Pair With Given Difference

Two Sum

Arr = [5, 10, 3, 2, 50, 80]

difference = 78

Brute force

$O(N^2)$

Binary Search

Arr = [2, 3, 5, 10, 50, 80]

start end

Diff = 40

N log N

Two pointer

3 - 2 = 1 ⇒ 40

inc dec

5 - 2 = 3 ⇒ 40

inc dec

50 - 3 = 47 ⇒ 40

50 - 5 = 45 ⇒ 40

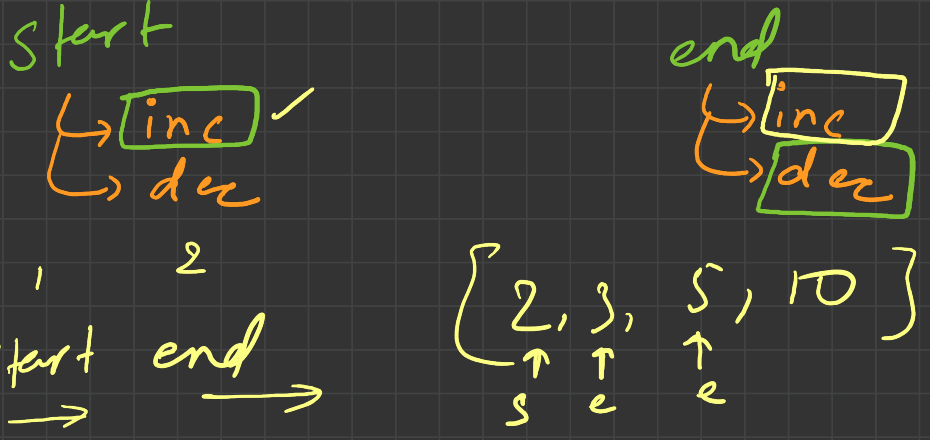
50 - 10 = 40 ⇒ 40

10 - 2 = 8 ⇒ 40

50 - 2 = 48 ⇒ 40

O(N)

```
start = 0 , end = 1
while (end < n) {
  if (arr[end] - arr[start] == target)
      return 1;
  else if (arr[end] - arr[start] < target)
      end ++;
  else
      start ++;
}
return 0;
```



$$arr[end] - arr[start] == k = target$$