

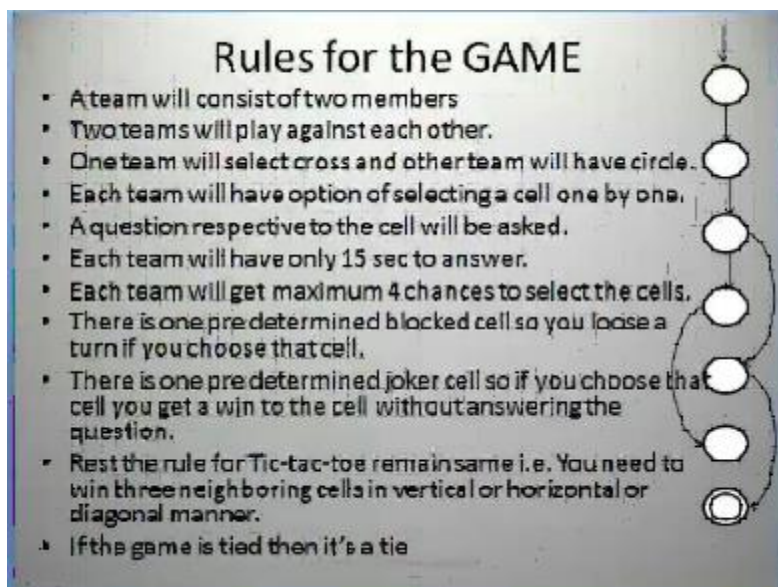
20IT501 Theory of Computation-Tic-Tac-Toe game

Preamble:

The objective was to enable students to revise the basic concepts of Theory of Computation such as FA, NFA, DFA, their properties and limitations. Students were free to choose the partner to play the classic Tic-Tac-Toe game.

Description: Students were supposed to play the game in a team of two members. A team member will select the cell number. There was a predefined question for that cell. Answering correctly within 15 sec will win that cell. This way they need to complete the Tic-Tac-Toe to win. Three sets of Tic-tac-toe game were played.

Rule for the Game

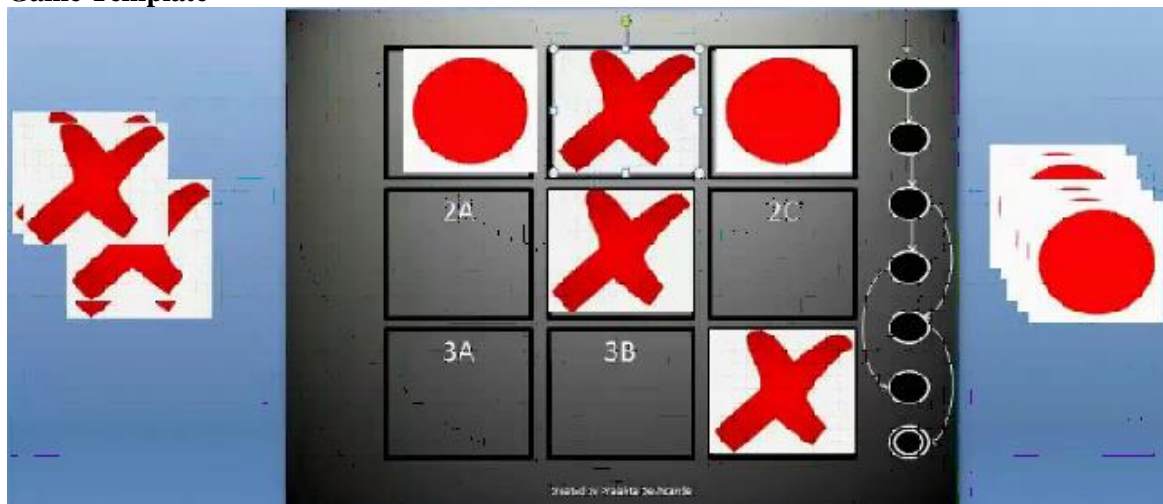


Rules for the GAME

- A team will consist of two members
- Two teams will play against each other.
- One team will select cross and other team will have circle.
- Each team will have option of selecting a cell one by one.
- A question respective to the cell will be asked.
- Each team will have only 15 sec to answer.
- Each team will get maximum 4 chances to select the cells.
- There is one pre-determined blocked cell so you lose a turn if you choose that cell.
- There is one pre-determined joker cell so if you choose that cell you get a win to the cell without answering the question.
- Rest the rule for Tic-tac-toe remains same i.e. You need to win three neighboring cells in vertical or horizontal or diagonal manner.
- If the game is tied then it's a tie

The slide also features a vertical column of seven circles on the right side, with a dashed line connecting the bottom four circles.

