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Topics Assigned

Closure properties of R.L

1. Union
2. Intersection
3. Complement
4. Difference,
5. Reverse
6. Letter substitution

Session Report

INNOVATIVE TEACHING – LEARNING METHODOLOGY REPORT			
Method Name	Think Share Pair		
Faculty In charge	<u>Dr Jyoti Metan</u>		
Students Group	G1 – G5		
Date	9-12-2021	Time to Task	20 mins
List of activities conducted			
1. Think Share Pair - Closure Properties of Regular Expression			
Summary (Provide in detail report of session progress)			
Discussion and Description of the topic given.			
Steps: 1. Start with main topic 2. Branch out main points 3. Prepare Notes – ppt/ notes with diagrams, examples 4. Give presentation on task by all group members --- Keep iterating for all groups			
Event Outcomes: 1. Self-study and socialism with group mates. 2. Improves Communication and Presentation skills 3. Get rid off stage fear.			

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Work Samples

ACTIVITY: Closure Property of Regular Language
 SUBJECT: AUTOMATA THEORY AND COMPUTABILITY (18CS54)
 DATE: 09/12/2021

*** Closure Under Complement:**

⇒ The Complement of a language L (with respect to an alphabet Σ such that Σ^* contains L) is $\Sigma^* - L$.

⇒ Since Σ^* is always regular, the Complement of a regular language is always regular.

⇒ For any language L on an alphabet Σ , the complement of L is

$$\bar{L} = \{x \in \Sigma^* \mid x \notin L\}$$

Example: $L_1 = \{\text{contains 'a'}\}$
 then, $L_1 = \{a, aa, ba, aa.a, bab, \dots\}$
 $\bar{L}_1 = \{\epsilon, b, bb, bbb, \dots\}$

* The DFA for L_1

* For L_2 is

Done By:
 Anushree D- 1AT1915014
 Ankitha PM- 1AT1915013
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Group-02. 9/12/21
 ATC

Closure under Intersection:

Theorem:- The regular languages are closed under intersection.

Proof:- Not that
 $L(M_1) \cap L(M_2) = \sim(\sim L(M_1) \cup \sim L(M_2))$

We have already shown that all the regular languages are closed under both complement and union thus they are closed under intersection.

Example:-

Fig(a) is DFA L1 which accepts strings that have 0.

Fig(b) is DFA L2 which accepts strings that have 1.

Fig(c) is intersection which accepts that have both 0 and 1.

SUBJECT: ATC DATE: 9/12/21
 SUB-CODE: 18CS54 GROUP: 01

TOPIC: CLOSURE PROPERTIES OF R-E → a) UNION.

CLOSURE - PROPERTIES OF REGULAR - EXPRESSION

a) UNION

The Union of two languages L_1 and L_2 is $L_1 \cup L_2$ is the set of strings that are in either L_1 or L_2 or both $L_1 \cup L_2 = \{x \text{ or } y \mid x \text{ is in } L_1 \text{ or } y \text{ is in } L_2\}$

Let's consider an example:

(i) Starts and ends with different symbols.

$$\Sigma = \{a, b\}$$

This can be written in two ways.

$L_1 = \{ab, aab, abb, \dots\}$
 $L_2 = \{ba, baa, bba, \dots\}$

BY DOING THE UNION OF L_1 & L_2 WE GET:

SUBJECT: AUTOMATA THEORY AND COMPUTABILITY DATE: 09-12-21
 SUBJECT CODE: 18CS54 DAY: THURSDAY

TOPIC: CLOSURE UNDER HOMOMORPHISM
 GROUP NUMBER: 04

DEFINITION: Let L_1 and L_2 be set of alphabets. The homomorphic function $h: L_1 \rightarrow L_2^*$ is called homomorphism i.e., a substitution where a single letter is replaced by a string. If $w = a_1 a_2 a_3 \dots a_n$, then

$$h(w) = h(a_1) h(a_2) \dots h(a_n)$$

EXAMPLE: Let $L_1 = \{0, 1\}$, $L_2 = \{0, 1, 2\}$ and $h(0) = 01$, $h(1) = 12$. What is $h(010)$? If $L = \{00, 010\}$, what is homomorphic image of L?

