CONSILIUM

PROBLEM STATEMENT (ROUND 2)

"HELP THE LIMBDI WALE BHAIYA"

A Warm welcome to all the participants from **Team Consilium**!

In Round 1, the student successfully designed the Finite state machines of the three products separately, now he goes to the shopkeeper and shows him the work done so far but the shopkeeper is unable to understand. He again asks for your help in making the shopkeeper understand the design and its working. You know Proteus Software, and using displays, the shopkeeper can easily understand the working of the BLACK BOX. So, Can you help your friend designing the BLACK BOX in the proteus software?

Problem Description:

1. The input money is only one currency note at a duration which is either 10 or 20 or 50 rupees.

2. When the total money inserted crosses the Maximum Retail Price(MRP) the product is dispensed and the change is given back to the customer.
3. When the total money inserted is less than the MRP and there is no input money in the next duration the product is not dispensed and the money inserted till the previous duration will be returned to the customer.
4. The products available in the BLACK BOX are Chola samosa, cold-drink and sandwich and their cost is 30,40 and 50 rupees respectively.
5. The BLACK BOX can give any amount of change at any time.

Explanation:

For the customer to buy the cold-drink, the process can go this way: (This is one possible way and not the only way)

1. Initially, the BLACK BOX waits for the input and takes the input after every duration.
2. The customer selects the product he wants to buy i.e. cold drink and then inserts the notes in the fashion of 10 rupee notes, 20 rupee notes, and then 50 rupee notes.
3. Now the BLACK BOX dispenses the cold-drink and the change of 40 rupees as two 20 rupee notes or four 10 rupee notes etc.

Task for round 2:

Design the circuit for the above BLACK BOX in Proteus.

- The inputs to the BLACK BOX are as follows:

1. input(s) for selecting an item and
2. input(s) for inserted money (two bits)

- The output of the BLACK BOX is as follows:

a) whether the purchase is successful or not and

b) the change (up to three bits).

- Use a logic probe showing whether the purchase is successful or not (0 or 1).
- Use only D Flip Flop.
- **Use the 7 segment display (7SEG-BCD IC in proteus) to represent change in the circuit.**
- Keep the clock frequency low (0.5 Hz) at the time of final submission to have a better understanding of the working of the design.
- Make the circuit clear and understandable (you can label the name of the integrated circuits for easy understanding)

General Rules:

1. All the participants caught in the plagiarism are disqualified immediately without any hesitation.
2. One participant can be present in only one team otherwise the participant and the teams in which she/he is present will be disqualified.
3. The submissions will be accepted till 11:59 PM, 21-03-2021.
4. Any change in the rules, timings, marking scheme, etc will be notified.

5. The organizers reserve the right to change the rules.
6. All the decisions taken by the organizers will be final and binding.

Submissions:

1. Along with the design file (.dsn) , you have to submit a short video explaining working of the circuit .
2. Any one member of the team should only send the submission.
3. The file name should be in the following format :

   Eg: If a participant or member of team is Ramesh Kumar with roll number 18085020 studying in electrical department submitting for the round-2 then the file should be named **18085020-R2-Ramesh_kumar-electrical**
4. The teams are required to submit their solutions through the google form-

   https://docs.google.com/forms/d/1r3BffDdl7BWE4AJgPHWexek_jz1qIbe0BOMtZV_Jx8w/edit?usp=sharing