

Example: How to find the min element in array ~~A[a], ..., A[b]~~ when we know $A[a] \geq A[a-1] \geq \dots \geq A[i] \leq A[i+1] \leq \dots \leq A[b]$.

$$a=2, b=12, c_1 = 2 + \frac{12-2}{3} = 5$$

$$c_2 = 2 + \frac{2(12-2)}{3} = 8$$

A

...	25	18	17	14	12	11	10	12	13	12	19	...
a	2	3	4	5	6	7	8	9	10	11	12	b

$$A[a] \geq A[c_1] \geq A[c_2] \Rightarrow \text{so search } [c_1, b]$$

$$25 \geq 14 \geq 10$$

~~$$A[c_1] \leq A[c_2] \leq A[b]$$~~
~~$$14 \leq 10 \leq 19$$~~

$$a=5, b=12, c_1 = 5 + \frac{12-5}{3} = 7, c_2 = 5 + \frac{2(12-5)}{3} = 9$$

A

...	14	12	11	10	12	13	17	19	...
a	5	6	7	8	9	10	11	12	b

~~$$A[a] \geq A[c_1] \geq A[c_2]$$~~
~~$$14 \geq 11 \geq 12$$~~

$$A[c_1] \leq A[c_2] \leq A[b] \Rightarrow \text{so search } [a, c_2]$$

$$11 \leq 12 \leq 19$$

$$a=5, b=9, c_1 = 5 + \frac{9-5}{3} = 6, c_2 = 5 + \frac{2(9-5)}{3} = 7$$

A

...	14	12	11	10	12	...
a	5	6	7	8	9	b

$$A[a] \geq A[c_1] \geq A[c_2] \Rightarrow \text{so search } [c_1, b]$$

$$14 \geq 12 \geq 11$$

$$a=6, b=9, c_1 = 6 + \frac{9-6}{3} = 7, c_2 = 6 + \frac{2(9-6)}{3} = 8$$

...	12	11	10	12	...
a	6	7	8	9	b

$$A[a] \geq A[c_1] \geq A[c_2] \Rightarrow \text{Search } [c_1, b] \Rightarrow \text{... } \boxed{11 \ 10 \ 12 \ ...}$$

$$12 \geq 11 \geq 10$$

Can't proceed further because we need at least 4 elements.

So we return the min of these three which is 10.