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# 2025 USA-NA-AIO Round 2, Problem 3, Part 11

USAAIO 

May 2025

## Part 11 (5 points, coding task)

In this part, you are asked to build your CLIP model.

- The class name is `MyCLIP`. It subclasses `nn.Module`.
- `__init__`:
  - It takes one input argument - the size of the final embedding of text and image data. Set its default value as 512.
  - Attribute `log_tau` is the log of temperature. It is a learnable parameter. Its initial value follows the standard normal distribution.
- `__forward__`:
  - It returns two objects: image embedding, text embedding.

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

```
class MyCLIP(nn.Module):
    def __init__(self, embedding_size = 512):
        super().__init__()
        self.model_image = ViTModel.from_pretrained('google/vit-base-patch16-224')
        self.model_text = BertModel.from_pretrained('bert-base-uncased')
        self.embedding_size = embedding_size
        self.last_layer_image = nn.Linear(768, self.embedding_size)
```

[Skip to main content](#)

```
self.last_layer_text = nn.Linear(768, self.embedding_size)
self.log_tau = nn.Parameter(torch.randn(1))

def encoder_image(self, image_batch):
    image_embedding = self.model_image(image_batch)['last_hidden_state'][:,0]
    image_embedding = self.last_layer_image(image_embedding)
    return image_embedding

def encoder_text(self, token_id_batch, attention_mask_batch):
    text_embedding = self.model_text(input_ids = token_id_batch, attention_mask = attention_mask_batch)
    text_embedding = self.last_layer_text(text_embedding)
    return text_embedding

def forward(self, image_batch, token_id_batch, attention_mask_batch):
    return self.encoder_image(image_batch), self.encoder_text(token_id_batch, attention_mask_batch)

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

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