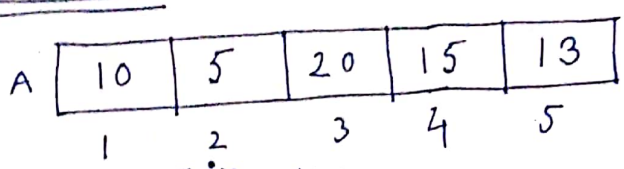
Searching

Linear Search



Key = 20 (keyboard)
No. of elements, n = 5

Key = 20

A[i] = key

i = 1 : A[1] = 20 ⇒ 10 = 20 False

i = 2 : A[2] = 20 ⇒ 5 = 20 False

i = 3 : A[3] = 20 ⇒ 20 = 20 True → "Found", i → 3

Key = 25

i = 1 : A[1] = 25 ⇒ 10 = 25 False

i = 2 : A[2] = 25 ⇒ 5 = 25 False

i = 3 : A[3] = 25 ⇒ 20 = 25 False

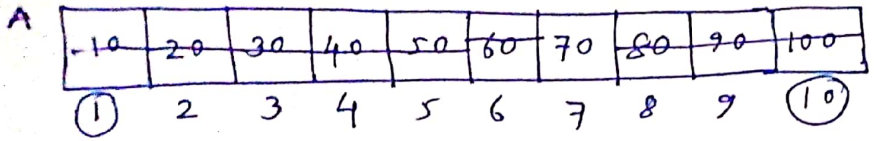
i = 4 : A[4] = 25 ⇒ 15 = 25 False

i = 5 → n : A[5] = 25 ⇒ 13 = 25 False

i = 6 : i > n ⇒ 6 > 5 True → "Not Found"

Algorithm

```
for i = 1 to n
    if (A[i] = key)
        print, "Found", i
        exit loop
    end if
end for
if (i > n)
    print "Not Found"
end if
```

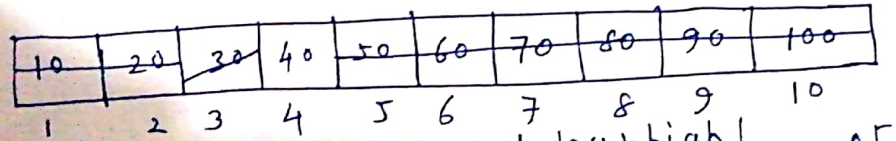


No. of elements, n = 10

Key = 70

low	high	mid = $\lfloor \frac{low+high}{2} \rfloor$	A[mid] = key	A[mid] > key	A[mid] < key
1	10 (n)	mid = $\lfloor \frac{1+10}{2} \rfloor = 5$	A[5] = 70 50 (False)	A[5] > 70 ⇒ 50 > 70 (False)	A[5] < 70 ⇒ 50 < 70 True
6 (mid+1)	10	mid = $\lfloor \frac{6+10}{2} \rfloor = 8$	A[8] = 70 80 (False)	A[8] > 70 ⇒ 80 > 70 (True)	×
6	7 (mid-1)	mid = $\lfloor \frac{6+7}{2} \rfloor = 6$	A[6] = 70 60 (False)	A[6] > 70 ⇒ 60 > 70 (False)	A[6] < 70 ⇒ 60 < 70 True
7 (mid+1)	7	mid = $\lfloor \frac{7+7}{2} \rfloor = 7$	A[7] = 70 ⇒ 70 = 70 (True)	×	×

→ "Found", mid ⇒ 7



key = 35

low	high	mid = $\lfloor \frac{low+high}{2} \rfloor$	A[mid] = key	A[mid] > key	A[mid] < key
1	10 (n)	mid = 5	A[5] = 35 ⇒ 50 = 35 false	A[5] > 35 ⇒ 50 > 35 (True)	~~A[5] < 35~~ ~~⇒ 50 < 35~~ ×
1	4 (mid-1)	mid = 2	A[2] = 35 ⇒ 20 = 35 False	A[2] > 35 ⇒ 20 > 35 False	A[2] < 35 ⇒ 20 < 35 True
3 (mid+1)	4	mid = 3	A[3] = 35 ⇒ 30 = 35 False	A[3] > 35 ⇒ 30 > 35 False	A[3] < 35 ⇒ 30 < 35 True
4 (mid+1)	4	mid = 4	A[4] = 35 ⇒ 40 = 35	A[4] > 35 ⇒ 40 > 35 True	×
4	3 (mid-1)	since low > high, "Not Found"			