MLOps Task Report

1. What is MLOps?

MLOps stands for Machine Learning Operations. MLOps is a core function of Machine Learning engineering, focused on streamlining the process of taking machine learning models to production, and then maintaining and monitoring them.

2. MLFlow

MLflow is a platform to streamline machine learning development, including tracking experiments, packaging code into reproducible runs, and sharing and deploying models. Main work of MLFlow are:

- Experiment Tracking
- Model Management

3. Prefect

Prefect is an open-sourced framework to build workflows in Python. Prefect makes it easy to build, run, and monitor data pipelines at scale.

- Workflow Management.
- Scheduling and Monitoring Tasks.
- Manage ML Pipelines

4. Why Experiment tracking is important?

Experimental tracking allows data scientists to identify factors that would affect a model's performance, compare results and select the optimal version. It is very important to stay organized throughout the iterative learning process,l even if your models do not make it into production

"Save everything in one place and never lose your progress again."

5. ML Flow Implementation Steps:

- Step 1 - Import MLFlow
  - import mlflow
- Step 2 - Set the tracker and experiment
  - mlflow.set_tracking_uri(DATABASE_URI)
  - mlflow.set_experiment("EXPERIMENT_NAME")
- Step 3 - Start a experiment run
  - with mlflow.start_run():
- Step 4 - Logging the metadata
  - mlflow.set_tag(KEY, VALUE)
  - mlflow.log_param(KEY, VALUE)
  - mlflow.log_metric(KEY, VALUE)
- Step 5 - Logging the model and other files (2 ways)
  - mlflow.<FRAMEWORK>.log_model(MODEL_OBJECT, artifact_path="PATH")
  - mlflow.log_artifact(LOCAL_PATH, artifact_path="PATH")

6. Prefect Implementation Steps:

Creating and activating a Virtual Environment

- In order to install prefect, create a virtual environment:
  - $ python -m venv virenv

- Enter the Virtual Environment using below mentioned command:
  - $.\virenv\Scripts\activate

Installing Prefect 2.0

- $ pip install prefect

- OR if you have Prefect 1, upgrade to Prefect 2 using this command:
  - $ pip install -U prefect

