Ideation Phase
Brainstorm & Idea Prioritization Template

Date	31-10-2023
Team ID	Team - 592384
Project Name	Deep learning model for detecting diseases in tea leaves
Maximum Marks	4 Marks

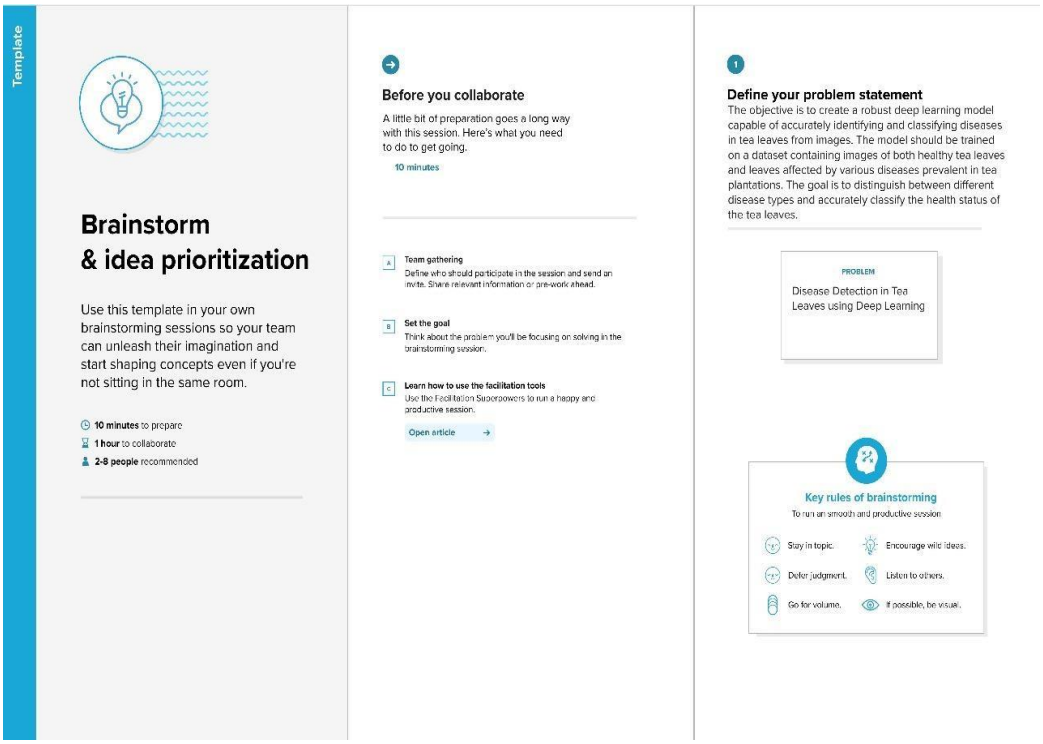
Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich number of creative solutions.

