山东大学计算机科学与技术学院

大数据分析与实践课程实验报告

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实验题目：机器学习实践		
实验学时：2	实验日期：2025.11.7	
实验目标：对动手实践利用机器学习方法分析大规模数据有进一步了解， 并学习如何利用远程环境进行工程代码的调试.		

一、dataset 代码

```
#MRPCDataset
class MRPCDataset(Dataset):
    def __init__(self, data_dir="/root/autodl-tmp/data6",split="train"):
        self.data_dir = data_dir
        self.split = split
        if self.split == "train":
            self.file_path=f"{data_dir}/msr_paraphrase_train.txt"
        else:
            self.file_path=f"{data_dir}/msr_paraphrase_test.txt"
        self.data=pd.read_csv(
            self.file_path,
            sep="\t",
            header=0,
            encoding="utf-8",
            on_bad_lines="skip"
            )
    def __len__(self):
        return len(self.data)
    def __getitem__(self, idx):
        item=self.data.iloc[idx]
        sen1=str(item['#1 String'])
        sen2=str(item['#2 String'])
        label=int(item['Quality'])
```

```
        return (sen1,sen2),label
def collate_fn(batch):
    sen1_list=[sample[0][0] for sample in batch]
    sen2_list=[sample[0][1] for sample in batch]

    labels=torch.tensor([sample[1] for sample in batch],dtype=torch.float32)
    return (sen1_list,sen2_list),labels
```

二、全连接层代码

```
#全连接层
class FCModel(nn.Module):
    def __init__(self, input_size=768,
hidden1_size=512,hidden2_size=256,output_size=1):
        super(FCModel, self).__init__()
        self.fc1 = nn.Linear(input_size, hidden1_size)
        self.fc2 = nn.Linear(hidden1_size, hidden2_size)
        self.fc3 = nn.Linear(hidden2_size, output_size)
        self.relu = nn.ReLU()
        self.sigmoid = nn.Sigmoid()
    def forward(self, X):
        out = self.fc1(X)
        out = self.relu(out)
        out = self.fc2(out)
        out = self.relu(out)
        out = self.fc3(out)
        out = self.sigmoid(out)
        return out
```

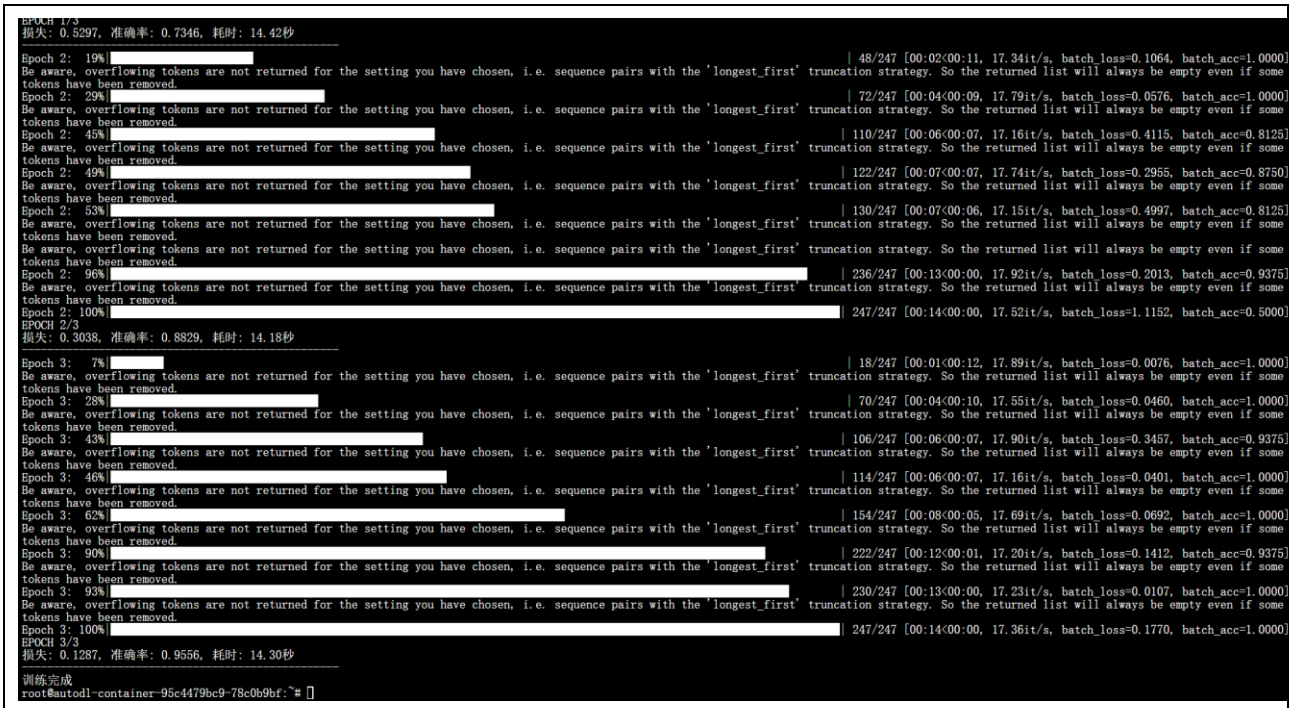
三、数据加载

```
  # 1. 数据加载
    print("正在加载数据集...")
    mrpc_dataset = MRPCDataset()
    train_loader = DataLoader(
        dataset=mrpc_dataset,
        batch_size=16,
        shuffle=True,
        num_workers=4,  # 使用多进程加载数据，加快速度
        collate_fn=collate_fn
    )
```

四、模型加载

```
    # 3. 加载 BERT 模型和分词器
    print("正在加载 BERT 模型...")
    tokenizer = BertTokenizer.from_pretrained("bert-base-uncased")
    bert_model = BertModel.from_pretrained("bert-base-uncased")
    bert_model = bert_model.to(device)
    print("BERT 模型加载完成")
```

五、训练结果


EPOCH 1/3
损失: 0.5297, 准确率: 0.7346, 耗时: 14.42秒
Epoch 2: 19% | 48/247 [00:02<00:11, 17.34it/s, batch_loss=0.1064, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 2: 29% | 72/247 [00:04<00:09, 17.79it/s, batch_loss=0.0576, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 2: 45% | 110/247 [00:06<00:07, 17.16it/s, batch_loss=0.4115, batch_acc=0.8125]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 2: 49% | 122/247 [00:07<00:07, 17.74it/s, batch_loss=0.2955, batch_acc=0.8750]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 2: 53% | 130/247 [00:07<00:06, 17.15it/s, batch_loss=0.4997, batch_acc=0.8125]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
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Epoch 2: 96% | 236/247 [00:13<00:00, 17.92it/s, batch_loss=0.2013, batch_acc=0.9375]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 2: 100% | 247/247 [00:14<00:00, 17.52it/s, batch_loss=1.1152, batch_acc=0.5000]
EPOCH 2/3
损失: 0.3038, 准确率: 0.8829, 耗时: 14.18秒
Epoch 3: 7% | 18/247 [00:01<00:12, 17.89it/s, batch_loss=0.0076, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 28% | 70/247 [00:04<00:10, 17.55it/s, batch_loss=0.0460, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 43% | 106/247 [00:06<00:07, 17.90it/s, batch_loss=0.3457, batch_acc=0.9375]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 46% | 114/247 [00:06<00:07, 17.16it/s, batch_loss=0.0401, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 62% | 154/247 [00:08<00:05, 17.69it/s, batch_loss=0.0692, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 90% | 222/247 [00:12<00:01, 17.20it/s, batch_loss=0.1412, batch_acc=0.9375]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 93% | 230/247 [00:13<00:00, 17.23it/s, batch_loss=0.0107, batch_acc=1.0000]
Be aware, overflowing tokens are not returned for the setting you have chosen, i.e. sequence pairs with the 'longest_first' truncation strategy. So the returned list will always be empty even if some tokens have been removed.
Epoch 3: 100% | 247/247 [00:14<00:00, 17.36it/s, batch_loss=0.1770, batch_acc=1.0000]
EPOCH 3/3
损失: 0.1287, 准确率: 0.9556, 耗时: 14.30秒
训练完成
root@autodl-container-95c4479bc9-78c0b9bf:~#