**Question:**

The algorithm for constructing a TM that **accepts even-length palindromes** defined over the alphabets **{0,1}**. Show the working by using the string **110011**.

**Solution:**

For accepting even-length palindrome over the alphabet **{0,1}**, follow the steps given below

* Match the first and last element and erase them and go on doing the same. Once we reach epsilon without any mismatch then the string is even-length palindrome.
* For an even-length palindrome a TM is defined after the machine runs and erases the first and last element without encountering a mismatch. Later on, the Turing machine accepts the string and the string is even-length palindrome.

For the **string 110011**, we encounter the following **three steps**.

1. If starting and ending matches and then erase the first and last one, Result: 1001
2. If starting and ending matches and then erase the first and last one, Result: 00
3. If starting and ending matches and then erase the first and last one, Result: λ