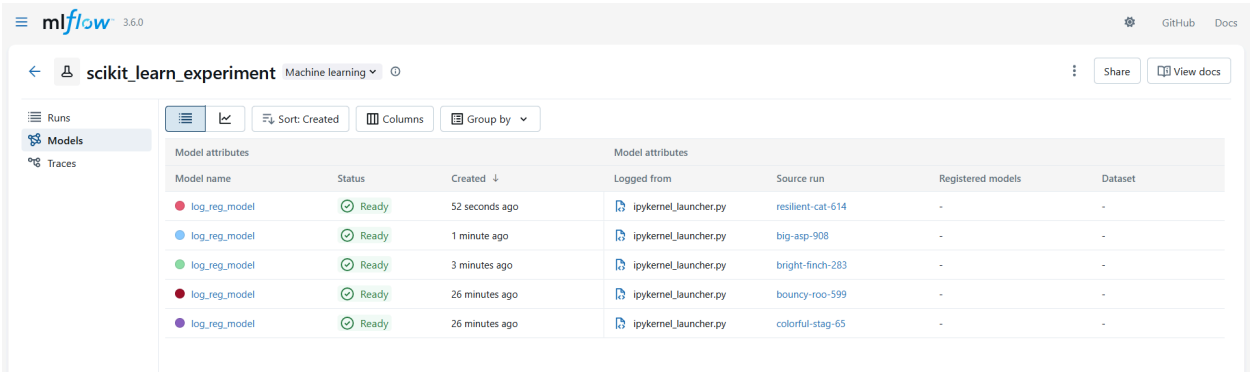
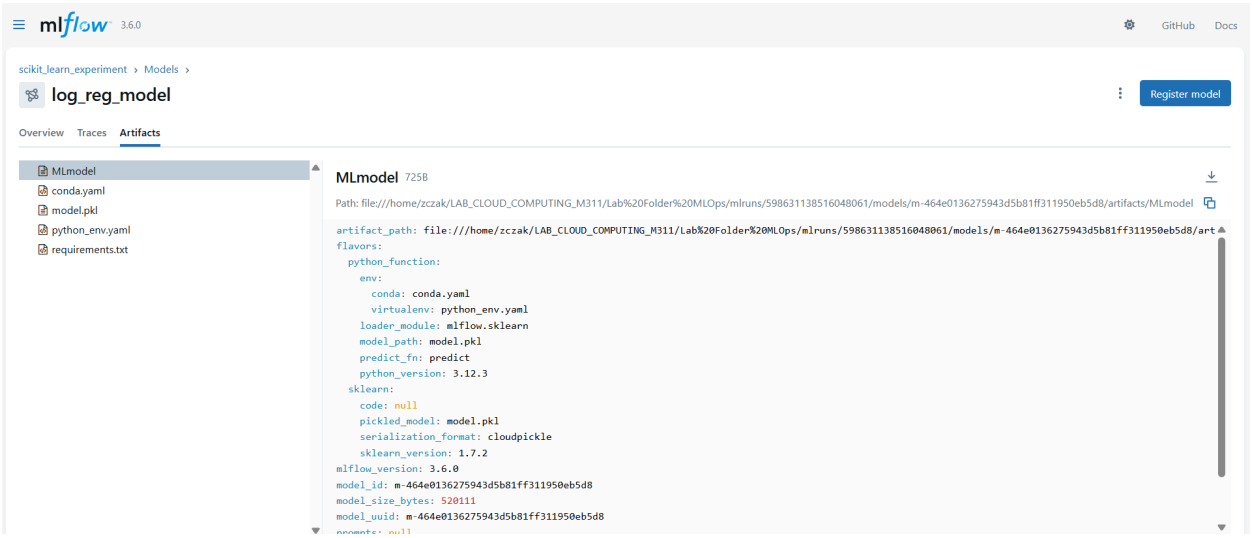
