

10-th Bulgarian National Olympiad in Informatics

March, 1994

Junior students (12-14 years old)

Let us consider a set C_N of character strings with length of N characters each ($N \leq 20$), satisfying the following properties:

- a) every string contains no more than two different characters: A and B.
- b) every string does not contain two adjacent characters A.

Example: If $N=4$, strings were ABBA, BABA, BBBB, but AABA, ABAA and AAAB are not belonging to C_4 , because of not satisfying the condition b).

Write a program, that solves the following problems:

Problem 1. For any integer N compute the number of elements of set C_N without generating the elements themselves.

Example. If $N=20$, the number of elements of C_N is 17711.

Problem 2. Output some arbitrary K different elements of C_N . The integer K should be entered by the keyboard.

Problem 3. Output the strings of C_N ($1 \leq N \leq 10$) which are symmetric relatively to its centre.

Example. For $N=4$: ABBA, BBBB; For $N=5$: ABBBA, BABAB, ABABA, BBABB.

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