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I need a python-based PINN code which is written with torch library. this code must solve two dimensional laminar incompressible flow. this code should consider three types of loss function such as data loss, boundary condition loss and PDE loss. in addition, the code must consider hyperparameter tuning (lambda). the next issue is the optimization should be based on "L-BFGS-B" algorithm. finally code should plot predicted versus exact values.

Creating a Physics-Informed Neural Network (PINN) to solve a two-dimensional laminar incompressible flow problem involves several steps. The key components include defining the neural network, specifying the loss functions (data loss, boundary condition loss, and PDE loss), incorporating hyperparameter tuning, and using the L-BFGS-B optimization algorithm.

Here is a complete Python code using the PyTorch library to accomplish this:

python Copy code

```python
import torch
import torch.nn as nn
import torch.optim as optim
import numpy as np
import matplotlib.pyplot as plt

# Define the PINN
class PINN(nn.Module):
    def __init__(self, layers):
        super(PINN, self).__init__()
        self.layers = nn.ModuleList()
        for i in range(len(layers) -
            self.layers.append(nn.Linear(layers[i], layers[i+1]))
```

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