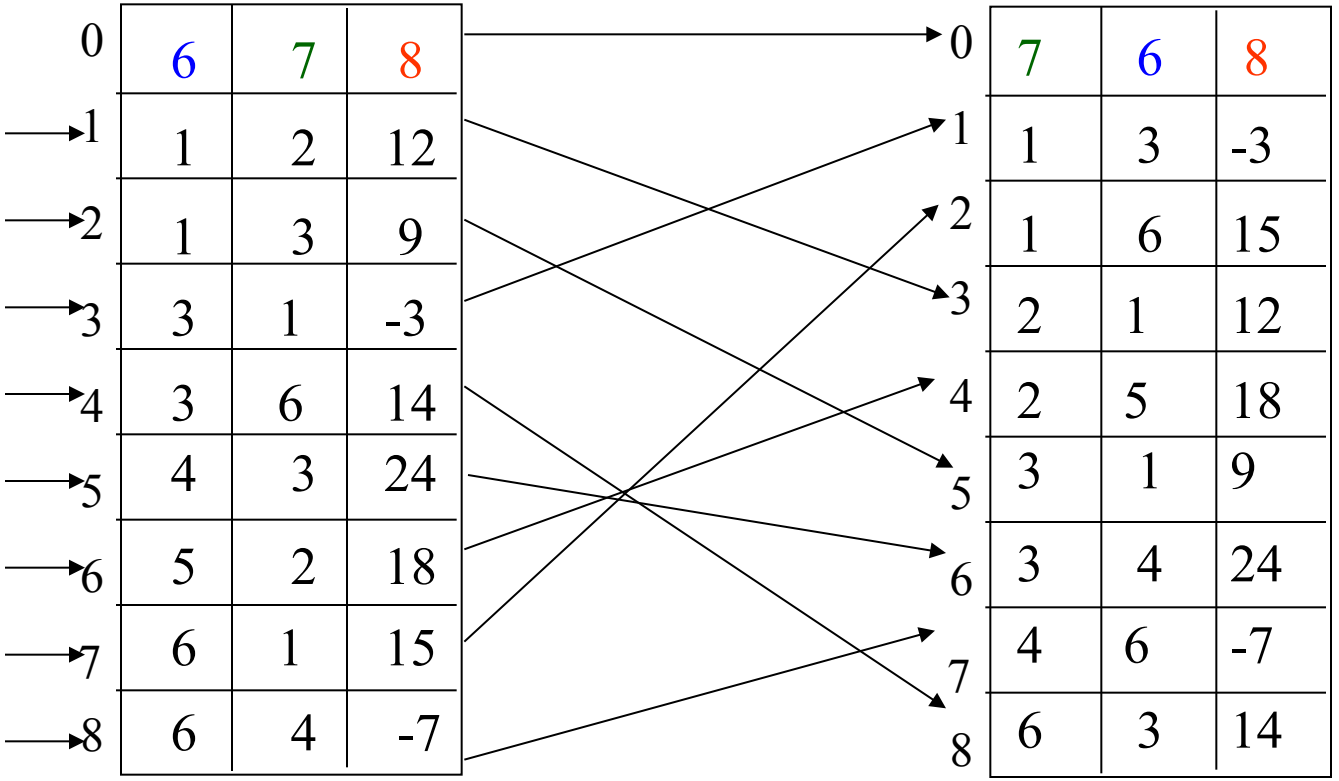
B.

F .

	1	2	3	4	5	6	7
	2	2	2	1	0	1	0
	1	3	5	7	8	8	9

2 4 6 9

3 5 7



```
1                                   ::F                ( )
2   //                              *          (terms+cols)       .
3                       (      ,       ,       );
4       (          > 0)
5       //
6           *           =                   ;
7           *           =                   ;
8       //                      =
9           (           ,           +       , 0); //
10          ( =0; <         ;  ++ )                 A         .      ++;
```

```
11  //                =
12              0  = 0;
13      ( =1; <     ; ++)              =          -1 +          -1 ;
14      ( =0; <       ;  ++)
15       //             *
16            =              A       .    ;
17        .   A       .     =    A       .   ;
18        .   A       .    =    A       .   ;
19        .   A       .       =    A       .       ;
20                    A       .    ++;
21      //
```

```
22                          ;
23                           ;
24    //
25            ;
26
```

A 13, :

	[0]	[1]	[2]	[3]	[4]	[5]
Ro Si e=	2	1	2	2	0	1
Ro S ar =	0	2	3	5	7	7

101 !

