

2025 USA-NA-AIO Round 2, Problem 1, Part 4

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May 2025

Part 4 (10 points, coding task)

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

1. The dataset object is called `dataset_train_PDE`. It is in a class called `Dataset_PDE` that you need to build.
2. Class `Dataset_PDE` subclasses `Dataset`.
3. Each $(t, x) \in \mathcal{D}_{PDE}$ is randomly sampled from $[0,1]^2$.
4. Set $|\mathcal{D}_{PDE}| = 500$.

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WRITE YOUR SOLUTION HERE

```
num_samples = 500

class Dataset_PDE(Dataset):
    def __init__(self, num_samples):
        self.data = torch.rand(num_samples, 2, requires_grad=True)
```

```
    def __len__(self):
        return self.data.shape[0]
```

```
    def __getitem__(self, idx):
        return self.data[idx]
```

```
dataset_train_PDE = Dataset_PDE(num_samples)
```



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"" END OF THIS PART """

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