Problem 2: $\mathcal{O}$ My!!!

Consider the simple yet powerful programming language PYTRAN, in which the only control statements are iterated loops (`FOR-DO`) and conditionals (`IF-THEN`), statement-blocks are indicated by indenting, and each FOR-loop executes exactly n times for a user-specified value of n. The asymptotic worst-case running time $\mathcal{O}(f(n))$ of a PYTRAN program is the maximum number of times any statement in the program can be executed as a function $f()$ of n. For example, a program consisting of three nested FOR-loops has complexity $\mathcal{O}(n^3)$, as the statements inside the innermost FOR-loop are those that execute the maximum number of times and each such statement executes at most $f(n) = n^3$ times, and a program with no loops has complexity $\mathcal{O}(1)$, *i.e.*, constant time.

Write a program which, given a PYTRAN program, computes and outputs the asymptotic worst case time complexity of that program. Your input will be a file giving the text of a PYTRAN program. You may assume that all indenting is done using spaces, and that all input files represent valid PYTRAN programs.

Sample input #1 (available as file "test2a.dat"):

```
READ n
sum = 0
FOR i = 1 TO n DO
    sum = sum + i
    FOR j = 1 TO n DO
        sum = sum + j
        FOR k = 1 TO n DO
            sum = sum + k
PRINT sum
```

Sample output #1:

```
O(n^3)
```

Sample input #2 (available as file "test2b.dat"):

```
READ n
sum = 0
FOR i = 1 TO n DO
    sum = sum + i
    FOR j = 1 TO n DO
        sum = sum + j
    IF odd(x) THEN
        FOR j = 1 TO n DO
            sum = sum + j
PRINT sum
```

Sample output #2:

```
O(n^2) - quadratic
```

Sample input #3 (available as file "test2c.dat"):

```
READ y, k, n
sum = 0
IF y > k THEN
    FOR i = 1 TO n DO
        sum = sum + i
    FOR j = 1 TO n DO
        sum = sum + j
IF odd(x) THEN
    FOR j = 1 TO n DO
        sum = sum + j
PRINT sum
```

Sample output #3:

```
O(n) - linear
```