

BRAINWAVE '17 – DIP

The Sherlock's Distress

Moriarty is dead. But unresolved quests and perplexing mysteries aren't. Before breathing his last breath, Moriarty left a myriad of unsettled secrets for Detective Holmes to decipher. Following the clues and further decoding them has never been an easier job, even for the man who claims his existence to be defined only by his brain. These mysteries have therefore led to an unfortunate situation, where Sherlock's brother Mycroft and partner Dr. Watson are held hostages and tied to a deadly bomb. The defusing mechanism is divided into two rounds, which makes use of parts of the bomb's circuit. Since, Sherlock no more retains the knowledge of circuitry and therefore, he is unable to deduce anything and looks for help.

Your task is to use your knowledge to help Mr. Holmes to solve the circuit. But, wait! Not so easily! The circuit, being a complex one cannot be touched or interfered with. The only manner to solve the circuit is to use its image and process it for the desired information.

In order to save the lives of Mycroft and Dr. Watson, help the greatest detective of the era to complete the following tasks.

Task

You are required to design a system that takes an image of a circuit and the associated voltages and current values as the input and determine the **circuit elements and solve the circuit for the given voltage and current values.**

The task is divided into three rounds.

1. **Round 1:** Determination of the circuit elements.
2. **Round 2:** Determining the structure of the circuit and to solve the same for given values of input voltages and/or current.

The details of the two rounds are as follows:

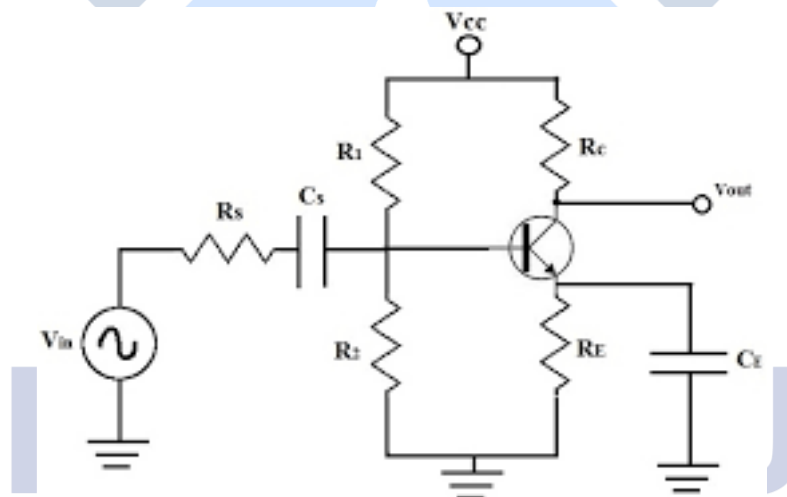
For round 1:-

In this round, all the circuitual elements (Capacitors, Inductors, Resistors, Transistors etc.) have to be identified. The processed image, which correctly detects the components of the circuit at their positions in the image, is to be submitted as the output.

For round 2:-

In this round, the participants will be provided with input current and/or voltages. They are required to solve the circuit, by applying image processing techniques and submit the output voltage or current (as specified in the question).

The image will be provided on the spot and will be similar to the one given below.



Marking Scheme

The marking will depend on the working, accuracy, concepts used and the robustness of the system. The detail of marks to be awarded in each round is given below.

1. 30 points will be awarded for the synopsis which will include algorithms and main features of your implementation.
2. For Round 1: 80 points will be awarded for successfully detecting the circuit elements
3. For Round 2: 80 points will be given for successful submission of output parameters.

Judgment Criteria

The teams will be judged on the following points:-

1. Accuracy of the logic implemented.
2. Finesse in coding and optimization.

General Rules

1. Each team can have a maximum of three participants. Students from different colleges can be a part of the same team.
2. Judges decision will be final and binding.
3. Participants should bring their own laptops.
4. If any other material is required, the participants may ask for the same through e-mail or phone at least 10 days prior to the competition.

Competition Structure

Stage 1-

Each Team has to mail a soft copy of the synopsis of their model to **brainwave.troika@dcetech.com** by **30 January 2016**. It should include the algorithm and main features of your implementation.

Stage 2-

Teams selected in the first stage will appear on the competition day with their fully working model for the final show down. The teams will be rated as per marking criteria and judge's discretion.

Please regularly check the website for further updates on the competition and the change in rules and regulations, if any.

All the Best!

#Happy Troika ☺