Implementing a Convolutional Neural Network (CNN) in Python typically involves using a deep learning library, such as TensorFlow or PyTorch.

Below, is a simple example using TensorFlow and Keras, a high-level neural networks API that runs on top of TensorFlow.

1. Install TensorFlow:

Bash

```bash
pip install tensorflow
```

2. Import necessary libraries:

Python

```python
import tensorflow as tf
from tensorflow.keras import layers, models
```

3. Example: Building a Simple CNN for Image Classification:

Python

```python
# Define the CNN model
def create_cnn_model(input_shape, num_classes):
    model = models.Sequential()

    # Convolutional layers
    model.add(layers.Conv2D(32, (3, 3), activation='relu',
input_shape=input_shape))
```

```
    model.add(layers.MaxPooling2D((2, 2)))
    model.add(layers.Conv2D(64, (3, 3), activation='relu'))
    model.add(layers.MaxPooling2D((2, 2)))
    model.add(layers.Conv2D(64, (3, 3), activation='relu'))

    # Dense (fully connected) layers
    model.add(layers.Flatten())
    model.add(layers.Dense(64, activation='relu'))
    model.add(layers.Dense(num_classes, activation='softmax'))

    return model

# Specify input shape and number of classes
input_shape = (28, 28, 1)  # Example: 28x28 grayscale images
num_classes = 10  # Example: 10 classes for digit recognition

# Create the CNN model
model = create_cnn_model(input_shape, num_classes)

# Display the model summary
model.summary()
```

This example creates a simple CNN with three convolutional layers followed by max-pooling layers and two fully connected layers.

The model is designed for image classification tasks.

You’ll need to adapt the input shape and the number of classes based on your specific task and dataset.

4. Training the Model:

After creating the model, you’ll need to compile it and train it on your dataset.

Here’s a brief example using the MNIST dataset:

Python

```
# Compile the model
model.compile(optimizer='adam',
              loss='sparse_categorical_crossentropy',
              metrics=['accuracy'])

# Load and preprocess the MNIST dataset
(train_images, train_labels), (test_images, test_labels) =
tf.keras.datasets.mnist.load_data()
train_images = train_images.reshape((60000, 28, 28,
1)).astype('float32') / 255
test_images = test_images.reshape((10000, 28, 28,
1)).astype('float32') / 255

# Train the model
model.fit(train_images, train_labels, epochs=5,
validation_data=(test_images, test_labels))
```

This example loads the MNIST dataset, preprocesses the images, and trains the CNN model for five epochs. You may need to adjust the dataset loading and preprocessing steps based on your specific dataset.

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