Week 2

Discuss this week's module: Week 2.

Week 2

TR

PA#2 Test Cases

Tim Roughgarden Instructor Week 2 · 2 months ago · Edited

Test cases previously posted by learner SzuHsien Lee.

https://dl.dropboxusercontent.com/u/20888180/AlgI_wk2_testcases/10.txt

https://dl.dropboxusercontent.com/u/20888180/AlgI_wk2_testcases/100.txt

https://dl.dropboxusercontent.com/u/20888180/AlgI_wk2_testcases/1000.txt

Answers are:

size first last median

10 25 29 21

100 615 587 518

1000 10297 10184 8921

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AS

Ankit Shrivastava · 2 months ago

As always these are really great help.

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HG

HAO GU · 2 months ago

Thank you so much! This one is very helpful!!

2 Upvote · Reply

KG

Karolis Gricius · 2 months ago

Anybody got additional test cases?

1 Upvote · Reply

FG

Fan G. · 2 months ago

Really appreciate it!

2 Upvote · Reply

WC

Wan-Ting CHEN · 2 months ago · Edited

I still cannot get it.I have passed the case which use the first element to be the pivot, but the others not. I have read the slide of partition subroutine, but it only give one example (first element).

1 Upvote · Hide 4 Replies

O

Oleg · 2 months ago

The algorithm implies that your pivot element should be very first (at the 0 index) in your array, so be sure you have had swapped 0 index element with your pivot one in cases when you take end/median elements as pivots. Hope it helps

6 Upvote

WC

Wan-Ting CHEN · 2 months ago

Oh! Now I understand. Thanks.

1 Upvote

Bruno Avalos Guerrero · 12 days ago

Guys I'm still stuck on first exercise... I tested with many arrays and my function always outputs the array in the correct order, however my answer for the 1st question is not correct!

Can you give me test cases with their solutions for the first problem? (pivot is always the first element of the array)

Thanks in advance.

0 Upvote

PJ

Pedro L Swaby Jr · a day ago

Hello Bruno. Did you try out the test cases posted on this page? I would give it a try. Maybe you should check how your program counts the number of comparisons. Try these two things. Hopefully it helps.

0 Upvote

A

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JS

James Siemiatkowski · 2 months ago · Edited

I don't understand in what case I'm supposed to count comparisons. Whenever I call partition ? So in case my partition call looks like this partition(array, l, r), inside I should count r - l -1 ? The end result of my sort is correct, but for me the description of the counting part is not really clear.

0 Upvote · Hide 3 Replies

JS

James Siemiatkowski · 2 months ago

`Rather, when there is a recursive call on a subarray of length m, you should simply add m−1 to your running total of comparisons`

Correct me if I'm wrong, but I think r is the last index, l is the first, so r - l gives the length of the subarray.

1 Upvote

JS

James Siemiatkowski · 2 months ago

Just a side question. Should our solution take care of this case described in the video, when there might be no elements bigger than the pivot while traversing the array ?

0 Upvote

Illia · a month ago

In your case (I mean partition(array,l,r)) length of the subarray is NOT r - l, but r - l + 1. Consider such an example: arr = [2,3,4,5,6], indexing starts with 0; then, if your call is partition(arr, 2, 4), length of subarray will be 4 - 2 + 1 = 3, which corresponds to length([4,5,6]) = 3, as your subarray is exactly the latter.

1 Upvote

A

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DP

Dumitru Postoronca · 2 months ago

Another test for the MedianPivot function:

```
1  {0,  1,  2,  3,  4,  5,  6,  7,  8,
2   9,
3  10, 11, 12, 13, 14, 15, 16, 17, 18}
```

should return positon = 9

0 Upvote · Hide 1 Reply

DM

Denis Mejuev · 25 days ago

In my case this source returns 50

0 Upvote

A

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乔静 · 2 months ago

I can't download this cases,anyone can send me a copy?

0 Upvote · Hide 2 Replies

Jaeseok An Jay · 22 days ago

{ 3,9,8,4,6,10,2,5,7,1} This is a case from the first link.

