

# Programming Assignments 1 - Closest Numbers

Hackerrank\_name: d\_murairi

## Question

The screenshot shows the HackerRank website interface for the 'Closest Numbers' challenge. At the top, the user's profile 'd\_murairi' is visible with a notification badge. The challenge title 'Closest Numbers' is prominently displayed, along with the user's current rank (1697965) and points (35/100). A success message banner states: 'You have successfully solved Closest Numbers. You are now 65 points away from the 2nd star for your problem solving badge.' Below this, the problem description is shown, explaining that the task is to find the minimum absolute difference between any two elements in an array. An example is provided: for the array [5, 2, 3, 4, 1], the sorted array is [1, 2, 3, 4, 5], and the minimum difference is 1, achieved by pairs like (1, 2), (2, 3), (3, 4), and (4, 5). The right sidebar contains metadata: Author (HackerRank), Difficulty (Easy), Max Score (35), and Submitted By (58775). Navigation links for 'View discussions', 'View editorial', and 'View top submissions' are also present. The bottom of the image shows the Windows taskbar with various application icons and the system clock indicating 12:44 on 07/02/2021.

**HackerRank** PRACTICE CERTIFICATION COMPETE CAREER FAIR

Practice > Algorithms > Sorting > Closest Numbers

**Closest Numbers** ☆

65 more points to get your next star!

Rank: 1697965 | Points: 35/100

**You have successfully solved Closest Numbers** [Share](#) [Tweet](#)

You are now 65 points away from the 2nd star for your problem solving badge.

[Try the next challenge](#) | [Try a Random Challenge](#)

Problem | Submissions | Leaderboard | Discussions | Editorial | Topics

Sorting is useful as the first step in many different tasks. The most common task is to make finding things easier, but there are other uses as well. In this case, it will make it easier to determine which pair or pairs of elements have the smallest absolute difference between them.

**Example**

$arr = [5, 2, 3, 4, 1]$

Sorted,  $arr' = [1, 2, 3, 4, 5]$ . Several pairs have the minimum difference of 1:  $[(1, 2), (2, 3), (3, 4), (4, 5)]$ . Return the array  $[1, 2, 2, 3, 3, 4, 4, 5]$ .

**Note**

Author: HackerRank  
Difficulty: Easy  
Max Score: 35  
Submitted By: 58775

NEED HELP?

[View discussions](#)  
[View editorial](#)  
[View top submissions](#)

Watch Drag x Closest Num x Screen Cap x Floating Tas x Programmi x screencaptu x alu-rwa-dsa x Java Program x DiracMurai x Qt for Pytho x + -

hackerrank.com/challenges/closest-numbers/problem

Apps Gmail 30 Best Bootstrap... JavaScript fundame... Create a palette - C... Color Hunt - Color... Eloquent JavaScript... Free React Tutorial... React: Getting Start... Top Free Ethical Ha...

**Note**  
As shown in the example, pairs may overlap.  
Given a list of unsorted integers, **arr**, find the pair of elements that have the smallest absolute difference between them. If there are multiple pairs, find them all.

**Function Description**  
Complete the `closestNumbers` function in the editor below.  
`closestNumbers` has the following parameter(s):  
• `int arr[n]`: an array of integers

**Returns**  
• `int[]`: an array of integers as described

**Input Format**  
The first line contains a single integer **n**, the length of **arr**.  
The second line contains **n** space-separated integers, **arr[i]**.

**Constraints**  
•  $2 \leq n \leq 200000$   
•  $-10^7 \leq arr[i] \leq 10^7$   
• All  $arr[i]$  are unique in **arr**.

**Output Format**  
**Sample Input 0**

```
10
-20 -3916237 -357920 -3620601 7374819 -7330761 30 6246457 -6461594 266854
```

View top submissions

RESOURCES

- Greedy Technique
- Sorting
- Pair

RATE THIS CHALLENGE

☆ ☆ ☆ ☆ ☆

MORE DETAILS

- Download problem statement
- Download sample test cases
- Suggest Edits

f t in

Type here to search

98% 1244 07/02/2021

Watch Drag x Closest Num x Screen Cap x Floating Tas x Programmi x screencaptu x alu-rwa-dsa x Java Program x DiracMurai x Qt for Pytho x + -

hackerrank.com/challenges/closest-numbers/problem

Apps Gmail 30 Best Bootstrap... JavaScript fundame... Create a palette - C... Color Hunt - Color... Eloquent JavaScript... Free React Tutorial... React: Getting Start... Top Free Ethical Ha...

**Sample Output 0**

```
-20 30
```

**Explanation 0**  
(30) - (-20) = 50, which is the smallest difference.

**Sample Input 1**

```
12
-20 -3916237 -357920 -3620601 7374819 -7330761 30 6246457 -6461594 266854 -520 -470
```

**Sample Output 1**

```
-520 -470 -20 30
```

**Explanation 1**  
(-470) - (-520) = 30 - (-20) = 50, which is the smallest difference.

**Sample Input 2**

```
4
5 4 3 2
```

**Sample Output 2**

```
2 3 3 4 4 5
```

**Explanation 2**

Screenshot saved  
The screenshot was added to your OneDrive.

Type here to search

98% 1244 07/02/2021

Code submitted

Explanation 2

Here, the minimum difference is 1. Valid pairs are (2, 3), (3, 4), and (4, 5).

