In lab we have built an abstract data type using an opaque object called MYSTRING. I would simply like for you to use the MYSTRING type to write a couple programs that will solve the following problems by using your string data structure.

Part A.

According to Wikipedia:

A **palindrome** is a word, phrase, number, or other sequence of symbols or elements, whose meaning may be interpreted the same way in either forward or reverse direction. Famous examples include "Amore, Roma", "A man, a plan, a canal: Panama" and "No 'x' in 'Nixon'".

Write a program that uses your MYSTRING opaque object to read strings from stdin. Your program should use the newline character to terminate a string but should not include it in the input. Create a function called is_palindrome that will return 1 if a given MYSTRING object is a palindrome and 0 otherwise. Your function will then examine your string one character at a time, pushing all of the characters that satisfy the isalpha() function in the library ctype to a new, temporary, string and making them all a consistent case with toupper() or tolower(). This will remove all the punctuation and whitespace from the string and make the string easier to test. Now, iterate through the string from the front and back until you cross in the middle and if every character is a match then the string is a palindrome and you should return 1. Your main program does not need to prompt or print anything except for the word yes if the string is a palindrome and no otherwise.

Sample input

A man, a plan, a canal: Panama
Go hang a salami, I'm a lasagna hog.
God! A red nugget. A fat egg under a dog.
Binary information has no meaning without context.

Sample output

Yes
Yes
Yes
No

Part B

You have been asked to write a program that will read a book located in the file book.txt and print out all of the four letter words contained in the book so that one word appears on each line to stdout. Use your MYSTRING data type to read in each word from the file ignoring leading white space and terminating on any whitespace character or EOF. You can tell if a character is a whitespace character if

it returns true from the isspace() function located in the library ctype. You only need one string object for this assignment as it should be able to continually overwrite itself with each new word.