Problem 61: Rotate List

Problem Information

Difficulty: Medium
Acceptance Rate: 0.00%
Paid Only: No

Problem Description

Given the

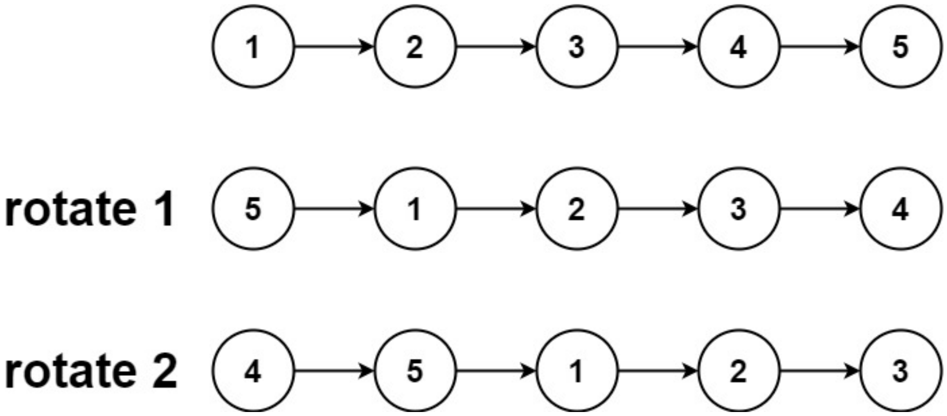
head

of a linked list, rotate the list to the right by

k

places.

Example 1:



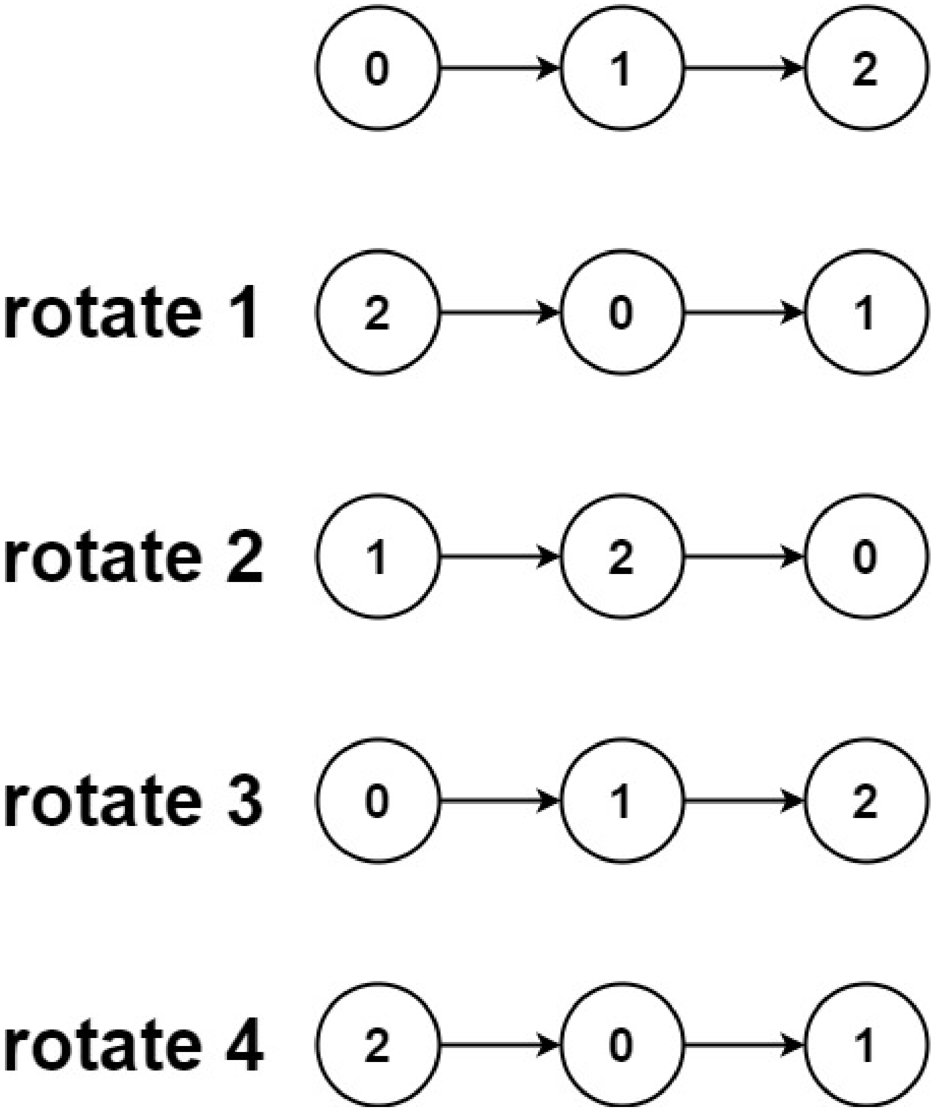
Input:

head = [1,2,3,4,5], k = 2

Output:

[4,5,1,2,3]

Example 2:



Input:

head = [0,1,2], k = 4

Output:

[2,0,1]

Constraints:

The number of nodes in the list is in the range

[0, 500]

.

-100 <= Node.val <= 100

0 <= k <= 2 * 10

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Code Snippets

C++:

```
/**
* Definition for singly-linked list.
* struct ListNode {
* int val;
* ListNode *next;
* ListNode() : val(0), next(nullptr) {}
* ListNode(int x) : val(x), next(nullptr) {}
* ListNode(int x, ListNode *next) : val(x), next(next) {}
* };
*/
class Solution {
public:
ListNode* rotateRight(ListNode* head, int k) {

}
};
```

Java:

```
/**
* Definition for singly-linked list.
* public class ListNode {
* int val;
* ListNode next;
* ListNode() {}
* ListNode(int val) { this.val = val; }
* ListNode(int val, ListNode next) { this.val = val; this.next = next; }
* }
*/
class Solution {
public ListNode rotateRight(ListNode head, int k) {

}
}
```

Python3:

```
# Definition for singly-linked list.
# class ListNode:
# def __init__(self, val=0, next=None):
# self.val = val
# self.next = next
class Solution:
def rotateRight(self, head: Optional[ListNode], k: int) ->
Optional[ListNode]:
```

Python:

```
# Definition for singly-linked list.
# class ListNode(object):
# def __init__(self, val=0, next=None):
# self.val = val
# self.next = next
class Solution(object):
def rotateRight(self, head, k):
"""
:type head: Optional[ListNode]
:type k: int
:rtype: Optional[ListNode]
"""
```

JavaScript:

```
/**
* Definition for singly-linked list.
* function ListNode(val, next) {
```

```
* this.val = (val===undefined ? 0 : val)
* this.next = (next===undefined ? null : next)
* }
*/
/**
* @param {ListNode} head
* @param {number} k
* @return {ListNode}
*/
var rotateRight = function(head, k) {

};
```

TypeScript:

```
/**
* Definition for singly-linked list.
* class ListNode {
* val: number
* next: ListNode | null
* constructor(val?: number, next?: ListNode | null) {
* this.val = (val===undefined ? 0 : val)
* this.next = (next===undefined ? null : next)
* }
* }
*/

function rotateRight(head: ListNode | null, k: number): ListNode | null {

};
```

C#:

```
/**
* Definition for singly-linked list.
* public class ListNode {
* public int val;
* public ListNode next;
* public ListNode(int val=0, ListNode next=null) {
* this.val = val;
* this.next = next;
* }
* }
*/
public class Solution {
public ListNode RotateRight(ListNode head, int k) {

}
}
```

C:

```
/**
* Definition for singly-linked list.
* struct ListNode {
* int val;
* struct ListNode *next;
* };
*/
struct ListNode* rotateRight(struct ListNode* head, int k) {

}
```

