

Homework 4 hints

Note: The list variable name is made up for this review. You will have to use the correct list variable name for your HW.

Homework 4

For the homework, you cannot change the template codes that was provided, if you change anything it will not pass my tests. You must work within the template codes to get the results.

- a. The question states to swap first and last items in list.

① first draw a diagram

one-ten	0	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10	

what we want to do is

one-ten	0	1	2	3	4	5	6	7	8	9	10
	10	2	3	4	5	6	7	8	9	1	

② so we know $\text{one-ten}[0] = 1$
 $\text{one-ten}[9] = 10$

we want to make it such that
 $\text{one-ten}[0] = 10$
 $\text{one-ten}[9] = 1$

③ how to do that? we can't just do this because it only works for this list. we need to make it generic so it works for all lists.

④ let's look at the process and you can use it to change to make your code work.

$$\text{temp} = \text{one-ten}[0]$$



$$\text{one-ten}[0] = \text{one-ten}[9]$$



$$\text{one-ten}[9] = \text{temp}$$



hint: the length of the list changes

b. Shift right and move last to first position

① Draw diagram

0	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10



0	1	2	3	4	5	6	7	8	9
10	1	2	3	4	5	6	7	8	9

② let's think

0	1	2	3	4	5	6	7	8	9
one-ten	1	2	3	4	5	6	7	8	9

we want to shift right

③ if we shift right then, we lose $\text{one-ten}[9] = 0$ as it will be replaced by the value 9 from $\text{one-ten}[8]$.

④ So, we first store the value of the last index
 $\text{temp} = \text{one-ten}[9]$

$\boxed{10}$
temp

⑤ now we shift. looking at the diagram
we should start from the right or end of list.
so, $\text{one-ten}[9] = \text{one-ten}[8]$

$$\text{one-ten}[8] = \text{one-ten}[7]$$

$$\text{one-ten}[7] = \text{one-ten}[6]$$

... and so on until
 $\text{one-ten}[0]$ we stop.

We can then see that

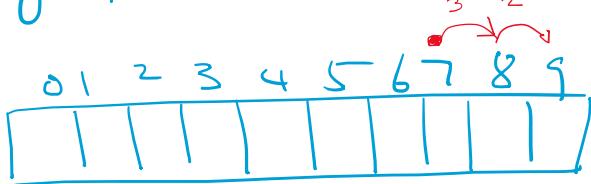
$$\text{one_ten}[9] = \text{one_ten}[8]$$

$$\text{one_ten}[8] = \text{one_ten}[7]$$

$$\boxed{\text{one_ten}[i] = \text{one_ten}[i-1]}$$

this will
be the
body of the
loop!

- (5) Now develop the for loop to keep moving from one element to next one at a time.



- ① we start from here
- ② copy the value from index 8 to 9
- ③ step one back
- ④ continue back to step 3 until we hit index 0

You would have to use the for index in range(start, end, step)
very similar to one of the question in HW3, credit card.

- (1) last step, set the first index to the value of temp

$$\text{one_ten}[0] = \text{temp}$$

c. You can figure it our yourself

d. Replace each element except the first and last by the larger of its two neighbors.

① Draw diagram

0	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10

first and last elements don't change

② Now, we compare neighbors

list

0	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10

comparing neighbors $3 > 1$ so, 2 is replaced with 3

list[0] list[2]

③ move one down

0	1	2	3	4	5	6	7	8	9
1	3	2	4	5	6	7	8	9	10

compare neighbors $4 > 3$, 4 is greater, replace 3 with 4

④ keep moving down until reached the end of list.

Let's look at the second run for part d.
where

$$\textcircled{1} \quad \text{one_ter} = [12, 20, 10, 14, 54, 16, 75, 38, 79, 103]$$

↓ ↓
 first and last stay

② $\left[\begin{matrix} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 12 & \cancel{20} & 10 & 14 & 54 & 16 & 75 & 38 & 79 & 103 \end{matrix} \right]$

③ $[12, \underline{12}, \cancel{14}, \underline{14}, 54, 16, 75, 39, 79, 103]$

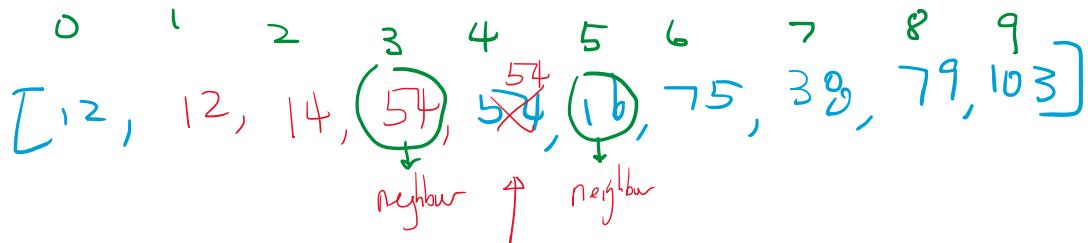
Comparing neighbors $12 < 14$, 14 is greater
1st [1] 1st [3] replace 10 with 14

(4) 

$$[12, 12, \textcircled{14}, \cancel{44}, \overset{54}{\cancel{54}}, \textcircled{54}, 16, 75, 38, 79, 103]$$

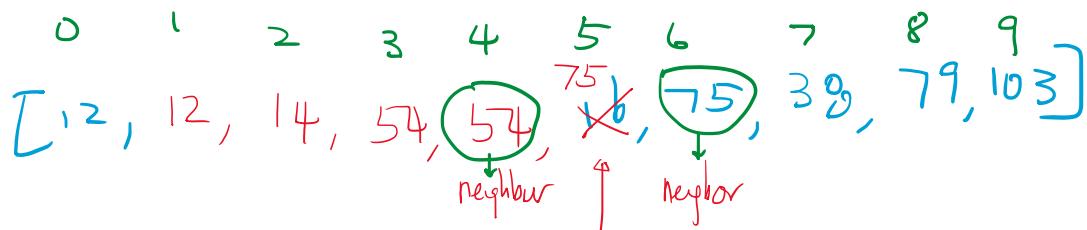
Comparing neighbors $14 < 54$, 54 is greater, replace 14 .
list $\boxed{2}$ list $\boxed{4}$

(5)



comparing neighbours, $54 > 16$, so 54 replaces 54

(6)



compare again $54 < 75$, so 75 replaces 16

* by now I hope you get the idea.

- e. Remove middle- that you can figure it out using integer divide and hint you could use .pop() from lab 4 notes , but you don't have to if you have another way to do it.
- f. Hint use .pop() see lab notes at the bottom of lab 4, again you can use other ways without .pop()
- g. We did largest in class when we learn loops, now you can figure out how to find second largest
- h. Increasing order – just check the next element to the right if its bigger.
- i. Similar to h. just check if next element same value once you find one done.
- j. This is different from item i. this question asks if there are duplicates anywhere on the list. So you have to take the first one compare with each element, if same value then done, if not move to the second element and go down the list...

Please note that you have to learn how to figure things out. That is how you will learn to program.

Note you may have other solutions to accomplish each of the function task and that is absolutely fine with me, the only thing you cannot do is change the codes(template) that was provided in the homework assignment.