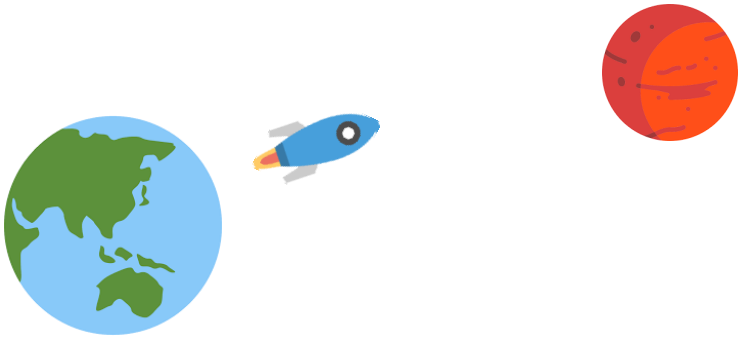
AUTOMAT Machine Project Specifications

(Max of 3 people per group) The project consists of a program solving the problem as well as the documentation. Consider the following puzzle:



The Earth is slowly dying and a scientist wants to help build a new life on Mars. However, he only has a spaceship that was so tiny it could only carry him and two other items. He wants to transport five things that he thought were essential to start a new life on Mars: two humans, one lion, one cow and one bag of grain. Whenever the scientist is not around, either human would kill the lion out of fear or eat the cow out of hunger, the lion will eat the cow, and the cow will eat the grain. Only the scientist knows how to fly the spaceship. How will the scientist transport all the five items to Mars?

Requirements:

Main Goal: Design a finite automaton for the puzzle and write a program to find and print the solution to the problem with the minimum number of moves.

1. Create a UI that allows the user to simulate the scenario of transporting items from Earth to Mars. Display your finite automaton on the screen and for each move made by the player, it should highlight the state that the player is currently in.
2. You should notify the player if he has violated any rules thus ending the game. Notify the player as well if their solution is accepted.
3. Allow the user to ask for instructions for the solution to the problem.
4. The steps for the solution should be given such that it will be easily understandable if the player were to follow said instructions.
5. Highlight the states in your automaton that will be visited for the solution (it is possible to have more than one solution with the minimum number of moves, so be sure that you can display all those solutions individually)
6. The documentation should include the problem that was solved, examples, design choices of the implementation (ex. what structures did you use) and details about your solution including the complete definition of your automaton, description of your inputs, transitions and final states. Use the ACM format when writing your paper
7. You can use any programming language and the graphics is not that important. You can use ASCII art if you want to.