Prompt:
#Active Accuracy can no longer be based on label != -100, we use attention_mask # No need to fix anything here. def new_valid(model, testing_loader): # put model in evaluation mode model.eval()
Answer:
The KeyError: -100 error typically occurs because -100 is often used as a placeholder in PyTorch for tokens that should be ignored, like padding tokens. When trying to convert IDs back to labels using ids_to_labels, the code encounters -100 and raises a KeyError since ids_to_labels doesn't have an entry for -100. # Convert predictions and labels to text labels, ignoring -100 entries labels = [[ids_to_labels[id.item()] for id in label_seq if id.item() != -100] for label_seq in eval_labels] predictions = [[ids_to_labels[id.item()] for id in pred_seq if id.item() != -100] for pred_seq in eval_preds] 但是不允许修改 new_valid
Prompt: RuntimeError Traceback (most recent call last) in () 74 75 # Assuming ids_to_labels and training_loader, testing_loader are defined -- -> 76 model = BertCRFModel(num_labels=len(ids_to_labels)).to(device) 77 model = crf_train(model, training_loader) 78 5 frames /usr/local/lib/python3.10/distpackages/torch/nn/modules/module.py in convert(t) 1324 memory_format=convert_to_format, 1325) -> 1326 return t.to(1327 device, 1328 dtype if t.is_floating_point() or t.is_complex() else None
Answer：
The "CUDA error: device-side assert triggered" error usually indicates an issue that may occur due to the following reasons, especially when involving a CRF layer:
Possible Causes and Solutions:

1. **Label Mismatch or Value Out of Bounds**:
    - The CRF expects the labels to be between 0 and num_labels - 1. If your labels contain negative values or values larger than num_labels - 1, this error will occur.
    - Double-check your labels_to_ids mapping and ensure that all your label IDs are valid. You can add a validation check like this before proceeding:

python
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for label in labels_to_ids.values():
    assert label >= 0 and label < num_labels, "Invalid label value detected"

2. **CRF Layer Initialization on GPU**:
    - It is possible that the CRF layer initialization is triggering this issue when being moved to the GPU. Instead of moving crf_model separately to the device, try to move the entire combined model, as follows:

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crf_model = CRF(num_labels, batch_first=True)
combined_model = BertCRFModel(model, crf_model).to(device)

3. **Incompatible Input Dimensions**:
    - Check if the emissions tensor (logits) passed to the CRF has the correct dimensions.

- The CRF expects emissions to have shape (batch_size, sequence_length, num_labels). To ensure that this is correct, you can add debug print statements:

python
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print("Logits shape:", logits.shape)
assert logits.size(-1) == num_labels, "The number of logits does not match the number of labels"

- Make sure that your attention_mask and labels also have the correct dimensions matching your logits.

4. **Enable CUDA_LAUNCH_BLOCKING**:
   - Setting CUDA_LAUNCH_BLOCKING=1 can help identify where the CUDA error occurs. You can add this at the start of your code:

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import os
os.environ["CUDA_LAUNCH_BLOCKING"] = "1"

- This will make CUDA operations synchronous, helping to provide more accurate stack traces.

Suggested Changes:

1. **Combined Model Initialization**:
   - Instead of moving the CRF model separately to the GPU, ensure that only the combined model is moved to the device:

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# Create CRF model
num_labels = len(labels_to_ids)
crf_model = CRF(num_labels, batch_first=True) # Do not move to device here

# Combine BERT and CRF into a single model
combined_model = BertCRFModel(model, crf_model).to(device) # Move entire model to device

2. **Add Debugging Information**:
   - Add some debugging print statements to verify the input shapes:

python
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class BertCRFModel(torch.nn.Module):
    def __init__(self, bert_model, crf_model):
        super(BertCRFModel, self).__init__()
        self.bert = bert_model
        self.crf = crf_model

    def forward(self, input_ids, attention_mask, labels=None):
        outputs = self.bert(input_ids=input_ids, attention_mask=attention_mask)

```
        logits = outputs.logits  # Extract logits

        # Debugging print statements
        print("Logits shape:", logits.shape)
        if labels is not None:
            print("Labels shape:", labels.shape)

        if labels is not None:
            loss = -self.crf(logits, labels, mask=attention_mask.bool())
            return loss
        else:
            return self.crf.decode(logits, mask=attention_mask.bool())
```

3. **Verify Labels Are on the Same Device**:
    - Make sure all inputs and labels are moved to the GPU (device). If they are not on the same device, it can trigger CUDA errors.

If the error still persists, please share the specific line and any output from the debugging print statements so we can further analyze the issue.

Prompt:

------- AttributeError Traceback (most recent call last) <ipython-input-110-2413540bb23c> in <cell line: 17>() 15 # Assuming model, training_loader, and testing_loader are defined and initialized 16 model = BertCRFModel(num_labels=len(ids_to_labels)).to(device) ---> 17 model, crf_model = crf_train(model, model.crf, training_loader) 18 19 # Validate the model <ipython-input-106-a36298aaa60d> in crf_train(model, crf_model, training_loader, epochs, learning_rate) 18 # 前向传播计算 BERT 的输出 19 outputs = model(input_ids=input_ids, attention_mask=attention_mask) ---> 20

Answer:

The error you're encountering indicates that the outputs from your model is being treated as a list rather than an object with a logits attribute. This is likely due to how the forward method of your BertCRFModel is structured.

In your BertCRFModel, you return loss and logits when labels are provided, but if no labels are provided, you return predictions. This discrepancy can cause confusion when accessing the output.

To fix this, modify the crf_train function to correctly handle the output from the model. Here's an updated version:

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```
def crf_train(model, training_loader, epochs=3, learning_rate=2e-5, device='cuda'):
    # Using AdamW optimizer to jointly optimize BERT and CRF parameters
    optimizer = AdamW(model.parameters(), lr=learning_rate)

    model.train()

    for epoch in range(epochs):
        total_loss = 0
```

```
        for batch in training_loader:
            # Load input data onto the device
            input_ids = batch['input_ids'].to(device)
            attention_mask = batch['attention_mask'].to(device)
            labels = batch['labels'].to(device)

            # Forward pass through the model
            loss, logits = model(input_ids=input_ids, attention_mask=attention_mask,
labels=labels)

            # Backward pass and optimization
            optimizer.zero_grad()
            loss.backward()
            optimizer.step()

            # Accumulate loss
            total_loss += loss.item()

        avg_loss = total_loss / len(training_loader)
        print(f"Epoch {epoch + 1}/{epochs}, Loss: {avg_loss:.4f}")

    return model
```

Key Changes:

1. **Correctly Handling Outputs**: Make sure you're accessing the output correctly. In this case, loss, logits are returned properly when labels are passed.
2. **Remove crf_model Parameter**: Since the CRF layer is part of the model, there's no need to pass it separately.

Final Call:

You should now call the training function like this: