**Insertion**

Start with an even number:

1 2 3 4 5 6

**^**

**Add 3 zeroes at the beginning:**

0 0 0 1 2 3 4 5 6

**^** ^

*Offset is -1*

**Add 3 sevens at the end:**

1 2 3 4 5 6 7 7 7

^ **^**

*Offset is 2*

**Add 3 of the lower median (3):**

1 2 3 3 3 3 4 5 6

^ **^**

*Offset is 2*

**What about this case:**

Starting: 1 2 3 3 4 5 6 7

**^**

Ending: 1 2 3 3 3 3 3 4 5 6 7

^ **^**

*Offset is again 2*

**Add 3 of the higher median (4):**

1 2 3 4 4 4 4 5 6

^ **^**

*Offset is 2*

Start with an odd number:

1 2 3 4 5 6 7

**^**

**Add 3 zeroes at the beginning:**

0 0 0 1 2 3 4 5 6 7

**^** ^

*Offset is -2*

**Add 3 eights at the end:**

1 2 3 4 5 6 7 8 8 8

^ **^**

*Offset is 1*

**Add 3 of the median (4):**

1 2 3 4 4 4 4 5 6 7

^ **^**

*Offset is 1*

So the rule seems to be: if the number of elements being inserted (n) is odd, and the original number of elements is even, the offset is -n/2 if the element being inserted is < the current median, and n/2 + 1 if the element being inserted is >= the current median.

If the original number of elements is odd, the offset is –n/2 – 1 if the element being inserted is < the current median, and n/2 if the element being inserted is >= the current median.

For insertion:

Original number is even:

Number being inserted < the current median: -n/2

Number being inserted >= the current median: n/2 + 1

Original number is odd:

Number being inserted < the current median: -n/2 - 1

Number being inserted >= the current median: n/2

Note that the movement of the median pointer needs to take place AFTER any new node has been added, as the new median could very well end up in the new node.

**Deletion**

Start with an even number:

1 1 1 2 3 3 3 4 4 4 5 6 6 6

**^**

**Remove 3 at the beginning:**

2 3 3 3 4 4 4 5 6 6 6

^ **^**

*Offset is 2*

**Remove 3 at the end:**

1 1 1 2 3 3 3 4 4 4 5

**^** ^

*Offset is -1*

**Remove 3 of the lower median (3):**

1 1 1 2 3 3 3 4 4 4 5 6 6 6

^ **^**

*Offset is 2 from the position that was after the median*

**Remove 3 of the higher median (4):**

1 1 1 2 3 3 3 5 6 6 6

**^** ^

*Offset is -1*

Suppose we have the following:

1 1 1 2 3 3 3 4 4 5

**^**

And we delete the 3 occurrences of the median (3):

1 1 1 2 3 3 3 4 4 5

**^** ^

Here we get the -1 offset again. Hmmm.

What about if the median is the middle

0 1 2 3 3 3 3 4 5 6

**^**

If we delete 3 of the 3’s:

0 1 2 3 3 3 3 4 5 6

**^** ^

Again with the -1.

And what about this case:

0 1 2 3 3 3 3 4 5 6 9

**^**

0 1 2 3 3 3 3 4 5 6 9

**^** ^