AI Tool Usage Document: MLOps OPPE-2

- **Student Roll Number:** 21F2000730
- **Project:** MLOps OPPE-2 (MAY 2025) - Heart Disease Prediction

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Utilized AI Tools

- **Gemini** (by Google)

Prompts Utilized

Below is a summary of the key prompts used to direct the AI tool during the project, categorized by task.

1. Environment & Authentication

- "Debug a `git commit` failure related to `Author identity unknown` and provide the necessary `git config` commands."
- "Resolve a `git push` rejection caused by divergent branches by providing the correct sequence of `git pull` and `git push`."

2. API & Model Development

- "Generate a Python script using FastAPI to create a prediction API. The script should load a `joblib` model and define an input schema using Pydantic for all model features."
- "Generate Python code to perform a data poisoning attack by flipping 15% of the training labels and retraining the model."
- "Generate a Python script to perform a Kolmogorov-Smirnov (K-S) test for data drift between two dataframes and interpret the p-value."
- "Debug a `ValueError: could not convert string to float` during model fitting and provide a code snippet to handle categorical data encoding."
- "Debug a `NameError` in a Jupyter Notebook related to out-of-order cell execution."
- "Debug a `KeyError` on a pandas DataFrame within the deployed API."

3. Containerization (Docker)

- "Generate a `Dockerfile` for a Python FastAPI application that uses `uvicorn`."
- "Provide the `gcloud` command to create a Docker repository in Google Artifact Registry."
- "Provide the `docker build` and `docker push` commands to build a container and push it to a specified Google Artifact Registry path, including the correct version tag."

4. Deployment (Kubernetes)

- "Generate a Kubernetes `deployment.yaml` file to run a container from an Artifact Registry image path, including CPU and memory resource requests."
- "Generate a Kubernetes `service.yaml` of type `LoadBalancer` to expose a deployment on port 80 and target the container's port 8080."
- "Generate a Kubernetes `hpa.yaml` file to autoscale a deployment between 1 and 3 pods based on a 50% average CPU utilization target."
- "Provide the `kubectl` command to apply all YAML manifest files in the current directory."
- "Provide the `kubectl` command to view the logs of a specific pod to debug an 'Internal Server Error'."
- "Provide the `kubectl set image` command to perform a rolling update of a Kubernetes deployment to a new container image version."

5. Final Report Generation

- "Generate a complete `README.md` file summarizing the project's findings, including formatted markdown tables and code blocks for all seven project deliverables."
- "Reformat a section of text into a clean markdown table."