✅ Full Dependency List for MIRA

🔷 1. Basic Core Libraries

These are standard for running most Transformer-based models and LLaMA locally:

bash
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```
pip install torch transformers llama-cpp-python
```

✅ These are the most important libraries:

- `torch`: For running the RoBERTa model

- `transformers`: From HuggingFace, loads and runs RoBERTa

- `llama-cpp-python`: Lightweight wrapper to run quantized `.gguf` LLaMA models locally using CPU/GPU

🔷 2. Exact Version Lock (Recommended for Reproducibility)

bash
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```
pip install torch==2.0.1
pip install transformers==4.30.2
pip install llama-cpp-python==0.1.72
```

🔷 3. Optional (but recommended) Add-ons

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```
pip install accelerate
pip install sentencepiece  # sometimes needed for tokenizer
compatibility
pip install numpy
```

- `accelerate`: Helps with device placement, e.g., GPU/CPU auto-switching

- `sentencepiece`: May be required depending on tokenizer format

- `numpy`: Useful in various model pipelines

🔷 4. For GPU support (CUDA) — PyTorch Only

Visit PyTorch Install Page and use their selector.

Or for CUDA 11.8, run this:

bash
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```
pip install torch torchvision torchaudio --index-url
https://download.pytorch.org/whl/cu118
```

✅ Your GPU must support at least CUDA 11.8 and have up-to-date NVIDIA drivers.

🔷 5. LLaMA System Dependencies (Windows)

For `llama-cpp-python`, ensure:

- You have **CMake** installed (`cmake --version`)

- You have **Visual Studio Build Tools** installed (for C++ toolchain)

  - Specifically: `MSVC v142` or newer with C++ CMake tools

If using WSL or Linux, install:

bash
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```
sudo apt install build-essential cmake
```

📦 Everything in One Install Command (CPU only)
bash
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```
pip install torch==2.0.1 transformers==4.30.2
llama-cpp-python==0.1.72 accelerate sentencepiece numpy
```

🔄 Summary Table

Plugin / Library	Purpose	Required	Notes
`torch`	Core tensor library (RoBERTa)	✅	Use CUDA version if needed
`transformers`	RoBERTa & HuggingFace models	✅	Emotion classification
`llama-cpp-python`	LLaMA runner (.gguf support)	✅	Works on CPU or Metal/GPU
`accelerate`	Optional performance/device manager	🔄	Helps auto GPU switch
`sentencepiece`	Optional tokenizer support	🔄	May be required for some
`numpy`	Numerical helper (used internally)	🔄	Lightweight and common