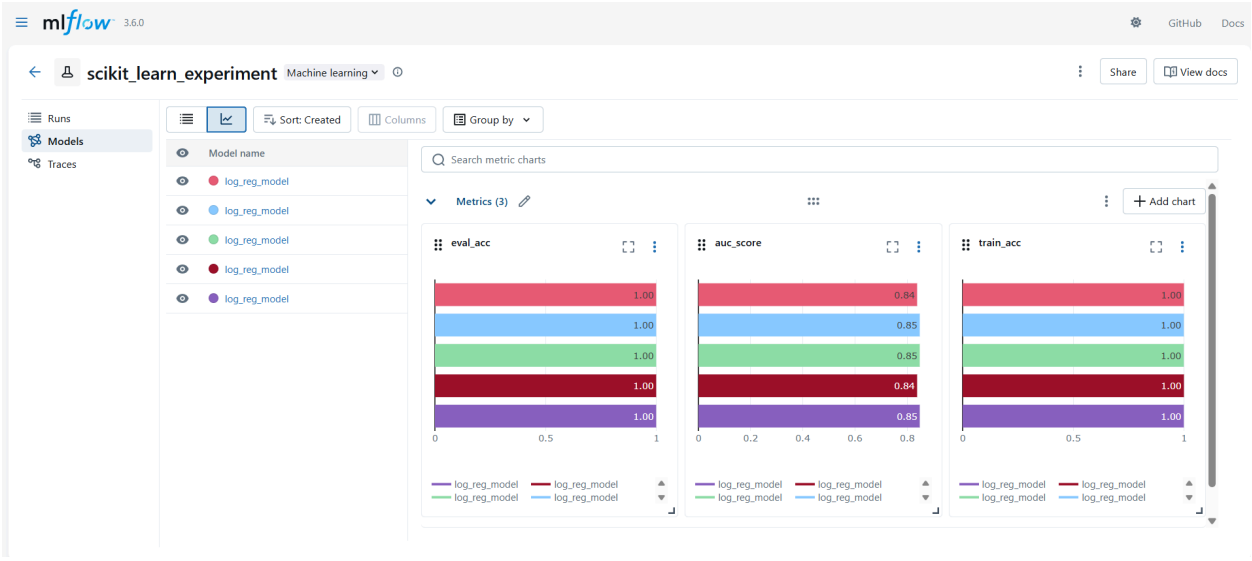
Zakaria CHOUKRI

