Computer Science Department,
California State University, Fullerton

Compilers & Languages

ASSIGNMENT 1

Please answer to the questions appropriately, and if you believe a diagram is required, draw one.

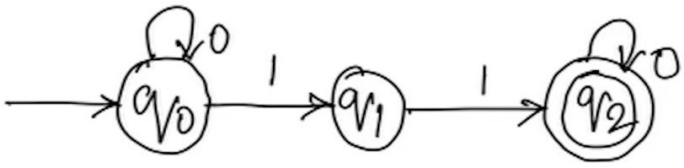
If you want to solve the problems, do so while documenting your steps.

NOTE: Please avoid from writing single-word responses or the just the single solution to a **problem**.

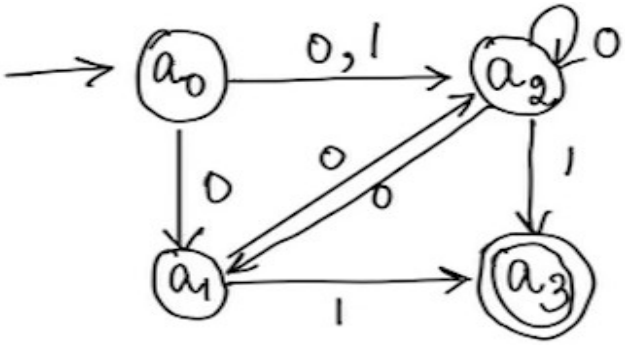
Questions:

1. What is a Compiler? What are the different phases of a compiler (Mention them using the structure of a compiler diagram)
2. Describe a Finite State Automata? What are the differences between a DFA and NFA?
3. Determine a deterministic and non-deterministic finite automata, which accepts the strings that ends with 010 and 111 along with state transition diagram
4. Construct a deterministic finite automata which recognizes a string containing binary representation 0, 1 that accepts the string 011, and starting with 0.
5. What is a Regular Expression? What are the different operations do we have in it and give an example?
6. Construct a NFA which accepts the substring 1101.

7. How many tuples are there in Finite State Automata? What are they? What input strings will be accepted by the below given state transition diagram?



8. How many states are required to accept the string 101011, considering it as minimal Finite automata (Just FSA, it could be either DFA/NFA).
9. Explain the reason why NFA in its name has Non-deterministic and DFA has deterministic and draw the transition table for the following NFA.



10. Convert the following NFA to a DFA?