

1. Given 018 M312172

THRUST INNER PRODUCT

X: 1 2 3 4 5

Y: 6 7 8 9 10

* 6 14 24 36 50

+ 130

YOU CHOOSE OPERATORS.

* +

TO COUNT UNIQUE KEYS, USE \neq +

NOT =

2 INPUTS: U, V SHIFTER 1

33.4 555 778

845 557 78

0 1 1 0 0 1 0 1

34 5 78

(5)

$\rightarrow 4 + 1 \rightarrow 5$

REDUCE BY KEY.

IN / KEYS 1 1 2 3 3 3 7 8 8

DATA 3 1 4 1 5 9 2 6 5

TIME O(N)

OUT (K 1 2 3 7 8
V 4 4 15 2 13)

FIND COUNT LEN OF EACH RUN

KEYS 1 1 2 3 3 3 4 5 5 6 6 6 6) IN

DATA 1 1 1 1 1 1 1 1 1 1 1 1 1

COUNT (KEYS 1 2 3 4 5 6
~~2~~ 2 1 3 1 2 4

THINK RUN LENGTH ENCODING

RUN LENGTH DECODING.

IN: DATA L E N G T H

COUNT 3 1 4 1 5 2

OUT: LLL E N N N N T T T T H H H
0 3 4 8 9 14 16

1. FIND STARTS OF EACH RUN IN OUT

INCLUSIVE SCAN OF COUNTS.

COUNTS 3 1 4 1 5 2

1. SCAN: 0 3 4 8 9 14 16

C → 0 1 2 3 4 5 6 7 8 9 10
→ 0 0 0 1 2 2 2 2 3 4

LOWER BOUND: WHERE DOES EACH COUNT'S ITERATION ELT OCCUR IN SCAN VECTOR?

FINALLY DO GATHER.

NOW HAVE DECODED RUN LENGTH.