تمرین ضرب العجلی

نام:

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The feature maps in each layer of the CNN model have described differ in their size, number, and level of abstraction. Let's break it down layer by layer:

1. Input Layer:
   * Size: 28x28x1 (padded to 30x30x1)
   * This is the raw input image.
2. First Conv2D Layer:
   * Size: 28x28x32
   * 32 feature maps, each detecting low-level features like edges or simple textures.
3. First MaxPool2D Layer:
   * Size: 14x14x32
   * Same number of feature maps, but spatially reduced.
4. Second Conv2D Layer:
   * Size: 14x14x64 (after padding)
   * 64 feature maps, detecting more complex patterns by combining lower-level features.
5. Second MaxPool2D Layer:
   * Size: 7x7x64
   * Further spatial reduction while maintaining the number of feature maps.
6. Flattened Layer:
   * Size: 3136 (7x7x64)
   * Converts 2D feature maps into a 1D vector.
7. First Dense Layer:
   * Size: 128
   * Fully connected layer processing high-level features.
8. Output Dense Layer:
   * Size: 10
   * Final layer for classification, with each neuron corresponding to a class.

**differences:**

1. Abstraction level: Early layers detect simple features, while deeper layers combine these to recognize more complex patterns.
2. Spatial dimensions: Decrease through the network due to pooling operations.
3. Number of feature maps: Increases in convolutional layers to capture more diverse features.
4. Dimensionality: Transitions from 2D in convolutional layers to 1D in dense layers.

Repository: <https://github.com/morteza-rp/filoger/tree/main/MNISTCNN>