Conda Environment Setup

This guide helps you to set up the conda environment that will be used for the exercises. If not done so already, please download the `requirements.txt` file in a meaningful location.
If you are new to conda, these resources may be helpful:

Getting Started With Conda
Conda Cheat Sheet

Install Conda

If you don't already have conda installed:

1. Download Miniconda or Anaconda
2. Follow the instillation instructions (here) for your operating system.

Set up the environment

Open your terminal (Command Prompt or Anaconda Prompt on Windows) and run:

```
conda create -n llmcourse python=3.9
```

This creates a new environment named "llmcourse" with Python 3.9.

Activate your environment

Activate the newly created environment:

```
conda activate llmcourse
```

Install required packages

Install the packages from the provided requirements.txt file:

```
pip install -r requirements.txt
```

The `requirements.txt` file contains all necessary packages for the first exercise. We may need to install additional packages later in the course.

Verify Installation

Run a quick check to ensure everything installed correctly:

```
python -c "import torch; import transformers; print(f'PyTorch: {torch.__version__}, Transformers: {transformers.__version__}')"
```

You should see the versions of PyTorch and Transformers printed without errors.

Working with Jupyter Notebooks

1. **Install Jupyter (if needed):** If Jupyter is not included in your environment, install it there:
   `pip install notebook jupyter`

2. **Launch Jupyter Notebook:** With your conda environment activated, start Jupyter:
   `jupyter notebook`
   This will open Jupyter in your default web browser.
3. **Open an existing notebook or create a new one:** Download the first exercise notebook (.ipynb) from the moodle course, and move it into your working directory. Click on the existing notebook, or click "New"→"Python 3" to create a new one.
4. **Select your conda environment as the kernel:** Once your notebook is open:
   1. Click on "Kernel" in the top menu
   2. Select "Change Kernel"
   3. Choose "Python [conda env]" from the dropdown menu.

      If you don't see your environment listed: Close Jupyter Notebook, and run the following command to ensure your environment is registered with Jupyter: `python -m ipykernel install --user --name=llmcourse`

      Then restart jupyter notebook and try again.

Using IDEs for Notebooks

You can also **open Jupyter notebooks directly in modern IDEs like VS Code**. Most popular IDEs offer excellent Jupyter notebook support with integrated cell execution, inline visualizations, and direct conda environment selection. After installing the relevant extensions (such as the Python and Jupyter extensions for VS Code), you can open .ipynb files directly in your IDE and select your "llmcourse" environment as the kernel.

Troubleshooting

- **CUDA Issues**: If you have a compatible NVIDIA GPU and want to use it
  `python -c "import torch; print(f'CUDA available: {torch.cuda.is_available()}')"`
- If this returns False but you have a compatible GPU, you may need to install the CUDA toolkit separately (not necessary for the exercises).
- **Package Conflicts**: If you encounter conflicts while installing requirements, try creating a fresh environment with:
  ```
  conda create -n llmcourse-new python=3.10 --no-default-packages
  conda activate llmcourse-new
  pip install -r requirements.txt
  ```
- **Memory Issues**: Some models require significant RAM/VRAM. If you experience out-of-memory errors during exercises, try using smaller models or enabling CPU offloading where applicable.

Additional Notes

- Keep your environment activated whenever working on course materials with `conda activate llmcourse`
- To deactivate your environment when finished, use `conda deactivate`
- If instructed to install additional packages later in the course, use `pip install [package-name]` or update your `requirements.txt` and run `pip install -r requirements.txt` again
- For any environment setup issues, please post in the moodle forum or contact the teaching assistants.