**Project Topic: Comparative Analysis of CNN and Transformer Architectures for Image Classification**

**Project Team:**  
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**Project Overview:**

This project aims to conduct a comparative analysis of Convolutional Neural Networks (CNNs) and Transformer architectures for image classification. We will collaborate to build, train, and evaluate two different deep learning models, one based on a CNN and the other based on a Transformer, using the same dataset. Goal of this project is to learn and understand the two architectures and how both are different from each other, and when can we consider using it.

**Project Plan and Timeline:**

1. Week 1: Dataset selection and Dataset Preparation
   * Define the project scope and objectives.
   * Select the dataset for image classification.
   * Preprocess and split the dataset into training and testing sets.
2. Week 1-2: Model Building
   * Build and train a CNN-based image classification model.
   * Build and train a Transformer-based image classification model (e.g., Vision Transformer - ViT).
3. Week 3: Training and Evaluation
   * Train both models on the same training dataset with the same hyperparameters.
   * Evaluate the performance of the CNN and Transformer models on the testing dataset.
4. Week 4: Comparative Analysis
   * Compare the performance of the CNN and Transformer models.
   * Analyze differences in training dynamics, convergence speed, and generalization capabilities.
5. Week 5: Visualization and Reporting
   * Create visualizations, such as confusion matrices and accuracy plots.
   * Document the findings and insights in a report or a Jupyter notebook.
6. Week 6: Final Report and Presentation
   * Compile the project findings into a comprehensive report.
   * Prepare a presentation to share the project's results and insights.

**Roles and Responsibilities:**

* Project planning, collaboration.
* Build and train the CNN model, conduct model evaluation, and contribute to the comparative analysis.
* Build and train the Transformer model, conduct model evaluation, and contribute to the comparative analysis.

**Communication and Collaboration:**

* Weekly team meetings to discuss progress and challenges.
* Collaborate on code development and share results and insights regularly.
* Maintain clear and organized documentation throughout the project.

**Deliverables:**

* Trained CNN and Transformer models.
* Comparative analysis report.
* Visualizations and plots.
* Project presentation.