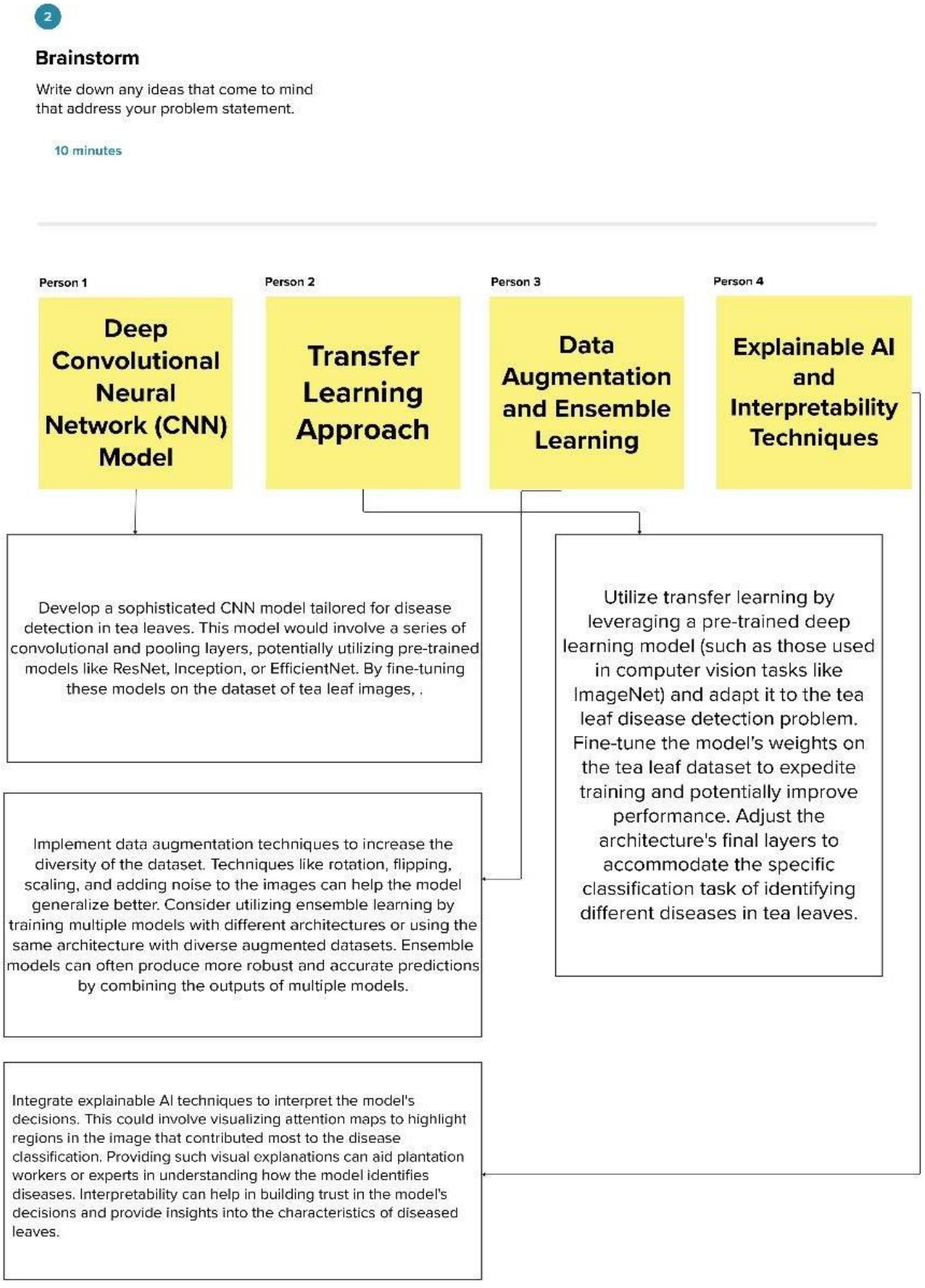
Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

