

Name: Zanning Wang

zID: z5224151

3.

```
1  sort(array_A)
2  for each pair in (L_i, U_i):
3      index_L_i = binarySearch(L_i)
4      index_U_i = binarySearch(U_i)
5      checkEqual(index_U_i - index_L_i)
```

for line1, sort array A which time complexity is $O(n\log n)$

for line2-4, we find all pair (L_i, U_i) in Array and record their index which time complexity is $O(2n\log n)$, because there are n pairs (L_i, U_i) , for each pairs need $O(2\log n)$ time complexity

for line5, check the length of array is equal to the difference of two index, if not, break the loop and return false. For this step the time complexity is $O(1)$.

Totally, the time complexity is the most time-consuming step, which is $O(n\log n)$.