Lab MLFlow - Cloud Computing - M311





Comparing metrics



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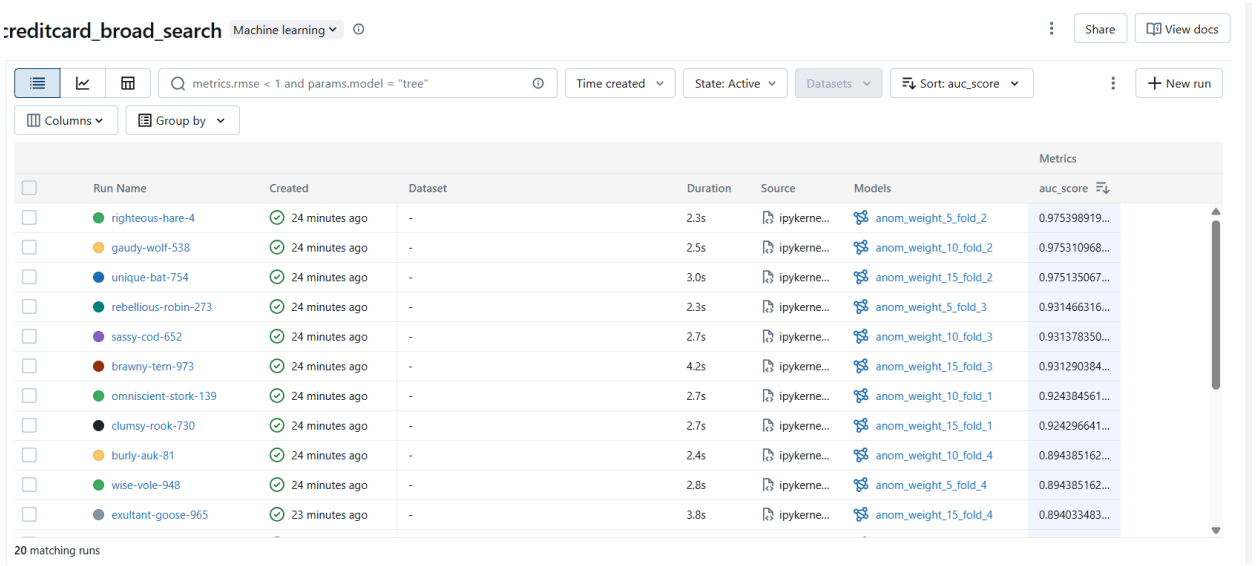
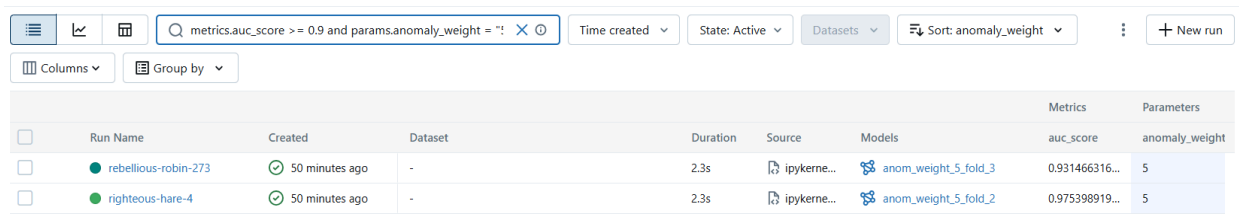
Loading a logged model

Hyperparameter tuning

Sort by AUC score



metrics.auc_score >= 0.9 and params.anomaly_weight = "5"



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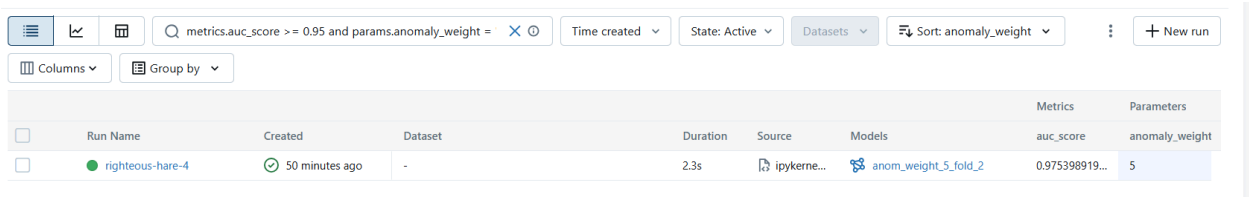
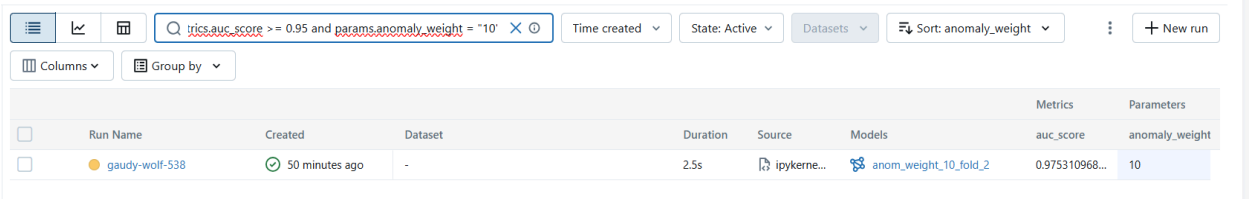
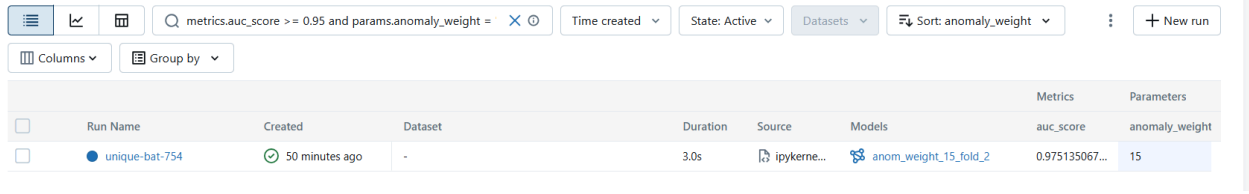
metrics.auc_score >= 0.95 and params.anomaly_weight = "5"