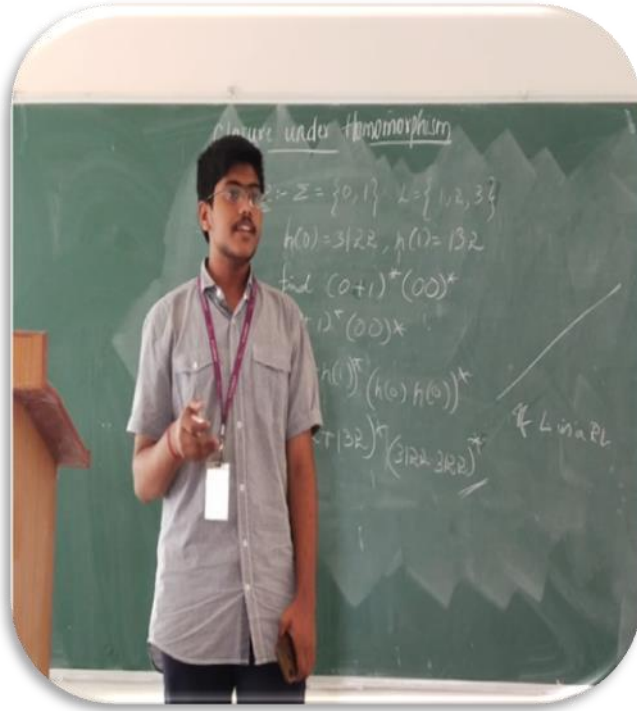
By definition we have $h(w) = h(a_1) h(a_2) \dots h(a_n)$

So, $h(010) = h(0) h(1) h(0)$
 $= 011201$
 $L(00, 010) = L(h(00), h(010))$
 $= L(h(0) h(0), h(0) h(1) h(0))$
 $= L(0101, 011201)$

Therefore,
 $h(010) = 011201$
 $L(00, 010) = L(0101, 011201)$

THEOREM:
 If L is regular and h is homomorphism, then homomorphic image $h(L)$ is regular.

Photos



Photos



Concept Maps

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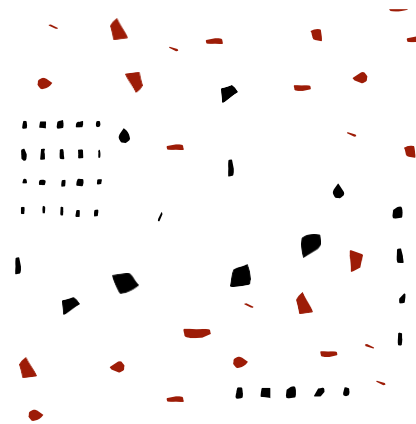
Students Feedback on innovative classroom methods:

Sem: V ISE1 Subject: ATC Faculty Name: DR JYOTI METANI

Sl. No	Evaluation	Strongly Disagree	Disagree	Agree	Strongly Agree
1.	The innovative learning is more engaging than traditional learning.				✓
2.	I would rather watch a traditional teacher led lesson than video/GD/other methods				✓
3.	The innovative methods gives me more class time to explore and practice problems in class.				✓
4.	The innovative classroom gives me opportunities to communicate effectively with other students n learn.				✓
5.	The innovative classroom has helped to improve my interaction with the teacher				✓
6.	I would recommend the innovative classroom to my friends in other colleges.				✓

METHOD - NAME : THINK - SHARE - PAIR (TSP)
TOPIC : HOMOMORPHISM

TEAM - MEMBERS
 • ARSHAY S. KATTI (IAT1915008)
 • ARVIND (IAT1915018)
 • KOMAR ADITYA G.V (IAT1915048)



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5.	The innovative classroom has helped to improve my interaction with the teacher				✓
6.	I would recommend the innovative classroom to my friends in other colleges.				✓

METHOD - NAME : THINK - SHARE - PAIR (TSP)
TOPIC : CLOSURE PROPERTIES (UNION)

TEAM MEMBERS.
 • KEERTHANA V (IAT1815042)
 • KEERTHANA S (IAT1915045)
 • ANU DEVARAJU (IAT1915014)
 • ANARGHYA S (IAT1915010)