- OR to install a specific version:
  - $ pip install prefect==2.4

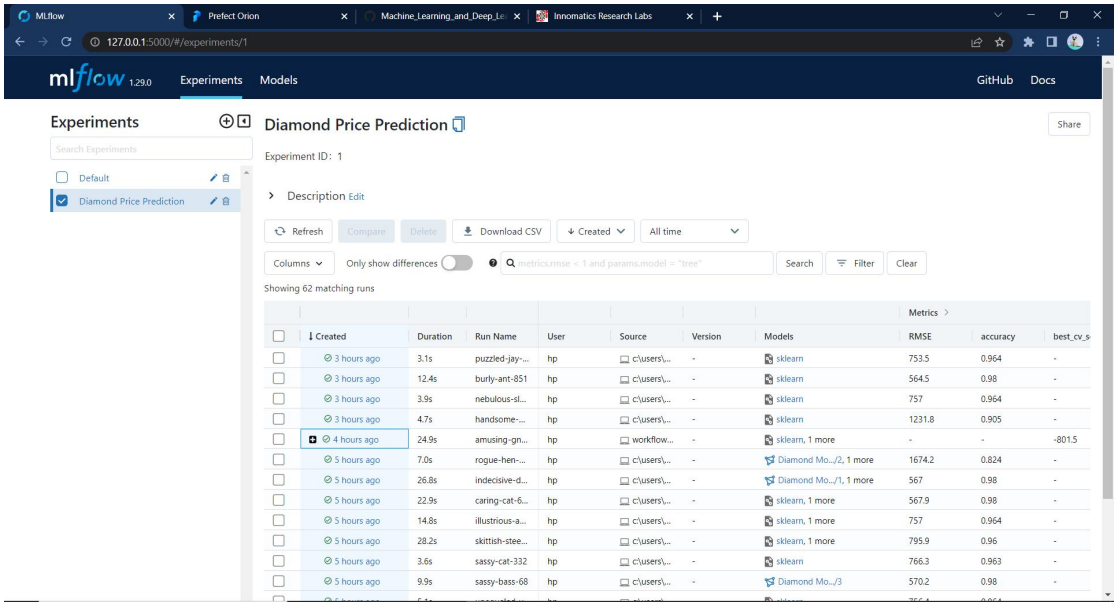
Check Prefect Version

- $ prefect version

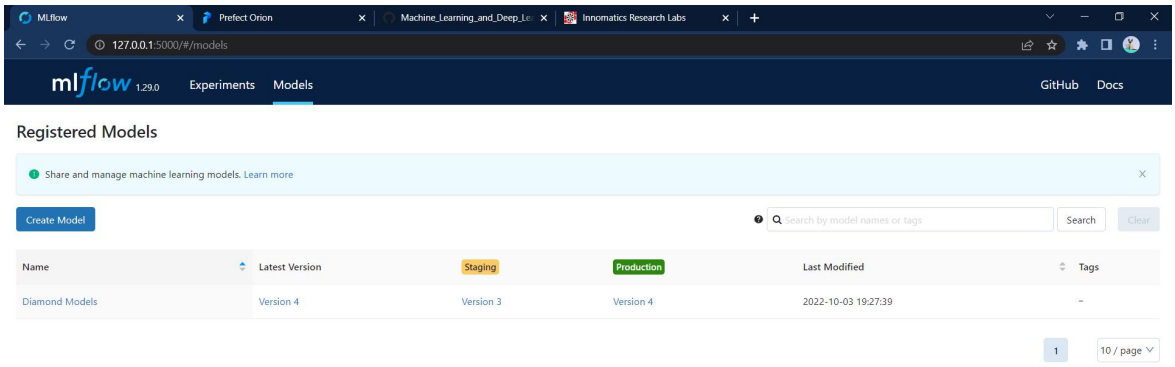
Running Prefect Dashboard

- $ prefect orion start

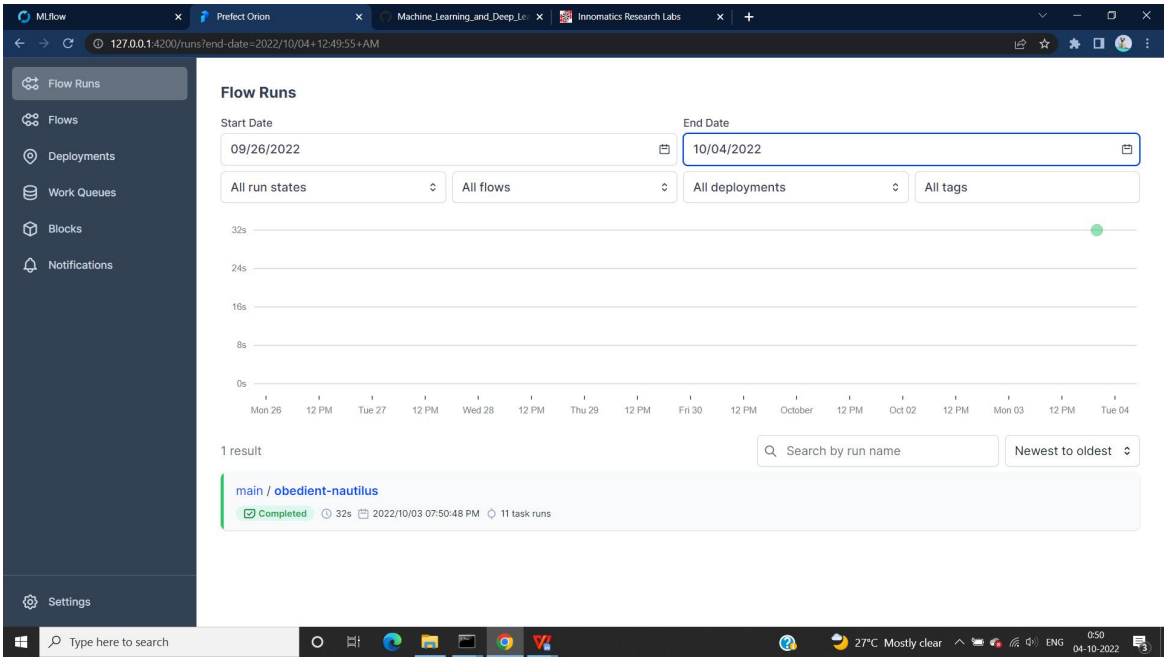
7. Implemented MLFlow Experiment Tracking:



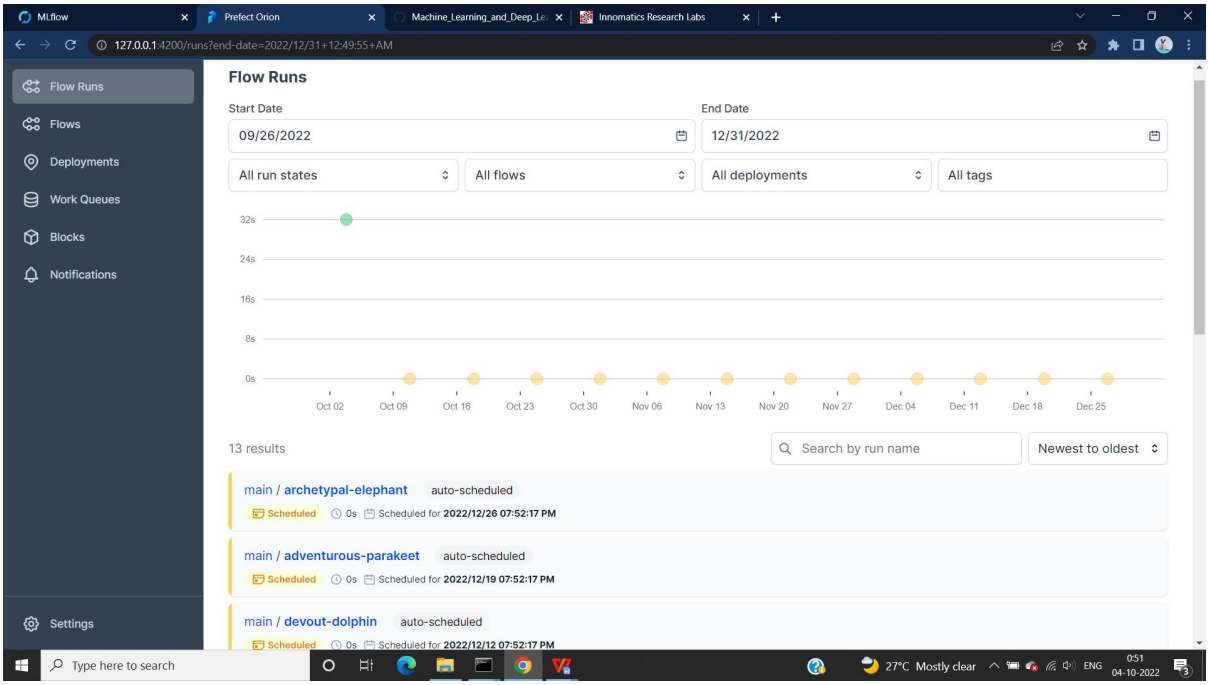
8. Implemented MLFlow Model Management:



9. Implemented Prefect (Flow Runs):



10. Implemented Prefect (Auto-Scheduling):



Github link: https://github.com/dhreeti414/Innomatics_Internship_July_2022

LinkedIn link: https://www.linkedin.com/in/dhreetikesharwani/