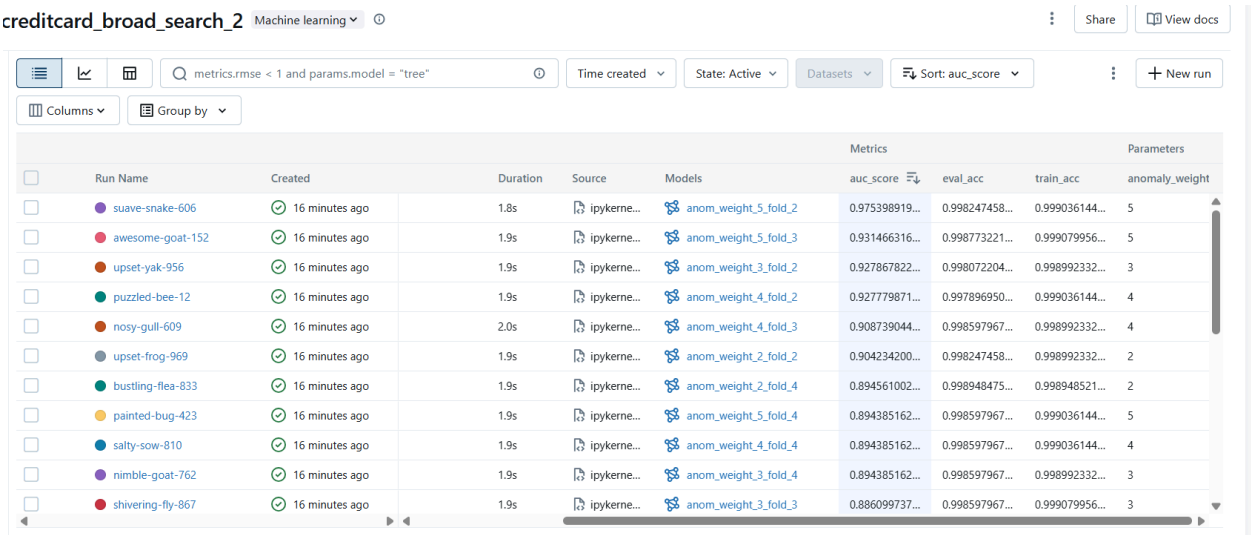
metrics.auc_score >= 0.95 and params.anomaly_weight = "10"



metrics.auc_score >= 0.95 and params.anomaly_weight = "15"



Le meilleur interval est de [5, 10]



Même si on essaie avec [1, 2, 3, 4, 5] le meilleur weight reste 5.