Go:

```
/**
* Definition for singly-linked list.
* type ListNode struct {
* Val int
* Next *ListNode
* }
*/
func rotateRight(head *ListNode, k int) *ListNode {

}
```

Kotlin:

```
/**
* Example:
* var li = ListNode(5)
* var v = li.`val`
* Definition for singly-linked list.
* class ListNode(var `val`: Int) {
```

```
* var next: ListNode? = null
* }
*/
class Solution {
fun rotateRight(head: ListNode?, k: Int): ListNode? {

}
}
```

Swift:

```
/**
* Definition for singly-linked list.
* public class ListNode {
* public var val: Int
* public var next: ListNode?
* public init() { self.val = 0; self.next = nil; }
* public init(_ val: Int) { self.val = val; self.next = nil; }
* public init(_ val: Int, _ next: ListNode?) { self.val = val; self.next =
next; }
* }
*/
class Solution {
func rotateRight(_ head: ListNode?, _ k: Int) -> ListNode? {

}
}
```

Rust:

```
// Definition for singly-linked list.
// #[derive(PartialEq, Eq, Clone, Debug)]
// pub struct ListNode {
// pub val: i32,
// pub next: Option<Box<ListNode>>
// }
//
// impl ListNode {
// #[inline]
// fn new(val: i32) -> Self {
// ListNode {
// next: None,
// val
// }
// }
// }
impl Solution {
pub fn rotate_right(head: Option<Box<ListNode>>, k: i32) ->
Option<Box<ListNode>> {

}
}
```

Ruby:

```
# Definition for singly-linked list.
# class ListNode
# attr_accessor :val, :next
# def initialize(val = 0, _next = nil)
# @val = val
# @next = _next
# end
# end
# @param {ListNode} head
# @param {Integer} k
# @return {ListNode}
def rotate_right(head, k)

end
```

PHP:

```
/**
* Definition for a singly-linked list.
* class ListNode {
* public $val = 0;
* public $next = null;
* function __construct($val = 0, $next = null) {
* $this->val = $val;
* $this->next = $next;
* }
* }
*/
class Solution {
```

```
/**
* @param ListNode $head
* @param Integer $k
* @return ListNode
*/
function rotateRight($head, $k) {

}
}
```

Dart:

```
/**
* Definition for singly-linked list.
* class ListNode {
* int val;
* ListNode? next;
* ListNode([this.val = 0, this.next]);
* }
*/
class Solution {
ListNode? rotateRight(ListNode? head, int k) {

}
}
```

Scala:

```
/**
* Definition for singly-linked list.
* class ListNode(_x: Int = 0, _next: ListNode = null) {
* var next: ListNode = _next
* var x: Int = _x
* }
*/
object Solution {
def rotateRight(head: ListNode, k: Int): ListNode = {

}
}
```

Elixir:

```
# Definition for singly-linked list.
#
# defmodule ListNode do
# @type t :: %__MODULE__{
# val: integer,
# next: ListNode.t() | nil
# }
# defstruct val: 0, next: nil
# end

defmodule Solution do
@spec rotate_right(head :: ListNode.t | nil, k :: integer) :: ListNode.t |
nil
def rotate_right(head, k) do

end
end
```

Erlang:

```
%% Definition for singly-linked list.
%%
%% -record(list_node, {val = 0 :: integer(),
%% next = null :: 'null' | #list_node{}}).

-spec rotate_right(Head :: #list_node{} | null, K :: integer()) ->
#list_node{} | null.
rotate_right(Head, K) ->
.
```

Racket:

```
; Definition for singly-linked list:
#|

; val : integer?
; next : (or/c list-node? #f)
(struct list-node
(val next) #:mutable #:transparent)

; constructor
```

```
(define (make-list-node [val 0])
(list-node val #f))

|#

(define/contract (rotate-right head k)
(-> (or/c list-node? #f) exact-integer? (or/c list-node? #f))
)
```