**Welcome to the dark side!**

We've introduced a new Dark Mode for a better coding experience. [Try Dark Mode](#)

```
5 import random
6 import re
7 import sys
8
9 # Complete the closestNumbers function below.
10 def closestNumbers(arr):
11     new_arr = arr[:]
12     new_arr.sort()
13     index_sm = []
14     smallest = new_arr[1] - new_arr[0]
15     for number in range(1, len(new_arr)):
```

Screenshot saved to OneDrive

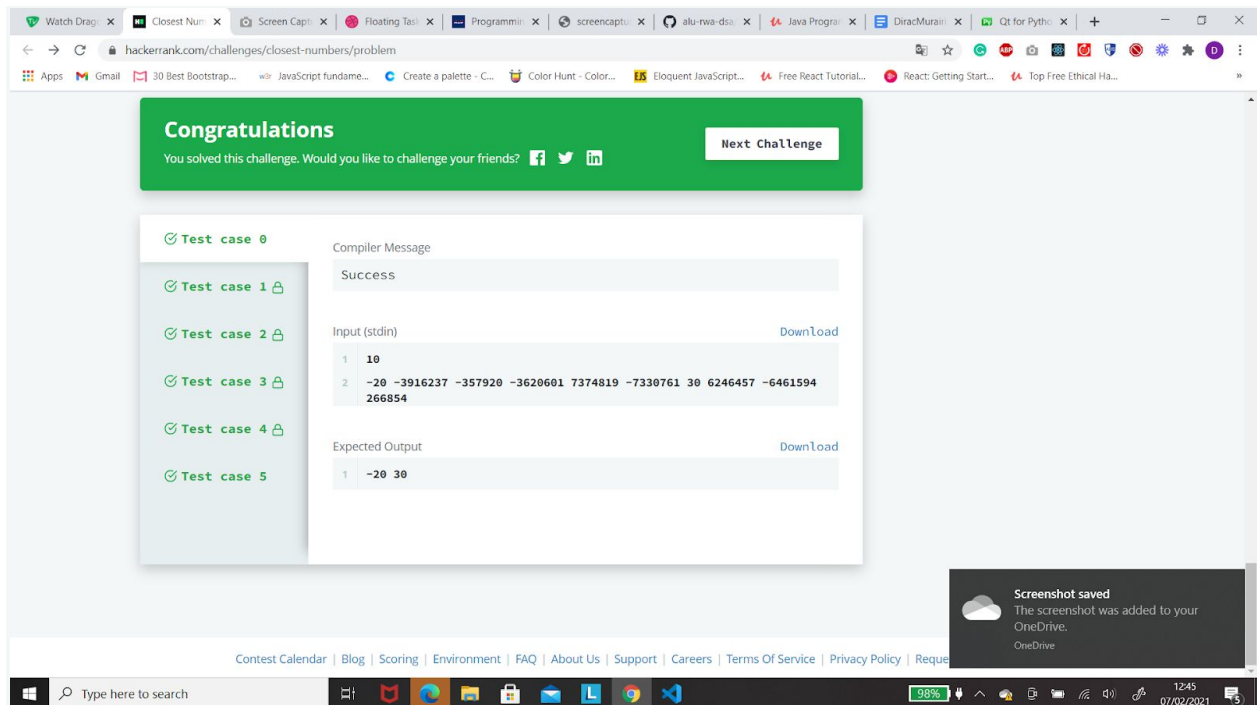
```
1 #!/bin/python3
2
3 import math
4 import os
5 import random
6 import re
7 import sys
8
9 # Complete the closestNumbers function below.
10 def closestNumbers(arr):
11     new_arr = arr[:]
12     new_arr.sort()
13     index_sm = []
14     smallest = new_arr[1] - new_arr[0]
15     for number in range(1, len(new_arr)):
16         if new_arr[number] - new_arr[number - 1] == smallest:
17             index_sm.append(new_arr[number - 1])
18             index_sm.append(new_arr[number])
19         elif new_arr[number] - new_arr[number - 1] < smallest:
20             index_sm = [new_arr[number - 1], new_arr[number]]
21             smallest = new_arr[number] - new_arr[number - 1]
22     return index_sm
23
24
25 if __name__ == '__main__':
26     fptr = open(os.environ['OUTPUT_PATH'], 'w')
27
```

Line: 38 Col: 1

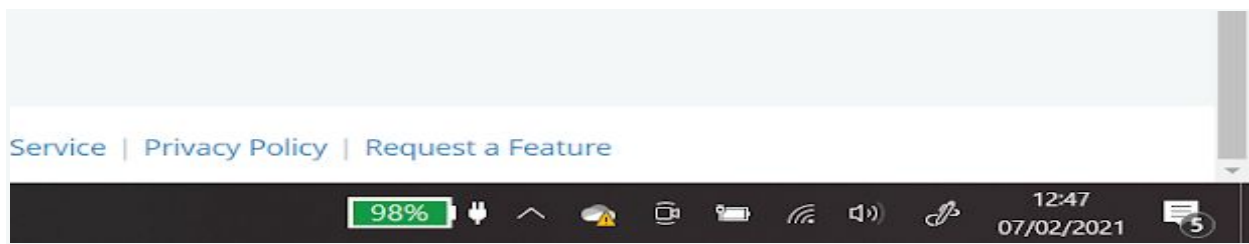
[Upload Code as File](#) ☐ Test against custom input

[Run Code](#) [Submit Code](#)

Requirement passed



Time submitted



Code used

```
def closestNumbers(arr):  
    new_arr = arr[:]   
    new_arr.sort()  
    index_sm = []  
    smallest = new_arr[1] - new_arr[0]  
    for number in range(1, len(new_arr)):  
        if new_arr[number] - new_arr[number - 1] == smallest:  
            index_sm.append(new_arr[number - 1])  
            index_sm.append(new_arr[number])  
        elif new_arr[number] - new_arr[number - 1] < smallest:  
            index_sm = [new_arr[number - 1], new_arr[number]]  
            smallest = new_arr[number] - new_arr[number - 1]  
    return index_sm
```