



American Computer Science League

2019-2020

Contest #3

INTERMEDIATE DIVISION

1. Boolean Algebra

How many ordered triples make the following expression FALSE?

$$A(\overline{B} + C) + B(A + \overline{C}) + \overline{ABC}$$

1.

2. Boolean Algebra

Simplify the following expression:

$$\overline{A(B + C)} + \overline{B}(\overline{A} + C)$$

2.

3. Data Structures

How many nodes have only one child in the binary search tree for:

WINDSORCONNECTICUT

3.

4. Data Structures

Given an initially empty stack and the following commands on the stack, what will the next popped item be?

PUSH(T), PUSH(H), PUSH(E), PUSH(K), POP(X), POP(X),
PUSH(I), PUSH(N), POP(X), PUSH(G), PUSH(A), PUSH(N),
POP(X), POP(X), POP(X), PUSH(D), PUSH(I), POP(X), POP(X).

4.



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5. FSA's and Regular Expressions

Which of the following strings can be produced by the following regular expression?

ab^*baa^*baa

- A. $ababaa$
- B. $abbbbbaaaabbaa$
- C. $abaaaabbaa$
- D. $abbbbabab$
- E. $abbbbbaaaba$

5.