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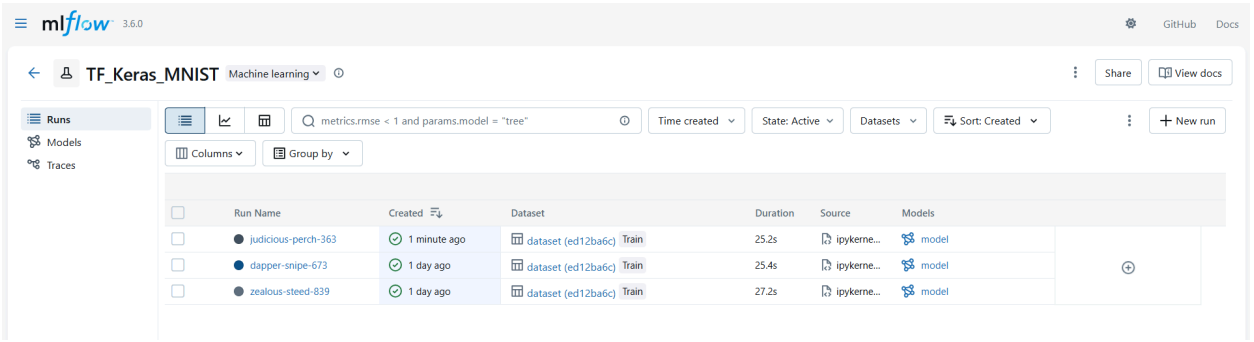
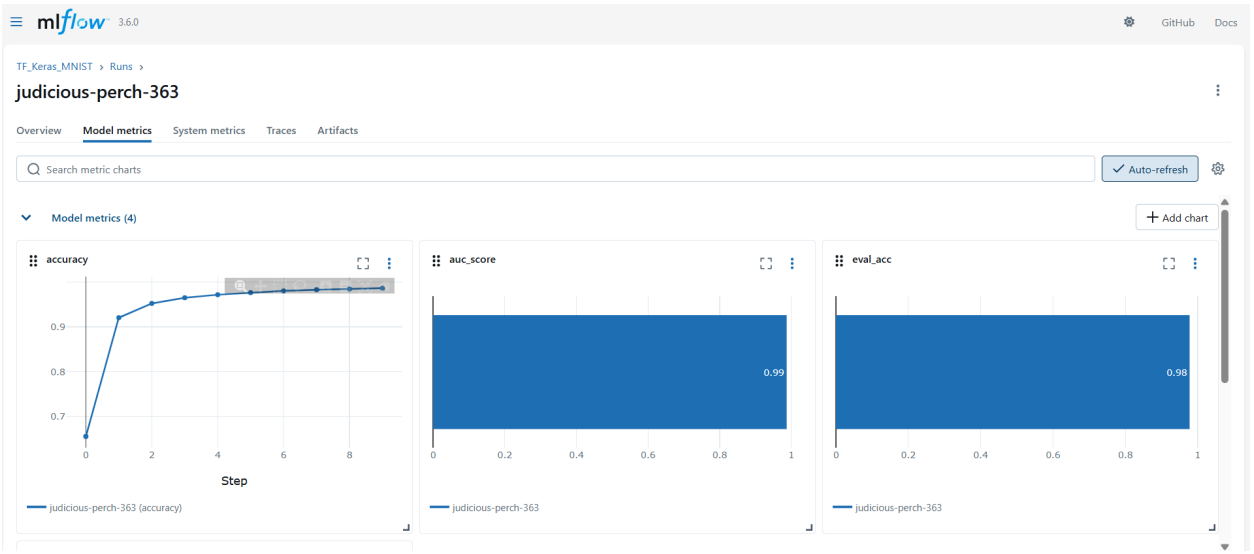
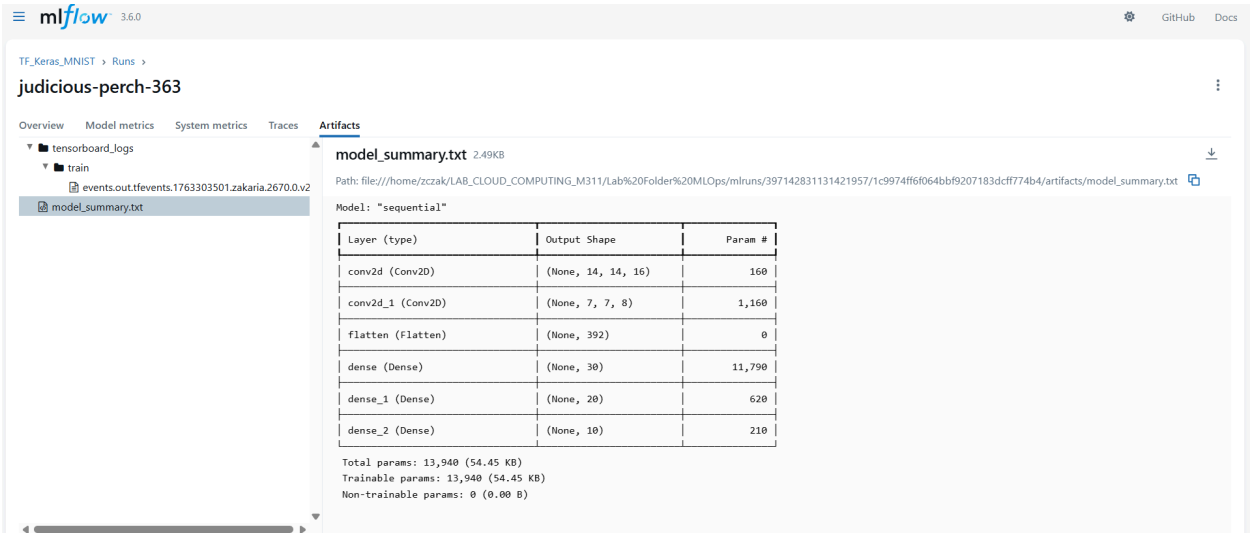
2- MLFlow with Tensorflow