Anal i :

3 :

10--- ( )

13--- ( )

14 21--- ( )

9--- ( ), --- (1)

: (+)

.

E erci e : P107-1, 2, 4

A

A = 0, 1, , -1

∈ , 0≤ < , .

AD 2.5

// ;

:

(* ,);

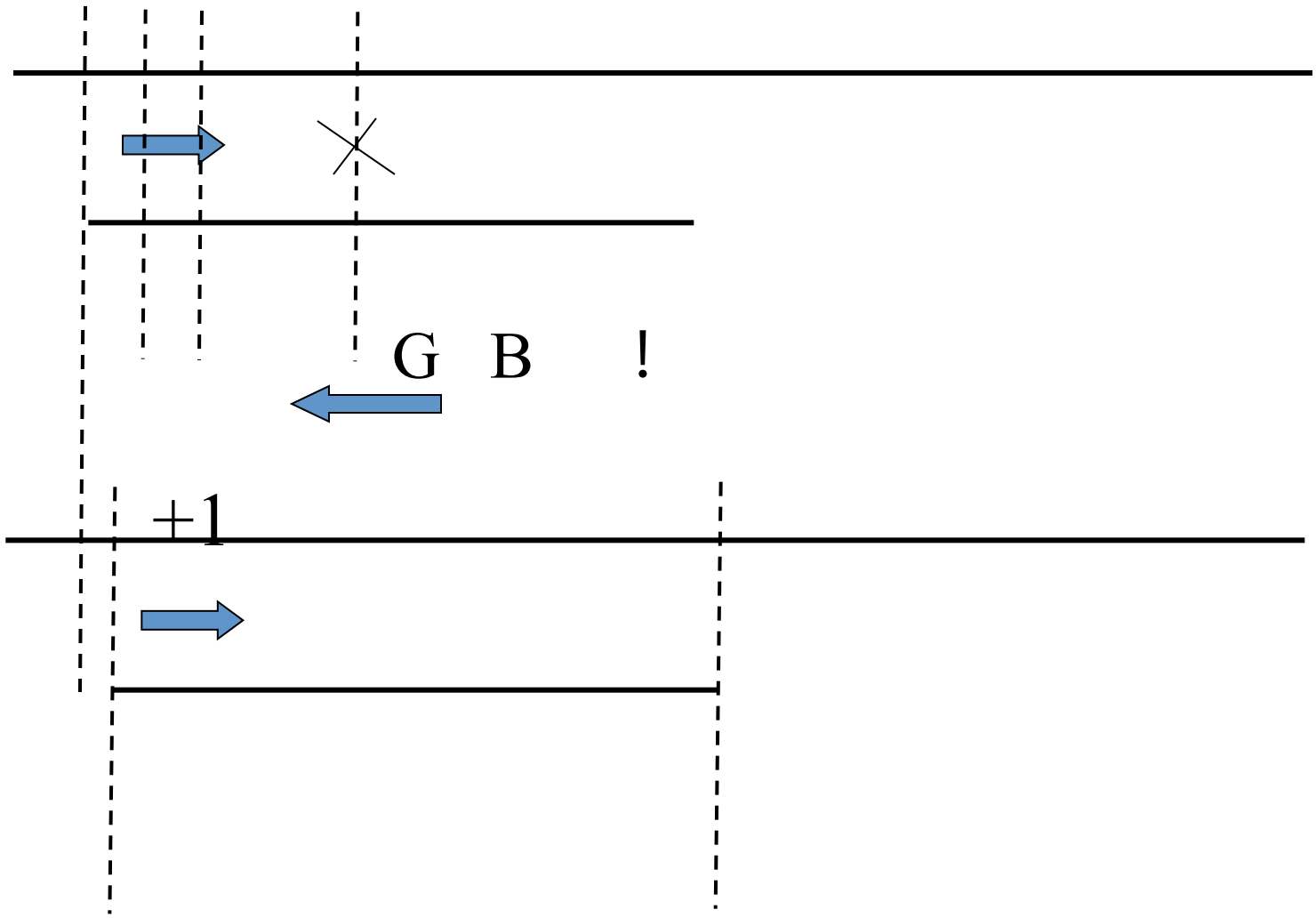
// *

```
                    == (          );
    //    *              ,                    .
                    ! (  );
    //    *                                    .
                ( );
     //                              *
            C       (          );
                    (      ,      );
          F     (            );
    //                                        *
    //                    .        1
    //                *     .
;
```