Solutions

C++ Solution:

```
/*
* Problem: Rotate List
* Difficulty: Medium
* Tags: array, linked_list
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* Definition for singly-linked list.
* struct ListNode {
* int val;
* ListNode *next;
* ListNode() : val(0), next(nullptr) {}
* ListNode(int x) : val(x), next(nullptr) {}
* ListNode(int x, ListNode *next) : val(x), next(next) {}
* };
*/
class Solution {
public:
ListNode* rotateRight(ListNode* head, int k) {

}
};
```

Java Solution:

```
/**
* Problem: Rotate List
* Difficulty: Medium
* Tags: array, linked_list
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* Definition for singly-linked list.
* public class ListNode {
* int val;
* ListNode next;
* ListNode() {
// TODO: Implement optimized solution
return 0;
}
* ListNode(int val) { this.val = val; }
* ListNode(int val, ListNode next) { this.val = val; this.next = next; }
* }
*/
class Solution {
public ListNode rotateRight(ListNode head, int k) {

}
}
```

Python3 Solution:

```
"""
Problem: Rotate List
Difficulty: Medium
Tags: array, linked_list

Approach: Use two pointers or sliding window technique
Time Complexity: O(n) or O(n log n)
Space Complexity: O(1) to O(n) depending on approach
"""
```

```
# Definition for singly-linked list.
# class ListNode:
# def __init__(self, val=0, next=None):
# self.val = val
# self.next = next
class Solution:
def rotateRight(self, head: Optional[ListNode], k: int) ->
Optional[ListNode]:
# TODO: Implement optimized solution
pass
```

Python Solution:

```
# Definition for singly-linked list.
# class ListNode(object):
# def __init__(self, val=0, next=None):
# self.val = val
# self.next = next
class Solution(object):
def rotateRight(self, head, k):
"""
:type head: Optional[ListNode]
:type k: int
:rtype: Optional[ListNode]
"""
```

JavaScript Solution:

```
/**
* Problem: Rotate List
* Difficulty: Medium
* Tags: array, linked_list
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* Definition for singly-linked list.
* function ListNode(val, next) {
```

```
* this.val = (val===undefined ? 0 : val)
* this.next = (next===undefined ? null : next)
* }
*/
/**
* @param {ListNode} head
* @param {number} k
* @return {ListNode}
*/
var rotateRight = function(head, k) {

};
```

TypeScript Solution:

```
/**
* Problem: Rotate List
* Difficulty: Medium
* Tags: array, linked_list
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* Definition for singly-linked list.
* class ListNode {
* val: number
* next: ListNode | null
* constructor(val?: number, next?: ListNode | null) {
* this.val = (val===undefined ? 0 : val)
* this.next = (next===undefined ? null : next)
* }
* }
*/

function rotateRight(head: ListNode | null, k: number): ListNode | null {

};
```

C# Solution:

```
/*
* Problem: Rotate List
* Difficulty: Medium
* Tags: array, linked_list
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* Definition for singly-linked list.
* public class ListNode {
* public int val;
* public ListNode next;
* public ListNode(int val=0, ListNode next=null) {
* this.val = val;
* this.next = next;
* }
* }
*/
public class Solution {
public ListNode RotateRight(ListNode head, int k) {

}
}
```

C Solution:

```
/*
* Problem: Rotate List
* Difficulty: Medium
* Tags: array, linked_list
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* Definition for singly-linked list.
* struct ListNode {
* int val;
* struct ListNode *next;
* };
*/
struct ListNode* rotateRight(struct ListNode* head, int k) {

}
```

Go Solution:

```
// Problem: Rotate List
// Difficulty: Medium
// Tags: array, linked_list
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

/**
* Definition for singly-linked list.
* type ListNode struct {
* Val int
* Next *ListNode
* }
*/
func rotateRight(head *ListNode, k int) *ListNode {

}
```