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4- Local model serving - deployment

```
❯ mlflow models serve --model-uri runs:/426d47f594c445a9ab8709e23c0b9b13/log_reg_model -p 1235
/home/zczak/LAB_CLOUD_COMPUTING_M311/Lab Folder MLOps/venv/lib/python3.12/site-packages/mlflow/tracking/_tracking_servic
e/utils.py:140: FutureWarning: Filesystem tracking backend (e.g., './mlruns') is deprecated. Please switch to a database
 backend (e.g., 'sqlite:///mlflow.db'). For feedback, see: https://github.com/mlflow/mlflow/issues/18534
  return FileStore(store_uri, store_uri)
2025/11/16 15:38:24 INFO mlflow.models.flavor_backend_registry: Selected backend for flavor 'python_function'
2025/11/16 15:38:24 INFO mlflow.utils.virtualenv: Environment /home/zczak/.mlflow/envs/mlflow-567b28edbc31fa1f5c709f93f0
266fa290dea436 already exists
2025/11/16 15:38:24 INFO mlflow.utils.environment: == Running command '['bash', '-c', 'source /home/zczak/.mlflow/envs/
mlflow-567b28edbc31fa1f5c709f93f0266fa290dea436/bin/activate && python -c ""']'
2025/11/16 15:38:24 INFO mlflow.utils.environment: == Running command '['bash', '-c', 'source /home/zczak/.mlflow/envs/
mlflow-567b28edbc31fa1f5c709f93f0266fa290dea436/bin/activate && exec uvicorn --host 127.0.0.1 --port 1235 --workers 1 ml
flow.pyfunc.scoring_server.app:app']'
/home/zczak/LAB_CLOUD_COMPUTING_M311/Lab Folder MLOps/venv/lib/python3.12/site-packages/mlflow/tracking/_tracking_servic
e/utils.py:140: FutureWarning: Filesystem tracking backend (e.g., './mlruns') is deprecated. Please switch to a database
 backend (e.g., 'sqlite:///mlflow.db'). For feedback, see: https://github.com/mlflow/mlflow/issues/18534
  return FileStore(store_uri, store_uri)
INFO:     Started server process [5221]
INFO:     Waiting for application startup.
INFO:     Application startup complete.
INFO:     Uvicorn running on http://127.0.0.1:1235 (Press CTRL+C to quit)
```

