

Approach

Absolute difference between two ints = the bigger - the smaller. Therefore,

```
res[i] = (nums[i] - nums[0]) + (nums[i] - nums[1]) + ... + (nums[i] - nums[i - 1])    <--- absolute difference of nums[i] with first i numbers
        + (nums[i] - nums[i]) + (nums[i + 1] - nums[i]) + (nums[i + 2] - nums[i]) + ... + (nums[n - 1] - nums[i])  <--- absolute difference of nums[i] with last n - i numbers
```

after simplification:

```
res[i] = i * nums[i] - (nums[0] + ... + nums[i - 1])    <--- absolute difference of nums[i] with first i numbers
        + (nums[i + 1] + ... + nums[n]) - (n - i) * nums[i]  <--- absolute difference of nums[i] with last n - i numbers
```

That is

```
res[i] = i * nums[i] - prefixSum[i]
prefixSum[n] - prefixSum[i] - (n - i) * nums[i]
```