Game Template



The Game Template slide shows a 3x3 Tic-Tac-Toe grid on a black background. The grid contains red circles and red crosses. To the right of the grid is a vertical column of seven circles, with a dashed line connecting the bottom four circles. On the left and right sides of the grid are stacks of cards with red crosses and red circles respectively. The grid cells are labeled as follows:

Red Circle	Red Cross	Red Circle
2A	Red Cross	2C
3A	3B	Red Cross

At the bottom center, there is a small text: "Created by Prashant Dehencar" and a small logo.

Sample Questions Asked

Game 1

1A) Number of states required to accept string ending with '10' are: Ans: 3

1B) Transition function for NFA is given by: Ans: $Q \times \Sigma \rightarrow Q$

1C) Language of Finite Automata is always: Ans: Formal Language

2A) What is the difference between a string and a valid word for a language? : Ans: String is any combination of Σ where as valid word is that combination that reaches final state of FA

2B) What is a Null string? Ans: A string with no alphabet.

2C) **Joker cell**

3A) For a language if $\Sigma = \{a,b\}$ then will 'ab' a valid alphabet for the same language? Ans: No it will be a word generated from Σ

3B) **Blocked cell**

3C) What is the difference between NFA and DFA?

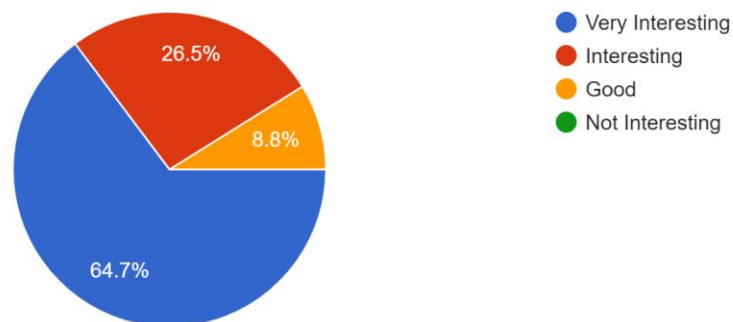
Ans: NFA can have many transition on a given state on a given input symbol

DFA has a unique transition to a state on unique input symbols.

Feedback

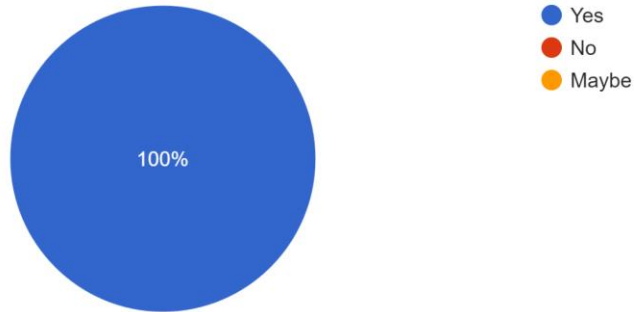
How do you like the Idea of playing a game

34 responses



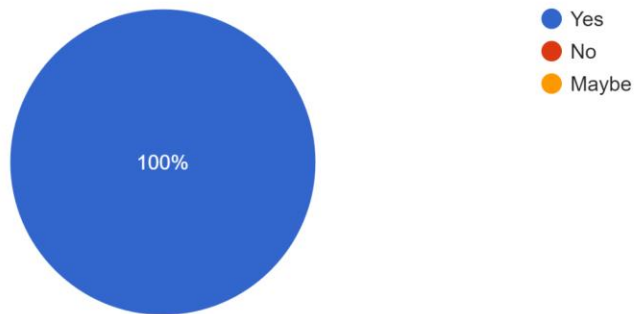
Did you learn the abstract computing models

34 responses



Would you like to play more games like this

34 responses



Impact:

- Students could relate to the basics of Theory of Computation
- They could think innovatively to apply their learned concepts for Theory of Computation.

No. of students benefited: 78 students of 2024-25 TY batch