A me he S ring cla i repre en ed b :

: A

A



```
            ::F     (                )
 //             1                          *     ;
 //                                 *     ,                .
      (     .          ( ) == 0)          -1; //
        (            =0;       <=          ( ) -     .          ( );       ++)
     //
           (      =0;  <     .          ( )&&          +  ==     .       ; ++)
            ( ==      .          ( ))                ; //
      //

            -1;     //
}
```

(*).

:

.

E ,

!

:

-

-

A

C

a d e ca

(+)?

,

.

Ba ic Idea :

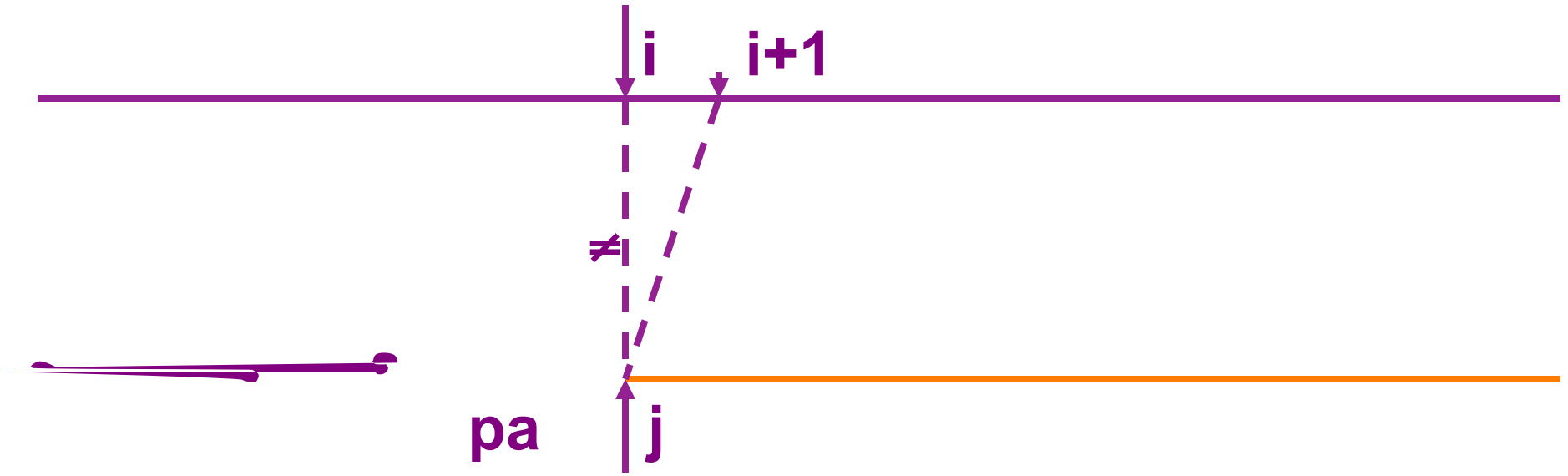
- ---
  -
- ,

  (+).
- ,

  ,

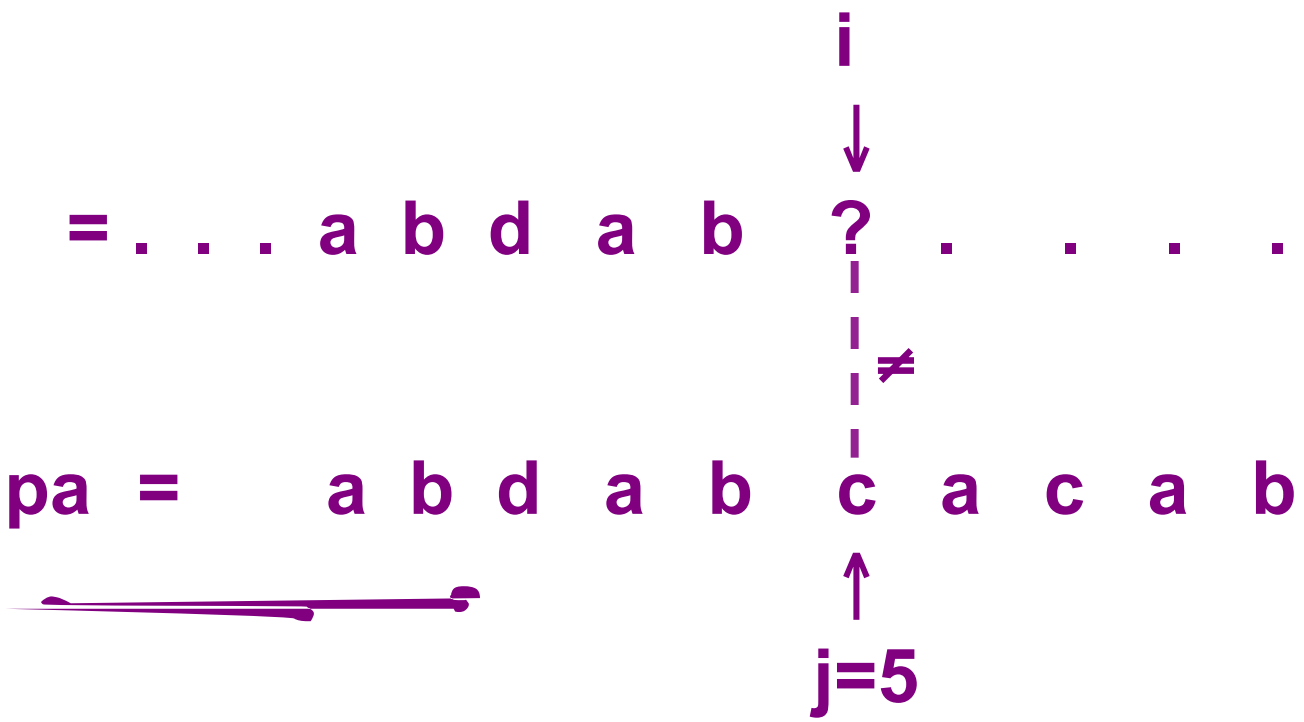
  .

  .

