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

USAAIO 

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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