

Meow AI: Minimum Viable Knowledge (MVK)

What every team member needs to know to survive this project.

Python & Data Handling

You don't need to be a Python expert, but you must know:

- **Virtual Envs:** How to create and activate (`python -m venv venv`).
- **NumPy:** Understanding Array shapes (e.g., what `(3, 224, 224)` means).
- **Pandas:** Loading CSVs (`pd.read_csv`) and filtering rows.
- **OS Library:** Handling file paths (`os.path.join`) so code works on Windows & Linux.

Deep Learning (PyTorch/HF)

For Mohamed (Lead) & Team:

- **Tensors:** Moving data to GPU (`.to('cuda')`).
- **Hugging Face:** Using `from_pretrained()` to load BLIP-2.
- **Training Loop:** Understanding the 3 steps: Forward pass → Loss calculation → Backward pass.
- **LoRA:** Concept: We only train 1% of the parameters (adapters), not the whole model.

Streamlit (The UI)

For showing the demo:

- **Widgets:** `st.file_uploader` (for images) and `st.write` (for text).
- **Layout:** Using `st.columns` to put the Image on the Left and Text on the Right.
- **Session State:** Keeping the image on screen after clicking a button.

Git & GitHub

Required to avoid deleting each other's work:

- **Basic Commands:** `clone`, `add`, `commit`, `push`.
- **Pulling:** Always run `git pull` before you start working.
- **.gitignore:** Knowing why we don't push the 5GB dataset or the `venv` folder to GitHub.
- **Branches:** (Optional but good) Create a branch for your feature, merge later.

Docker (Containers)

For Dhia (Lead) & Team:

- **Concept:** "It works on my machine" is not an excuse. Docker makes it work everywhere.
- **Dockerfile:** Know what `FROM python:3.9` and `RUN pip install do`.
- **Commands:** `docker build -t meow-ai .` and `docker run`.
- **Mounting:** Mapping your local folder to the container to save results.

Kaggle & Colab (The GPU)

Where the heavy lifting happens:

- **Runtime Type:** Always verify Hardware Accelerator is set to **GPU (T4)**.
- **Persistence:** Knowing that files in Colab disappear when you close the tab (save to Drive!).
- **Secrets:** Storing your Hugging Face Token in "Kaggle Secrets" (not in code).