

27 119 175 244

Closest pair

$(x_1, y_1), (x_2, y_2)$

$\rightarrow \text{if } |x_1 - x_2| < \text{dist}$

$\rightarrow \text{then dist} = |x_1 - x_2|$

$\rightarrow \text{if } |y_1 - y_2| < \text{dist}$


$\rightarrow \text{then dist} = |y_1 - y_2|$

$\rightarrow \text{if } \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} < \text{dist}$

$\rightarrow \text{then dist} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

$\rightarrow \text{return dist}$

ab \rightarrow 'a' 'b' 'ab' ~~'b'~~


 bus case: 1:2 and 3:1
 for 1 in with arr!
 sum 1 → string sum of arr
 sum 2 → sum of arr
 ↓ 0 ↓

$\checkmark \bar{A} \text{ (n) } \checkmark \bar{A} \rightarrow \text{twinn}$
 $\checkmark \bar{A} \text{ (A) } \checkmark \bar{A} \rightarrow \text{twinn}$
 $\checkmark A \text{ (n) } \checkmark A \rightarrow \text{twinn}$

Handwritten diagram illustrating the recursive steps of the merge sort algorithm:

- Initial array: $[4, 3, 2, 1]$
- Splitting process: $[4] \rightarrow [3, 2, 1] \rightarrow [3, 2, 4]$
- Annotations:
 - $i = 0$
 - $\text{mid} = 3$
 - $O(n^2)$
 - $O(n \log n)$
 - $\text{Recall } n \cdot [\log_2 n] + O(n)$
- Final array: $[4, 3, 2, 1]$
- Annotations:
 - $i = 1$
 - $\text{mid} = 1$
 - $\text{mid} = 1$

all $a b b a$
 \rightarrow if yes \rightarrow no \rightarrow false
 positive? \rightarrow

$a \leftarrow$ $\begin{pmatrix} - \\ + \end{pmatrix}$ -----
 '0' ✓
 'a' ✓
 'b' ✓
 'h'

$$\begin{array}{ccccccc}
 & & & 1 & & & \\
 & & 1 & & 1 & & \\
 & 1 & & 2 & & 1 & \\
 1 & & 1 & & 3 & & 1 \\
 & 1 & 3 & & 3 & 1 & \\
 & & 4 & & 6 & & 4 & 1 \\
 1 & & 5 & & 10 & & 10 & 5 & 1
 \end{array}$$

① $\begin{matrix} 2 & 3 \\ \text{~~~~~} \\ \downarrow \end{matrix}$
ans: $\begin{matrix} 2 & 3 & 2 & 3 \end{matrix}$

findans: $\begin{matrix} '23' & '2' & '3' & '1' \\ \underbrace{\hspace{10em}} & & & \end{matrix}$

$1+23 \quad 1+2 \quad 1+3 \quad 1+''$

$\begin{matrix} 123 & 12 & 13 & 1 \\ 23 & 2 & 3 & 1 \end{matrix}$

1 3 1 4 5

345

for all i, j, k members

$$j^2 = i^2 = -k$$

↑ 3 2

$\text{sum} = 0$
 $k = 4$

size = 4 (boxed)
 2 5 -1 7 -3 -1 -2
 max = 7
 min = -1
 $7 + (-1) = 6$

$\begin{array}{ccc} 1 & 2 & 3 \\ 3 & 2 & 1 \\ 3 & 1 & 2 \\ 1 & 3 & 2 \\ 2 & 1 & 3 \\ 3 & 3 & 1 \end{array}$