Project: Unsigned reversal

This assignment aims to compute the unsigned reversal distance. You are required to implement the 4-approximation and 2-approximation algorithm.

The input consists of two lines. The first line consists of two integers n and flag. n (which is at most 100,000) is the length of the permutation and flag indicates if we want to output the sequence of reversal (flag=1 means print the reversal sequence). The second line consists of n integers, which represent the permutation of 1, 2, …, n. For example,

The input sequences are in FASTA format. For example,

```
8 1
2 4 3 5 8 7 6 1
```

The output consists of one integer d, which is the reversal distance computed by your program. If (flag=1), the next d+1 lines illustrate the sequence of reversals.

For the above example, the output (for both 4-approx and 2-approx) is

```
4
2 (4 3) 5 8 7 6 1
2 3 4 5 (8 7 6) 1
(2 3 4 5 6 7 8) 1
(8 7 6 5 4 3 2 1)
1 2 3 4 5 6 7 8
```

Detail of the programming task

You are required to write two programs:

1. A 4-approximation algorithm for computing unsigned reversal distance
   java 4approx_unsigned_reversal input.txt output.txt
2. A 2-approximation algorithm for computing unsigned reversal distance
   java 2approx_unsigned_reversal input.txt output.txt

Testing data

Ten sets of testing data are provided. Answers are provided for input1.txt, input5.txt and input7.txt