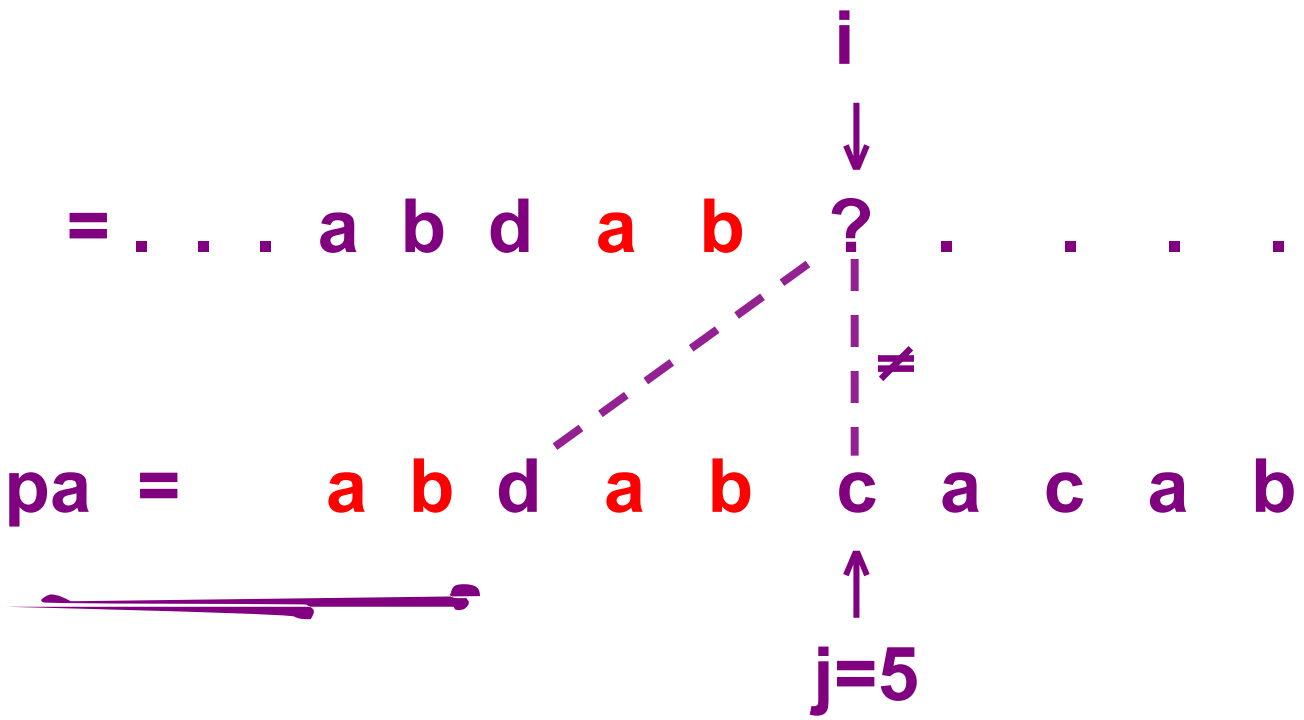


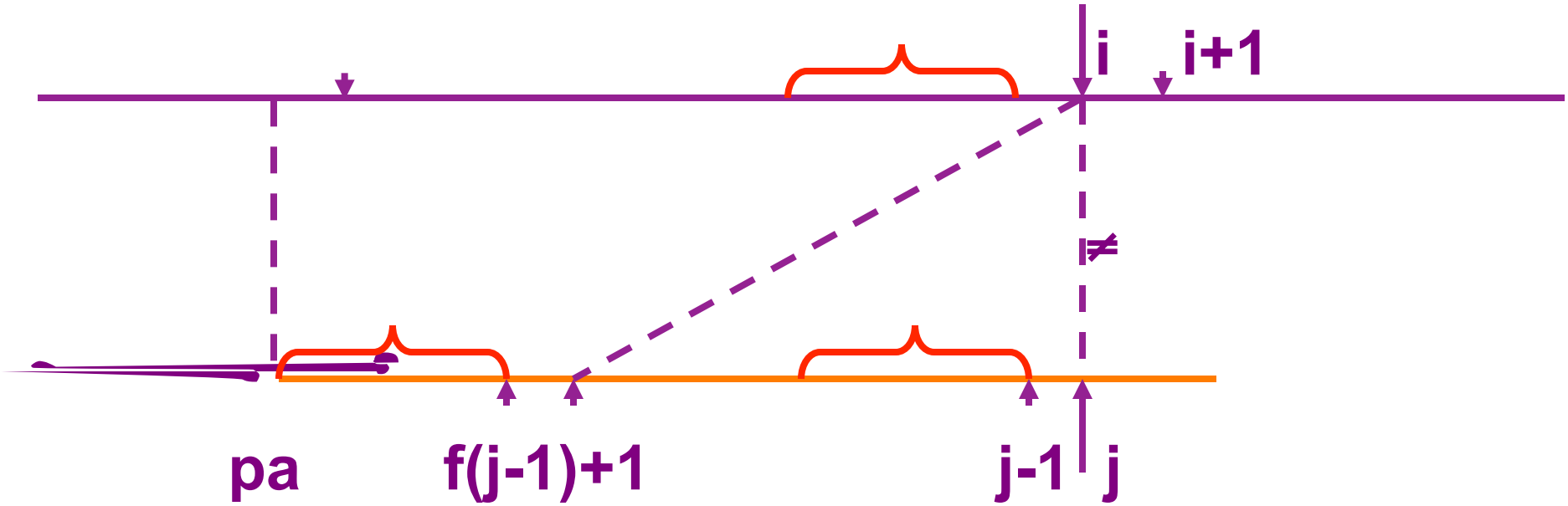
ca e: j = 0

An concre e e ample:



An concre e e ample:





ca e: j ≠ 0

:

D : = 0 1 -1 ,

, :

< , 0 1 = - - +1

≥ 0

( ) =

-1

For e ample, pa = a b c a b c a c a b, e ha e

j	0	1	2	3	4	5	6	7	8	9
pa	a	b	c	a	b	c	a	c	a	b
f	-1	-1	-1	0	1	2	3	-1	0	1

No e:

large : no ma ch be mi ed

k < j : a oid dead loop

F ,

:

- -1 =

0 1 -1 ≠

(-1)+1 ≠ 0.

=0,

+1

0•

, .

F F .

```
1              ::F    F     (              )
2   // D
3                = 0,          = 0;
4                  =     .          ( ),          =          ( );
5            ((        <            ) && (        <            ))
6          (     .             ==             )   //
7              ++;         ++;
8
9
10         (        ==0)
11               ++;
12                 =     .          -1  + 1;
13     ((        <            )            ==0))          1;
14                          -            ;
15  }
```

Anal i of Fa Find:

- 7 11 --- ,

  .

  (7).

- 12 ,

  . (-1)+1< .

C , ( ).

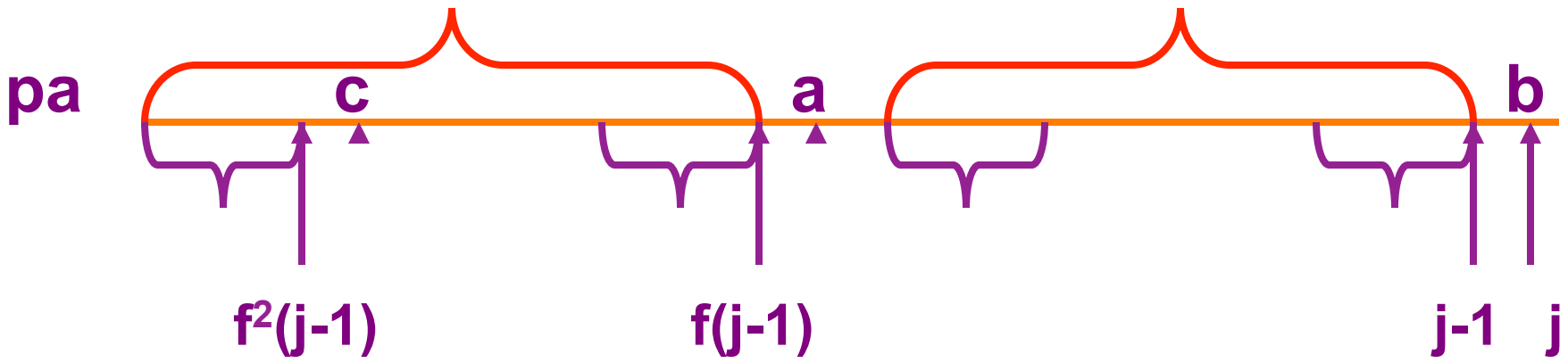
? B

, ( ).

(0)=-1, (-1), ( )

:

= , ( )= (-1)+1



$= \ , \ ( ) = ((-1)) + 1 = {}^{2}(-1) + 1$

,

:

$$
( ) = \begin{cases} -1 & =0 \\ (-1)+1 & \\ & (-1)+1 = \\ -1 & \end{cases}
$$

Anal i of fail:

- (8, ( )<)
- (7) 1 (11), 1 (10).
- 1 7, 1.
- 1 , 1 .

C , ( ).

,

,

(+)

F F .

E : 118-1, 119-7, 9

E 1: 123-8