Kotlin Solution:

```
/**
* Example:
* var li = ListNode(5)
* var v = li.`val`
* Definition for singly-linked list.
* class ListNode(var `val`: Int) {
* var next: ListNode? = null
* }
*/
```

```
class Solution {
fun rotateRight(head: ListNode?, k: Int): ListNode? {

}
}
```

Swift Solution:

```
/**
* Definition for singly-linked list.
* public class ListNode {
* public var val: Int
* public var next: ListNode?
* public init() { self.val = 0; self.next = nil; }
* public init(_ val: Int) { self.val = val; self.next = nil; }
* public init(_ val: Int, _ next: ListNode?) { self.val = val; self.next = next; }
* }
*/
class Solution {
func rotateRight(_ head: ListNode?, _ k: Int) -> ListNode? {

}
}
```

Rust Solution:

```
// Problem: Rotate List
// Difficulty: Medium
// Tags: array, linked_list
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

// Definition for singly-linked list.
// #[derive(PartialEq, Eq, Clone, Debug)]
// pub struct ListNode {
// pub val: i32,
// pub next: Option<Box<ListNode>>
// }
```

```
//
// impl ListNode {
// #[inline]
// fn new(val: i32) -> Self {
// ListNode {
// next: None,
// val
// }
// }
// }
impl Solution {
pub fn rotate_right(head: Option<Box<ListNode>>, k: i32) ->
Option<Box<ListNode>> {

}
}
```

Ruby Solution:

```
# Definition for singly-linked list.
# class ListNode
# attr_accessor :val, :next
# def initialize(val = 0, _next = nil)
# @val = val
# @next = _next
# end
# end
# @param {ListNode} head
# @param {Integer} k
# @return {ListNode}
def rotate_right(head, k)

end
```

PHP Solution:

```
/**
* Definition for a singly-linked list.
* class ListNode {
* public $val = 0;
* public $next = null;
* function __construct($val = 0, $next = null) {
* $this->val = $val;
* $this->next = $next;
* }
* }
*/
class Solution {

/**
* @param ListNode $head
* @param Integer $k
* @return ListNode
*/
function rotateRight($head, $k) {

}
}
```

Dart Solution:

```
/**
* Definition for singly-linked list.
* class ListNode {
* int val;
* ListNode? next;
* ListNode([this.val = 0, this.next]);
* }
*/
class Solution {
ListNode? rotateRight(ListNode? head, int k) {

}
}
```

Scala Solution:

```
/**
* Definition for singly-linked list.
* class ListNode(_x: Int = 0, _next: ListNode = null) {
* var next: ListNode = _next
* var x: Int = _x
* }
*/
object Solution {
def rotateRight(head: ListNode, k: Int): ListNode = {

}
}
```

Elixir Solution:

```
# Definition for singly-linked list.
#
# defmodule ListNode do
# @type t :: %__MODULE__{
# val: integer,
# next: ListNode.t() | nil
# }
# defstruct val: 0, next: nil
# end

defmodule Solution do
@spec rotate_right(head :: ListNode.t | nil, k :: integer) :: ListNode.t |
nil
def rotate_right(head, k) do

end
end
```

Erlang Solution:

```
%% Definition for singly-linked list.
%%
%% -record(list_node, {val = 0 :: integer(),
%% next = null :: 'null' | #list_node{}}).

-spec rotate_right(Head :: #list_node{} | null, K :: integer()) ->
#list_node{} | null.
rotate_right(Head, K) ->
.
```

Racket Solution:

```
; Definition for singly-linked list:
#|

; val : integer?
; next : (or/c list-node? #f)
(struct list-node
(val next) #:mutable #:transparent)

; constructor
(define (make-list-node [val 0])
(list-node val #f))

|#

(define/contract (rotate-right head k)
(-> (or/c list-node? #f) exact-integer? (or/c list-node? #f))
)
```