

CSE 142 Section Handout #7

Challenge Sheet

You are not expected or required to solve these problems. These problems are designed for students who want a fun, extra challenge to test their skills on harder programming problems.

Have fun!

Given an array of integer values and an integer value k , rotate the array to the right by k elements. For example, given the integer array $[1, 2, 3, 4, 5, 6]$ and the value $k = 2$, the array should now be $[5, 6, 1, 2, 3, 4]$. Try to do this operation in only three loops or passes through the array regardless of the length and the size of k . You are also not allowed to construct any new arrays for this problem (operation must be in-place).

More examples:

Input: $[1, 2, 3, 4, 5, 6]$ and $k = 5$

Output: $[2, 3, 4, 5, 6, 1]$

Input: $[1, 2, 3, 4, 5, 6]$ and $k = 13$

Output: $[6, 1, 2, 3, 4, 5]$

Input: $[1, 2, 3, 4, 5, 6]$ and $k = 0$

Output: $[1, 2, 3, 4, 5, 6]$

Input: $[1, 2, 3, 4, 5, 6]$ and $k = 6$

Output: $[1, 2, 3, 4, 5, 6]$

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Solution (One Possible Solution below)

```
public void rotate(int[] nums, int k) {
    k = k % nums.length;
    if (k == 0) return;

    reverse(nums, 0, nums.length - 1 - k);
    reverse(nums, nums.length - k, nums.length - 1);
    reverse(nums, 0, nums.length - 1);
}

private void reverse (int[] nums, int i, int j) {
    for (int index = 0; index < (j - i + 1) / 2; index++) {
        swap(nums, i + index, j - index);
    }
}

private void swap (int[] nums, int i, int j) {
    int temp = nums[i];
    nums[i] = nums[j];
    nums[j] = temp;
}
```