# HackerRank▉

# Day 1: Quartiles ☆

1 more challenge to get your gold badge!

Points: **19/20**

10
Days of
Statistics
★★★★

| **Problem** | Submissions | Leaderboard | Editorial | Tutorial |

RATE THIS CHALLENGE

☆ ☆ ☆ ☆ ☆

**Objective**

In this challenge, we practice calculating quartiles. Check out the Tutorial tab for learning materials and an instructional video!

**Task**

Given an array, $X$, of $n$ integers, calculate the respective first quartile ($Q_1$), second quartile ($Q_2$), and third quartile ($Q_3$). It is guaranteed that $Q_1$, $Q_2$, and $Q_3$ are integers.

**Input Format**

The first line contains an integer, $n$, denoting the number of elements in the array.

The second line contains $n$ space-separated integers describing the array's elements.

**Constraints**

- $5 \le n \le 50$
- $0 < x_i \le 100$, where $x_i$ is the $i^{th}$ element of the array.

**Output Format**

Print $3$ lines of output in the following order:

1. The first line should be the value of $Q_1$.

2. The second line should be the value of $Q_2$.

3. The third line should be the value of $Q_3$.

**Sample Input**

```
9
3 7 8 5 12 14 21 13 18
```

**Sample Output**

```
6
12
16
```

**Explanation**

$X = \{3, 7, 8, 5, 12, 14, 21, 13, 18\}$. When we sort the elements in non-decreasing order, we get $X = \{3, 5, 7, 8, 12, 13, 14, 18, 21\}$. It's easy to see that $median(X) = 12$.

As there are an odd number of data points, we do not include the median (the central value in the ordered list) in either half:

Lower half (L): 3, 5, 7, 8

Upper half (U): 13, 14, 18, 21

Now, we find the quartiles:

- $Q_1$ is the $median(L)$. So, $Q_1 = \frac{5+7}{2} = 6$.
- $Q_2$ is the $median(X)$. So, $Q_2 = 12$.
- $Q_3$ is the $median(U)$. So, $Q_3 = \frac{14+18}{2} = 16$.

Change Theme    Python 3

```python
import math

def median(sa):
    n = len(sa)
    if (n % 2) == 0:
        return (sa[n//2]+sa[n//2-1])/2
    else:
        return sa[math.floor(n/2)]

if __name__ == '__main__':

    n = int(input())
    a = list(map(int, input().rstrip().split()))

    sa = sorted(a)
    med1, med2, med3 = [0]*3
    if (n % 2) == 0 and n>1:
        hn = n//2
        med1 = median(sa[:hn])
        med2 = (sa[hn]+sa[hn-1])/2
        med3 = median(sa[hn:])
    elif n>2:
        hn = int(math.floor(n/2))
        med1 = median(sa[:hn])
        med2 = sa[hn]
        med3 = median(sa[-hn:])

    print(int(med1),int(med2),int(med3), sep='\n')
```

Line: 30 Col: 1

⬆ Upload Code as File ☐ Test against custom input

Run Code    **Submit Code**

Contest Calendar | Blog | Scoring | Environment | FAQ | About Us | Support | Careers | Terms Of Service | Privacy Policy | Request a Feature