

**ACSL**  
**American Computer Science League**  

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**LISP Expressions**  
**Intermediate Division**

**2014 - 2015** **Contest #2**

**PROBLEM:** Given a LISP expression, perform operations on the expression. There will be no list elements that also contain a list such as '(A (B (C D)))', which has one atom and one list but the list contains a sublist

**INPUT:** There will be 5 lines of input. Each line will contain a valid LISP expression. There will be a space between each atom and each list. There are no spaces immediately after or immediately before parentheses in a list. The entire expression must be inputted as a single string.

**OUTPUT:** Perform the given operation on the like numbered expression. The 5 operations are:

1. Print the expression with the list in reverse order. The list will contain only atoms.
2. Print the expression with the list written with consecutive duplicates encoded as sublists in (count element) order. The list will contain only atoms.
3. Print the expression with the list written with consecutive duplicates encoded as sublists in (count element) order except that singletons are listed as atoms. The list will contain only atoms.
4. Print the expression with the list written with every  $N^{\text{th}}$  element deleted and where N is the last element of the list.
5. Print the expression written as 2 expressions where the number of lists in first expression is the last element of the expression.

**SAMPLE INPUT**

1. '(A B C D)
2. '(A A A B C C A A D E E E E)
3. '(A A A B C C A A D E E E E)
4. '((4 A) (1 B) (2 C) (2 A) (1 D) (4 E) 2)
5. '((4 A) (1 B) (2 C) (2 A) (1 D) (4 E) 3)

**SAMPLE OUTPUT**

1. '(D C B A)
2. '((4 A) (1 B) (2 C) (2 A) (1 D) (4 E))
3. '((4 A) B (2 C) (2 A) D (4 E))
4. '((4 A) (2 C) (1 D) 2)
5. '((4 A) (1 B) (2 C)) '((2 A) (1 D) (4 E) 3)