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## Palindrome Check using Recursion

Given a string, write a recursive function that checks if the given string is a palindrome or not.

### Examples:

Input : malayalam  
 Output : Yes  
 Reverse of malayalam is also  
 malayalam.

Input : max  
 Output : No  
 Reverse of max is not max.

The idea of a recursive function is simple:

- 1) If there is only one character in string return true.
- 2) Else compare first and last characters and recur for remaining substring.

Below is the implementation of the above idea:

C++

Java

```

// A recursive JAVA program to
// check whether a given String
// is palindrome or not
import java.io.*;

class GFG
{
    // A recursive function that
    // check a str(s..e) is
    // palindrome or not.
  
```

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```
static boolean isPalRec(String str,
                        int s, int e)
{
    // If there is only one character
    if (s == e)
        return true;

    // If first and last
    // characters do not match
    if ((str.charAt(s)) != (str.charAt(e)))
        return false;

    // If there are more than
    // two characters, check if
    // middle substring is also
    // palindrome or not.
    if (s < e + 1)
        return isPalRec(str, s + 1, e - 1);

    return true;
}

static boolean isPalindrome(String str)
{
    int n = str.length();

    // An empty string is
    // considered as palindrome
    if (n == 0)
        return true;

    return isPalRec(str, 0, n - 1);
}

// Driver Code
public static void main(String args[])
{
    String str = "geeg";

    if (isPalindrome(str))
        System.out.println("Yes");
    else
        System.out.println("No");
}
```





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```
}  
}
```

## Output

Yes

**Time Complexity:**  $O(n)$

**Auxiliary Space:**  $O(n)$

## Another Approach :

Basically while traversing check whether ith and n-i-1th index are equal or not.

If there are not equal return false and if they are equal then continue with the recursion calls.

C++

Java

```
/*package whatever //do not write package name here */  
import java.io.*;  
  
class GFG {  
    public static boolean isPalindrome(String s, int i){  
        if(i > s.length()/2)  
        {  
            return true ;  
        }  
  
        return s.charAt(i) == s.charAt(s.length()-i-1) && isPalindrome(s, i+1) ;  
    }  
  
    public static void main (String[] args) {  
        String str = "geeg" ;  
        if (isPalindrome(str, 0))  
        { System.out.println("Yes"); }  
        else  
        { System.out.println("No"); }  
    }  
}
```



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Output

Yes

Time Complexity:  $O(n)$   
Auxiliary Space:  $O(n)$

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