Course: Theory of Computation (SWE 227)

Marks: 20

TT#01

Let $S(n) = 1 + 2 + \cdots + n$ be the sum of the first n natural numbers and let $C(n) = 1^3 + 2^3 + \cdots + n^3$ be the sum of the first n cubes. Prove the following equalities by induction on n: 2*3 = 6

a.
$$S(n) = \frac{1}{2}n(n + 1)$$

b.
$$C(n) = \frac{1}{4}n^2(n + 1)^2$$

What is finite automata and its application?

What is meant by Regular Language?

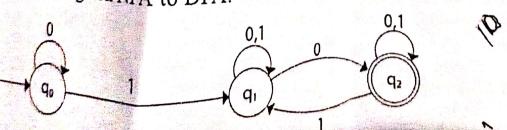
A. Give state diagrams of DFAs recognizing the following languages. In all parts, the alphabet is $\{0,1\}$.

2*3 = 6

a. {w| w is any string except 11 and 111}

b. {w| every odd position of w is a 1}

5. Convert the given NFA to DFA.



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