# **Creation and Testing of a CNN**

The objective of this document is to create a CNN. I started with a very basic CNN that determines whether an image depicts a dog or a cat.

1. **Project Decision**

* Objective: create a CNN (Convolutional Neural Network) capable of recognizing images of dogs and cats.
* Define the main steps: data preparation, model creation, training, saving, and testing.

1. **Installing Python 3.11**
   * Chose Python 3.11 to ensure compatibility with TensorFlow and other necessary libraries.
2. **Creating a virtual environment with Python 3.11**

* Command:
  + py -3.11 -m venv tf\_env
* Used to isolate the project and its dependencies.
* Activation:
  + Windows: tf\_env\Scripts\activate
  + Linux/macOS: source tf\_env/bin/activate

1. **Data Preparation**
   * Collect images of dogs vs cats.
   * Resize, normalize, and optionally split into training/test datasets.
2. **Creating the Python program to generate the model (.h5)**

* Define the CNN architecture (convolutional layers, pooling, fully connected layers, etc.).
* Compile the model (optimizer, loss function, metrics).
* Train the model on the prepared images.
* Save the trained model to a .h5 file.

1. **Running the program to create the model (.h5)**
   * Launch the Python script:
   * python my\_cnn\_script.py
   * Result: a .h5 file containing the trained model.
2. **Creating the program to test the AI**
   * Script to load the .h5 model and test new images.
   * Steps:  
     a. Load the model: tf.keras.models.load\_model("my\_model.h5")  
     b. Prepare the test image.
     + Make a prediction: model.predict(test\_image)
     + Display the result (dog or cat).
3. **Running the AI testing program**
   * Run the test script and check if the model correctly recognizes the images.
   * Optionally adjust the architecture or parameters if the accuracy is not satisfactory.