

5.0 PyTorch `nn.Module`

24 August 2025

02:48 AM

☰ Avinash Yadav

The ***torch.nn*** module in PyTorch is a core library that provides a wide array of classes and functions designed to help developers build neural networks efficiently and effectively.

It abstracts the complexity of creating and training neural networks by offering pre-built layers, loss functions, activation functions, and other utilities, enabling you to focus on designing and experimenting with model architectures.

Key Components of ***torch.nn***:



1. Modules (Layers):

- ***nn.Module***: The base class for all neural network modules. Your custom models and layers should subclass this class.
- **Common Layers**: Includes layers like ***nn.Linear*** (fully connected layer), ***nn.Conv2d*** (convolutional layer), ***nn.LSTM*** (recurrent layer), and many others.



2. Activation Functions:

- Functions like ***nn.ReLU***, ***nn.Sigmoid***, and ***nn.Tanh*** introduce non-linearities to the model, allowing it to learn complex patterns.



3. Loss Functions:

- Provides loss functions such as ***nn.CrossEntropyLoss***, ***nn.MSELoss***, and ***nn.NLLoss*** to quantify the difference between the model's predictions and the actual targets.



4. Container Modules:

- ***nn.Sequential***: A sequential container to stack layers in order.



5. Regularization and Dropout:

- Layers like ***nn.Dropout*** and ***nn.BatchNorm2d*** help prevent overfitting and improve the model's ability to generalize to new data.