0 Upvote

L

lixiang3608 · 22 days ago

It seems that it is Great Fire Wall's fault :(

0 Upvote

A

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SV

SriHarshitha Velivelli · a month ago

For the median case, what should we do when the array size is 2?

0 Upvote · Hide 2 Replies

MA

Morozov Alexandr · a month ago

I suppose you can take any of them as median, it won't affect partition greatly anyway - it'll be two arrays: one empty and one with one element.

However, generic algorithm for finding median pivot should work for size 2 as well(l_index = 0, mid_index=0, r_index=1)

0 Upvote

Shadi Moadad · a month ago

Base on the description of the problem in question 3, you take the Kth element in the 2K arrays. Thus an array of size 2 (k is 1) then take the first element as the second element

0 Upvote

A

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Anirudh Jayaraman · a month ago · Edited

I'm simply unable to pass the third case!

Can I share my Python code for calculating the median index for an array? Maybe there's something wrong with that.

0 Upvote · Hide 11 Replies

Anirudh Jayaraman · a month ago

Never mind. Found the bug in my code. Done with Week 2!

0 Upvote

Shadi Moadad · a month ago

Did you run with issues with recursion limit? I tried to set the recursionlimit to a large number but it crashed python on windows

0 Upvote

LS

Leonid Stepanenko · a month ago

Man, what was your bug? Because I cannot pass third case neither, everything works just fine with first and last elements as pivots tho :(

0 Upvote

LS

Leonid Stepanenko · a month ago · Edited

Damn me, I also found bug in the choosing median subroutine.

0 Upvote

Gaius Coffey · a month ago

What was the bug with the median subroutine?

This is driving me crazy!

First >> ok

Sorted 10 using 25 comparisons.

Sorted 100 using 615 comparisons.

Sorted 1000 using 10297 comparisons.

Last >> OK

Sorted 10 using 29 comparisons.

Sorted 100 using 587 comparisons.

Sorted 1000 using 10184 comparisons.

Median >> Broken

Sorted 10 using 22 comparisons.

Sorted 100 using 573 comparisons.

Sorted 1000 using 10038 comparisons.

0 Upvote

Gaius Coffey · a month ago

Dagnamit. :(

Found the bug. :)

Preparing to shoot myself for being so daft.

0 Upvote

ДП

Дмитрий Полиенко · a month ago

To anyone who only has problem with median tests: you have a bug in median selection. Yes, really. Double-check it. Triple-check it. It's there.

3 Upvote

Anirudh Jayaraman · a month ago

haha, yeah - I second Дмитрий Полиенко

0 Upvote

CF

Cheryl Fernandes · 13 days ago · Edited

I wasn't able to get my median working either because the bug was in the median selection. I am writing my code in JavaScript and was using arr.sort() which was sorting it as a string instead of as numbers. My code worked fine in the first and second case. Whew! Thanks for the tip.

0 Upvote

A

ajit · 9 hours ago

for the test case with 10 elements {3,9,8,4,6,10,2,5,7,1}

The array is getting sorted with 15 comparisons.

Does that seem right or its way off?

0

A

ajit · 7 hours ago

A

ok

10 25

100 615

1000 9914 but should be 10297 and not sure why.

0

A

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Marc Capelo · a month ago

I'm confused, on the test cases I get the answer + len(file) each time :/ Any ideas?

0 Upvote · Reply

D

dead · a month ago

Already passed the first two cases but still can't get the third case...I set median is (low+high)/2, where the low is the first position of the subarray and high is the last one, but it failed.....I've also tried (low+high+1)/2, also failed...any suggestion?

0 Upvote · Hide 8 Replies

MA

Morozov Alexandr · a month ago

Probably (low+high-1)/2. Try some examples or write tests.