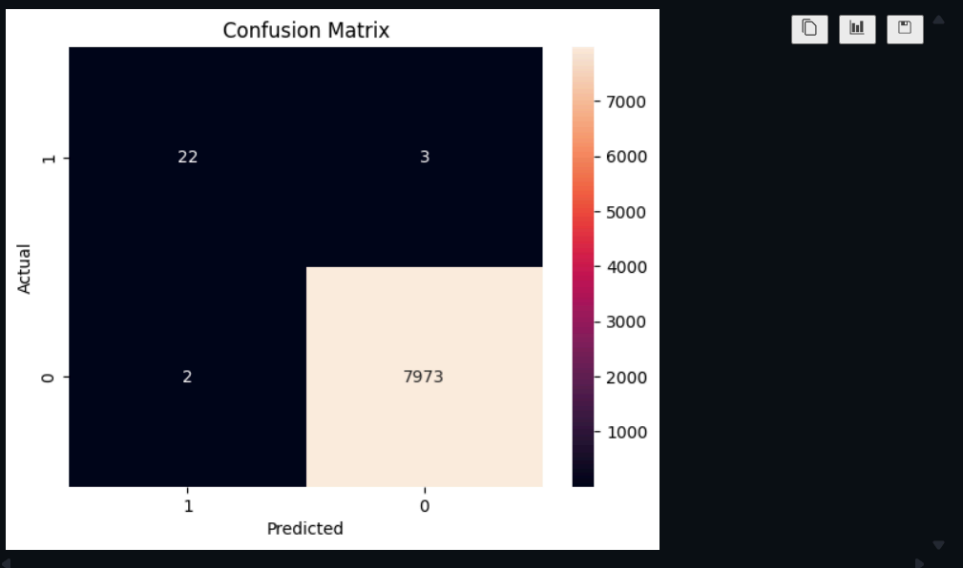
Interrogation en utilisant requests

```python
import requests

host = '127.0.0.1'
port = '1235'

url = f'http://{host}:{port}/invocations'

headers = {
    'Content-Type': 'application/json',
}
r = requests.post(url=url, headers=headers, data=input_json)

preds_dict = r.json()
print(f'Predictions: {preds_dict["predictions"]}')
```

[20] ✓ 0.0s Python

```
Predictions: [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
```

```
Text(0.5, 1.0, 'Confusion Matrix')
```



