1. Please design a card memory game in Scratch. A reference for the same could be found [here (12 card version)](https://www.helpfulgames.com/subjects/brain-training/memory.html). Please submit a link to your project.
   1. Link for the project -
      1. <https://drive.google.com/file/d/1JXkGLyL6wcLB3dBGrHvDXuN5AZq4j8oA/view?usp=sharing>
2. We need to develop a project which combines math with tech. The math topic is mensuration (grade 8). What would be the tech that you would recommend? Please describe the project statement that combines the concepts of mensuration (and not just one) with tech to build a product (app/simulation/demo) that finds use on a day to day basis.
   1. Design and Develop a Cloth Measurement Tool using Arduino, Ultrasonic Sensor and Craft Material.
   2. Also prove that the speed of the sound in 340m/s
   3. This cloth measurement tool will be used in any cloth shop and will replace the traditional scale based measurement system which adds human error in the process
   4. This will be an excellent way to work with ultrasonic sensors also.
3. There is an app for calculating the value of a shopping cart. When we add 1 item, the total shows up fine. The minute we add any other item (or even one more of the same item), the total has an error. When discounts need to be calculated, the errors are different. Please list all the possible places you would expect the code to be written incorrectly. What are the common mistakes you might expect? Be specific and share your assumptions, if any.
   1. Case 1 - One more item is added to the cart
      1. Assumption - Unit cost is not an integer but a decimal value and it is defined as float in the program
      2. Output might be declared as integer and hence the loss of digits after decimal places
   2. Case 2 - When discounts are applied the errors are different.
      1. Assumption - Different items have different discounts.
      2. ‘If’ condition must have been used to offer different discounts for different items, there must have been an error in defining a condition.
   3. Case 3 - Multiple items are added to the cart
      1. If the total\_count is a variable whose value is returned by the function which calculates the total then
   4. Case 4 -
      1. If GST is applied, then probably it might happen that GST is not getting calculated on discounted price but on original price.
   5. Case 5 - Previous cart
4. We need to develop a project which combines math with tech. The math topic is probability. What would be the tech that you would recommend? Please describe the project statement that combines the concepts of probability (and not just one) with tech to build a product (app/simulation/demo) that finds use on a day to day basis.
   1. Using Titanic Survival Dataset, Python Programming Language and Python Libraries for Data Science such as **Pandas, Seaborn**.
   2. Let us find out **what kind of passengers are more likely to survive**.
   3. Using Jupyter Notebook, various plots can be plotted to find out the relationship between survival of the passenger and different features of the dataset.
   4. This way students will be able to understand the process of **Data Analysis**
5. If you were to prepare coding guidelines for Scratch project development, list the key categories of the guidelines. What, according to you, would be the top 10 guidelines that every single developer must follow?
   1. Three main categories
      1. Theme of the project
      2. The look and feel of the Scratch Project - The UI and UX
      3. The Computational Thinking of the Project - The Logic
   2. Based on these categories following are the top 10 guidelines -
      1. As a Scratch Developer, one must **Begin with the END.** 
         1. A problem statement with less ambiguity helps reduce the development time
         2. Write down the problem statement
      2. Once the problem statement is written, then visualize the final outcome of the problem statement.
         1. If it is a game, then what type of game or if it is a simulation how it will be displayed etc.
      3. Visually written problem statement breaks into three phases -
         1. Input
         2. Processing
         3. Output
      4. Once the developer is clear with input, then assets and sounds can be created/uploaded to the project as well as the environment can be designed.
      5. Define a color scheme, apply CRAP (Contrast, Repetition, Alignment, and Proximity) Principles to design the better look and feel.
      6. If there are variables, instead of writing the names of the variables as a, b, c or some random name, keep the name relevant to the project and the action it is going to perform.