0 Upvote

Shadi Moadad · a month ago

For the median, if zero based: size/2 - 1 if even and size/2 if odd

Make sure to have the right alignment from the start of the array in case you are using in place sorting

Here is a snippet in java just for the a,b,c indexes and values for an in place sorting where start/end idx are the subarray we are sorting

```
1     int size = endIdx - startIdx + 1; //Since both sides
          are inclusive
2     int aIdx = startIdx;
3     int bIdx = startIdx + (size % 2 == 0 ? size/2 - 1 :
          size/2);
4     int cIdx = endIdx;
```

4 Upvote

Frederico Cassis Ribeiro Santos · a month ago

So after I find the median of three, can I just swap it with the first element of the array and do like the first question? I am doing this but I cant get the right answer

0 Upvote

Frederico Cassis Ribeiro Santos · a month ago

I cant get the count right in case 2 and 3, altough I sort the array correctly always

0 Upvote

AK

Arjun Khera · a month ago

it looks like you are not implementing the partition subroutine as mentioned in the course . If you have passed the first case then , your quicksort and main procedures remain unchanged for the other two parts as well .All you have go to do in the partition subroutine ,

1.For case 2 is to swap the first and last element

2.For case 3 is to find the median of the first,last and middle element and swap it with the first .

the rest of the code is same as case 1. Hope you get it right :)

2 Upvote

VS

Vinay Sachdev · a month ago · Edited

You can also do like

int aIndx = low;

int bIndx = low + (high - low)/2;

int cIndx = high;

0 Upvote

PL

Philippe Laroque · a month ago

thank you shadi, you gave me the answer to my median computation problem (I used n/2 wether n even or odd!) ;)

0 Upvote

Frederico Cassis Ribeiro Santos · a month ago · Edited

I was using high - low / 2 for mid, forgot to sum low. That was the problem, thanks Vinay

0 Upvote

A

Reply

Reply

RV

Ravikiran Vishnuvajhala · a month ago

These samples have been extremely helpful. Thank you for posting them.

0 Upvote · Reply

AK

Arjun Khera · a month ago

I am currently trying the second case first wherein we have to use the last element as pivot , however i am getting the following answers as number of comparisons ,

for 10 : 29

for 100:588

for 1000:10675

i get the correct answer for first test case and also what intrigues me is that my code always outputs the correct sorted array , so there no issue as far as the correct implementation of quicksort is concerned .As far as i see , in order to get the number of comparison's all one need to sum is r-p(c++) wherein r is the last index and p the first . Please advice

1 Upvote · Hide 3 Replies

AK

Arjun Khera · a month ago

I found the error , this course involves exchanging the first element with the selected pivot , i erred because for in the second case i followed the instructions as given in cormen , directly partitioning without exchanging with the first element . Finally done all three :)

3 Upvote

Manish · 23 days ago

Arjun. exchanging the first element? Can you please explain?

0 Upvote

AK

Arjun Khera · 23 days ago

Once you find the pivot , suppose the 7 th element turns out to be the pivot , then you must swap the first and the seventh(pivot) elements . After this apply the partition subroutine as given in the lectures .

2 Upvote

A

Reply

Reply

A

Akhil · a month ago

can anyone provide me with a small sample input and sample output for first question.
thanks

0 Upvote · Hide 3 Replies

SK

Satyanarayana Kakollu · a month ago

5, 4, 3, 2, 1

left => num compares = 10

right => num compares = 10

median => num compares = 6

1 Upvote

JS

James Song · 25 days ago

For 10.txt, is the last=29?

Here is how it works:

(3,9,8,4,6,10,2,5,7,1),(count=m-1=9)

1,(9,8,4,6,10,2,5,7,3),(count=0+8)

(2)3(4,6,10,9,5,7,8),(count=0+6)

(4,6,7,5)8(10,9),(count=3+1)

(4)5(7,6),(count=0+1)

Total=9+8+6+3+1+1=28

3 Upvote

CF

Cheryl Fernandes · 13 days ago

For 10.txt, using the "median-of-three" pivot rule, here is how it works:

(3,9,8,4,6,10,2,5,7,1) (count=9)

(1,2) 3 (8,6,10,9,5,7,4) (count = 1+6)

(6,4,5,7) 8 (9,10) (count=3+1)

(5,4) 6 (7) (count=1)

Total=9+1+6+3+1+1=21

0 Upvote

A

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