

## Assignment 15: Build a Topic-Specific Expert Chatbot

### Objective:

Create a specialized chatbot that demonstrates expert-level responses on a topic of your choice. You will modify the provided Transformer-based chatbot code to train it on a dataset related to your selected topic.

### Instructions:

1. **Select a Topic:**  
Choose a subject that interests you (for example, global warming, renewable energy, artificial intelligence in healthcare, etc.).
2. **Generate Your Dataset:**
  - Create a dataset containing at least 20 Q&A pairs related to your chosen topic.
  - Make sure your questions and answers cover various aspects of the subject so that your chatbot can deliver in-depth, specialized responses.
  - Replace the existing `conversation_pairs` variable in the code with your new Q&A pairs.
3. **Adjust the Code Parameters:**
  - **Max Length (`max_len`):**  
Modify the `max_len` parameter in the `encode_sentence` and `create_dataset` functions if your dataset contains longer sentences. This ensures that your data is properly encoded without truncation.
  - **Training Epochs:**  
Adjust the number of epochs in the training loop based on the complexity and size of your dataset. More epochs might be needed for a well-trained model.
4. **Train Your Chatbot:**
  - Run the modified code to train your Transformer-based chatbot on your dataset.
  - Ensure that during training, the chatbot learns to focus on your chosen topic.
5. **Test and Evaluate:**
  - After training, test your chatbot by asking questions that are directly related to your topic.
  - The expected result is that your chatbot will respond with detailed and topic-specific knowledge, as if it were an expert in that field—not just general conversation.

### Submission Guidelines:

1. **Screenshots:**
  - Include screenshots that show your adjusted training parameters (such as the number of epochs, `max_len`, etc.).
  - Provide screenshots of sample outputs demonstrating that your chatbot responds with expert-level knowledge on your chosen topic.
2. **PDF Report:**
  - Compile your screenshots and a brief explanation of your changes (including the training parameter adjustments and expected results) into a single PDF file.

- The PDF should also include a description of your dataset and a sample conversation showcasing your chatbot's expertise.
3. **Code Submission:**
- Submit your modified code via MSteam.