**National University of Computer & Emerging Sciences, Karachi**Fast

**Spring-2024 CS-Department  
Assignment 1 a**

**Issue Date: Due date:**

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| **Course Code: CS301** | **Course Name: Theory of Automata** |

Instructions:

You must submit the scanned copy of your own handwritten assignment on google classroom within the due date, strong action would be taken on plagiarism cases from straight **zero** in assignment to **Grade F** in course.

1. Determine whether the string 11101 is in each of the following languages.  
   **a) (**0+1)\*

**b)** 1\*0\*1\*

**c)** 110\*01

**d)** (11)\*0 (01)\*

**e)** (1110)\*0\*1\*

**f ) (**11+ 0)\* (00+01)\*

1. Give the regular expressions for the following languages given in Q3.
2. Determine whether the string 01001 is in each of the following languages with the help of an FA. You have to show the transitions clearly with the input tape and pointer.  
   **a)** {0*,* 1} \*

**b)** {0}\*{10}{1}\*

**c)** {010}\*{0}\*{1}

**d)** {010*,* 011}\* {00*,* 01}

**e)** {00} {0}\*{01}

1. Write a code in C or C++ for the DFA machine which accepts all languages upon Σ={a,b,c} not ending on “abc”. You will have to build up the DFA first for your convenience.
2. Develop the NFA of your name using English alphabets. Now convert it into an equivalent DFA.