**Summary of the Chosen Model and Training Process**

**MODEL SUMMARY:**

A Convolutional Neural Network (CNN) is a type of neural network architecture designed for image recognition and processing. It was chosen to classify the images. CNNs are particularly effective in tasks where the spatial arrangement of features is important, making them well-suited for tasks like image classification, object detection, and image segmentation. They are effective at extracting features from data using multiple layers.

**CNNs have three main components:**

Convolution Layers:

* Extract features from the input data.
* Employ filters or kernels to identify distinct patterns within the image.
* Slide the filter across the image computing dot products to create a feature map.

Activation Functions:

* Introduce non-linearity into the model.
* Common activation functions include ReLU (Rectified Linear Unit) and sigmoid.

Pooling Layers:

* Reduce the number of parameters in the input data.
* There are two main types: max pooling and average pooling.

**Training Process:**

1. Image Processing:

* Load and convert images to RGB color space.
* Standardize the size of images.
* Convert images into NumPy arrays.

1. Model Architecture:

* Sequential CNN model with multiple layers:
* Convolutional layer with 32 filters, 3x3 kernel, and ReLU activation.
* Max-pooling layer with 2x2 pool size.
* Flatten layer to transform 2D feature map into 1D vector.
* Dense layer with 256 units and ReLU activation.
* Dropout layer to prevent overfitting.
* Dense layer with 512 units and ReLU activation.
* Output layer with 5 units and softmax activation for multi-class classification.

1. Model Compilation:

* Compile the model using Adam optimizer, sparse categorical cross-entropy loss, and accuracy metric.

1. Model Training:

* Split the dataset into training (70%) and testing (30%) sets.
* Normalize both training and testing data.
* Train the model over 200 epochs with a validation split of 0.1.

**Insights:**

* The model achieved a notable 84% accuracy on the test set.
* The model's effectiveness could be constrained due to the modest size of the dataset, comprising only 150 images.
* Improving performance could entail expanding and diversifying the training dataset, as well as experimenting with different regularization methods.