2025 USA-NA-AIO Round 2, Problem 1, Part 7

USAAIO 🛡   **May 2025**

Part 7 (10 points, coding task)

In this part, you are asked to create the dataset $\mathcal{D}_{BC}$.

1. Define dataset $\mathcal{D}_{BC}$ in the way that for each $(t, x) \in \mathcal{D}_{BC}$, x is either 0 or 1, and t is evenly sampled from $\{0, 0.01, 0.02, \cdots, 0.98, 0.99, 1\}$. Therefore, $|\mathcal{D}_{BC}| = 2 \cdot 101 = 202$.

2. The dataset shall be a tensor with name `dataset_train_BC` and shape `(202,2)`.

3. Set `dataset_train_BC.requires_grad = True`.

4. Print `dataset_train_BC.requires_grad` and `dataset_train_IC.shape`.

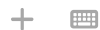**USAAIO** 🛡   **May 2025**

```python
### WRITE YOUR SOLUTION HERE ###

num_samples = 202

data_0 = torch.stack([torch.linspace(0, 1, num_samples//2), torch.zeros(num_sampl
data_1 = torch.stack([torch.linspace(0, 1, num_samples//2), torch.ones(num_sample
dataset_train_BC = torch.cat([data_0, data_1], dim=0)
dataset_train_BC.requires_grad_(True)

print(dataset_train_BC.requires_grad)
print(dataset_train_BC.shape)

""" END OF THIS PART """
```

Skip to main content

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