Class 07

Wednesday, March 23, 2022 8:28 PM

1 2 4 4 6 10 25 26 38 100

7 8 9

$k = 6$

$n - k = 4$

$v = 38$

112 2 6 8 0 14 7 9 3 1

0 0 0 0 0 0 1 1 1 1

L M R

$$N \rightarrow \frac{N}{2} \rightarrow \frac{N}{4} \rightarrow \frac{N}{8} \rightarrow \frac{N}{16} \rightarrow \cdots \rightarrow 1$$

$$= \frac{N}{2^0} \rightarrow \frac{N}{2^1} \rightarrow \frac{N}{2^2} \rightarrow \frac{N}{2^3} \rightarrow \frac{N}{2^4} \rightarrow \cdots \rightarrow \frac{N}{2^x}$$

$$\frac{N}{2^x} = 1 \Rightarrow N = 2^x$$

$$\Rightarrow \log_2(N) = \log_2(2^x) = x \cdot \log_2 2$$

$$\therefore x = \log_2(N)$$

while(L ≤ R)

{ M = L + (R−L)/2

if(arr[M] == elem) → true

if(arr[M] > elem) R = M − 1

else L = M + 1

$L = 15$

$R = 17$

$15 + 17$

$$L + \left(\frac{R-L}{2}\right)$$

$$15 + \frac{2}{2} = 16$$

$$\frac{2L}{2} + \frac{R-L}{2}$$

if(arr[M] > item) R = M - 1

else $L = M + 1$

}

$\longrightarrow$ false

$$\frac{2L}{2} + \frac{R-L}{2} = \frac{2L + R - L}{2} = \frac{L+R}{2}$$

$n = 10$

$n \longrightarrow \sqrt{n}$

$[0, n]$

$[0, 10] \longrightarrow 5 \times 5 > 10$

$\sqrt{10} < 5$

$[0, 5] \longrightarrow 2.5 < 10$

$[2.5, 5] \longrightarrow 3.75 > 10$

$[2.5, 3.75] \longrightarrow 3.125 < 10$

$[3.125, 3.75] \longrightarrow$

$x^2 - 5x + 7 = 0 \longleftarrow [0, 5]$

$L = 0 \quad R = 5 \quad M = 2.5$

$$x_{n+1} = x_n - \frac{f(x)}{f'(x)}$$