

American Computer Science League

2018-2019

Contest #3

SENIOR DIVISION

考号/Exam Code: _____ 姓名/Name: _____ 学校/School: _____

1. Boolean Algebra

Simplify the following Boolean expression:

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

1.

2. Boolean Algebra

How many ordered triples make the following Boolean expression FALSE?

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

2.

3. Data Structures

What is the internal path length of the binary search tree for:

ATLANTICCITYBOARDWALK

3.

4. Data Structures

Define the operation REV as follows: reverse the items in the list.
Begin with an initially empty queue, perform the operations listed.
What is the next item to be popped?

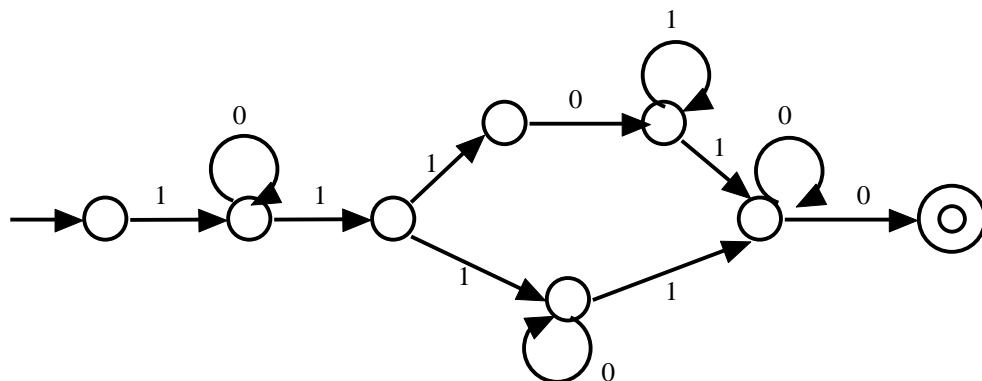
PUSH(C), PUSH(A), PUSH(R), POP(X), REV, PUSH(V), PUSH(A),
PUSH(N), POP(X), REV, POP(X), PUSH(C), PUSH(Y), PUSH(C),
PUSH(L), PUSH(E), POP(X), REV, POP(X), POP(X), REV, POP(X),
PUSH(T), PUSH(R), PUSH(U), PUSH(C), PUSH(K), REV, POP(X),
POP(X), REV, POP(X), REV, POP(X), REV

4.

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5. FSA/Regular Expressions

Find the simplified regular expression for the following FSA:



5.