Reference: https://www.mural.co/templates/empathy-map-canvas

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



3

Group ideas

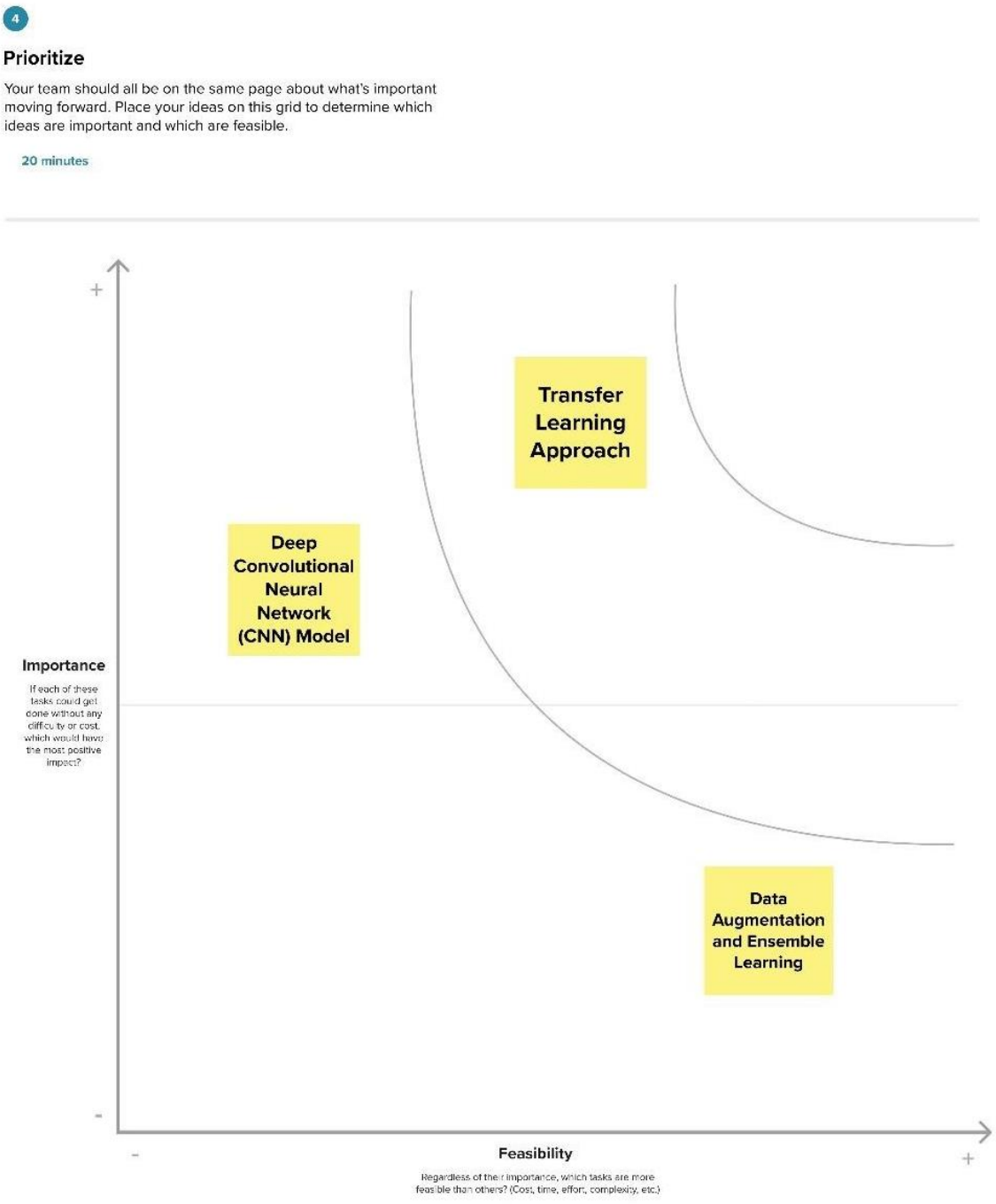
Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

Integrated Deep Learning Framework for Tea Leaf Disease Detection

1. **Integrated Transfer Learning with Explainable CNN Model:**
   - **Base Pre-trained Model Selection:** Begin by selecting a pre-trained deep learning model known for image classification, such as ResNet or EfficientNet. These models have demonstrated strong performance on similar tasks.
   - **Fine-tuning and Adaptation:** Modify the pre-trained model's architecture by retraining its final layers to suit the specific problem of tea leaf disease detection. This process involves transfer learning, where the model learns tea leaf disease features while retaining the knowledge obtained from pre-training on generic image datasets.
2. **Data Augmentation and Ensemble Techniques:**
   - **Diverse Data Augmentation:** Augment the tea leaf dataset with various transformations like rotation, flipping, scaling, and adding noise. This augmented data enriches the training set, aiding the model's ability to generalize.
   - **Ensemble Learning:** Train multiple instances of the adapted pre-trained model on different subsets of the augmented dataset. The models can have variations in architectures or be trained on different augmented data. Ensemble models aggregate the predictions from multiple models for improved accuracy and robustness.
3. **Interpretability and Explainability Integration:**
   - **Attention and Interpretability:** Implement techniques to visualize the model's decision-making process. Integrate attention maps or saliency techniques to highlight regions in tea leaf images that contribute most to disease classification. This enables easy interpretation for plantation workers or experts, enhancing trust in the model's decisions.
4. **Continuous Improvement and Iterative Development:**
   - **Performance Monitoring:** Continuously evaluate the model's performance on validation and test datasets. Monitor accuracy, precision, recall, and interpretability metrics.
   - **Iterative Refinement:** Based on performance evaluations, iterate on the model architecture, data augmentation strategies, and interpretability methods to enhance accuracy and usability.

Step-3: Idea Prioritization



Reference View:

https://app.mural.co/t/collegeexternshipvitchennai0761/m/collegeexternshipvitchennai0761/1698673951680/baf932823e15793ee3cb20206fc59c9001929886?sender=u29877237bd19aca1159c6412