

Exercise I: List Rotation (30 points)

Write a function "rotate" which, given a linked list of integers and a non-negative integer k, rotates the list to the right by k places.

For example:

Given 1->2->3->4->5->NULL and k = 2, the function returns 4->5->1->2->3->NULL.

Remark: no allocation or deallocation operations are permitted, only pointer manipulation.

Exercise II: Palindrom File Processing (40 points)

A palindrome is a string that reads the same forwards or backwards. For instance, "madam", "abba", and "x" are palindromes, while "ab", and "foo" are not. You are to complete a function to determine if a text file contains a palindrome. For this question, a string must be exactly the same forward and backward to be a palindrome, including whitespace and line feeds (so the string "nurses run" is not a palindrome here). We will also consider an empty string (length 0) to be a palindrome.

Complete the definition of function IsPalindrome below so it returns 1 (true) if the content of the given file is a palindrome and returns 0 (false) otherwise.

```
int isPalindrome (char* filename);
```

Remark: you are free to define new data types, to use data structures, and to use the heap memory in allocation. Do not forget to deallocate when finished.

Good luck!