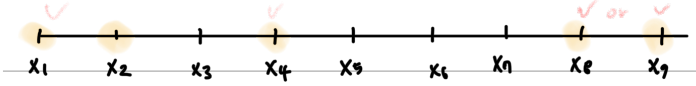
< 이분탐색 >

1. 공유기 설치



공유기 사이의 거리를 기준으로 이분탐색 진행

↓

최소1 ~ 최대 (제일 끝집의 거리)

```python
import sys
n, c = map(int, sys.stdin.readline().split())
house = []
for i in range(n):
    house.append(int(sys.stdin.readline()))
house.sort()

start, end = 1, house[-1] - house[0]
ans = 0

while start <= end:
    mid = (start + end) // 2
    tmp_d = 1000000000
    count = 1
    curr_router = house[0]

    for i in range(1, n):
        if house[i] - curr_router >= mid:
            tmp_d = min(house[i]-curr_router, tmp_d)
            count += 1
            curr_router = house[i]

    if count >= c:
        start = mid + 1
        ans = max(ans, tmp_d)
    else:
        end = mid - 1

print(ans)
```

n=5, c=3

house = [1, 2, 4, 8, 9]

start = 1 , end : 9-1 = 8

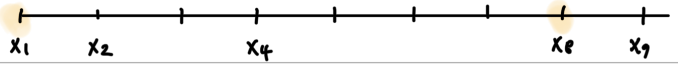
① mid = 4 , curr_router = 1

2-1 ≥ 4 (X)

4-1 ≥ 4 (X)

8-1 ≥ 4 (O) tmp_d = 7 count=2

9-8 ≥ 4 (X)



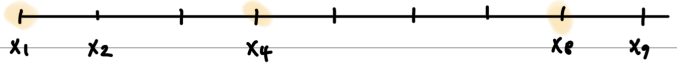
② start=1, end=3, mid=2

2-1 ≥ 2 (X)

4-1 ≥ 2 (O) tmp_d=3, count=2

8-4 ≥ 2 (O) tmp_d=3, count=3

9-8 ≥ 2 (X)



start=3, end=3, mid=3

2-1 ≥ 3 (X)

4-1 ≥ 3 (O) tmp_d=3, count=2

8-4 ≥ 3 (O) tmp_d=3, count=3

9-8 ≥ 3 (X)

$A = \begin{bmatrix} [1\ 2\ 3] \\ [2\ 4\ 6] \\ [3\ 6\ 9] \end{bmatrix} \rightarrow B = [1\ 2\ 3\ 2\ 4\ 6\ 3\ 6\ 9]$

$B[7] = 6$

1 $C[0] = [0][0]$

2 $C[1] = [0][1]$ ← $K \% n$

3 $C[2] = [0][2]$ ← $n \times i \le K < n \times (i+1)$

---

2 $C[3] = [1][0]$

4 $C[4] = [1][1]$

6 $C[5] = [1][2]$

---

3 $C[6] = [2][0]$

6 $C[7] = [2][1]$

(3x2)

9 $C[8] = [2][2]$

1 2 3 4

2 4 6 8

3 6 9 12

4 8 12 16

2. K번째수

1	2	3
2	4	6
3	6	9

임의의 수 a보다 작거나 같은 수의 개수

a=4라고하면

(1행) 4/1 → 4 >=3 → 3

(2행) 4/2 → 2 → 2

(3행) 4/3 → 1 → 1

↓

B=[1 2 2 3 3 4 6 6 9]

∴ B[5] = 4

```python
n = int(input())
k = int(input())
start, end = 1, n*n

while start<= end:
  mid = (start+end) // 2
  cnt = 0

  for i in range(1, n+1):
    cnt += min(mid//i,n)

  if cnt >= k:
    end = mid - 1
  else:
    start = mid + 1

print(start)
```

123
246
369

n=3 k=7

① start=1, end=9, mid=5 [1 2 2 3 3 4 6 6 9]

cnt += min(5//1, 3) ∴ 3

cnt += min(5//2, 3) ∴ 3+2=5

cnt += min(5//3, 3) ∴ 3+2+1=6

6 < 7 : start : 6

② start=6, end=9, mid=7 [1 2 2 3 3 4 6 6 9]

cnt += min(7//1, 3) ∴ 3

cnt += min(7//2, 3) ∴ 3+3=6

cnt += min(7//3, 3) ∴ 3+3+2=8

8 > 7 : end: 6

③ start=6, end=6, mid=6 [1 2 2 3 3 4 6 6 9]

cnt += min(6//1, 3) ∴ 3

cnt += min(6//2, 3) ∴ 3+3=6

cnt += min(6//3, 3) ∴ 3+3+2=8

8 > 7 : end: 5