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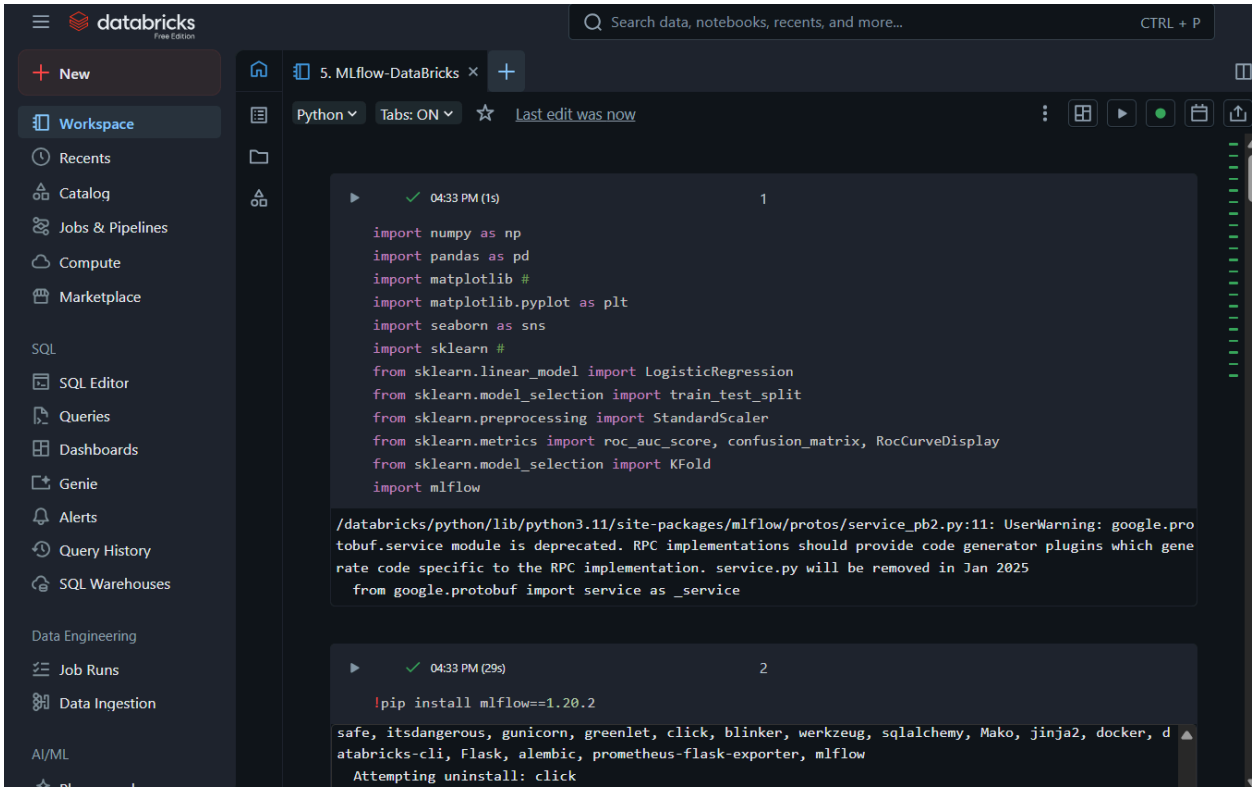
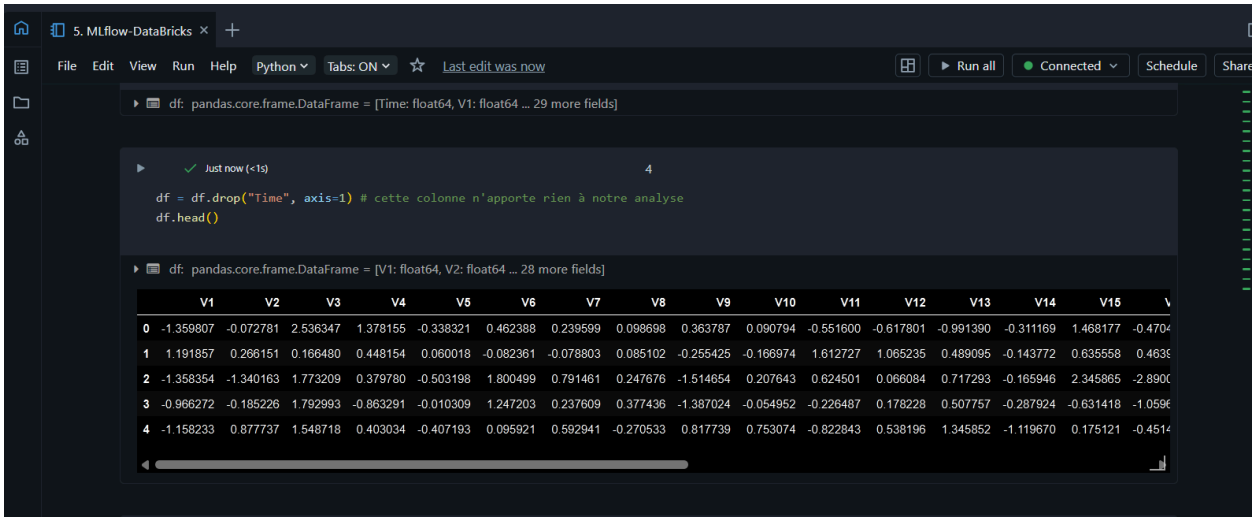
5- MLFlow Databricks





Je configure databricks cli pour pouvoir lancer

```
❯ databricks configure --token
Databricks Host (should begin with https://): https://dbc-15fdc886-7696.cloud.databricks.com/
Token:
```

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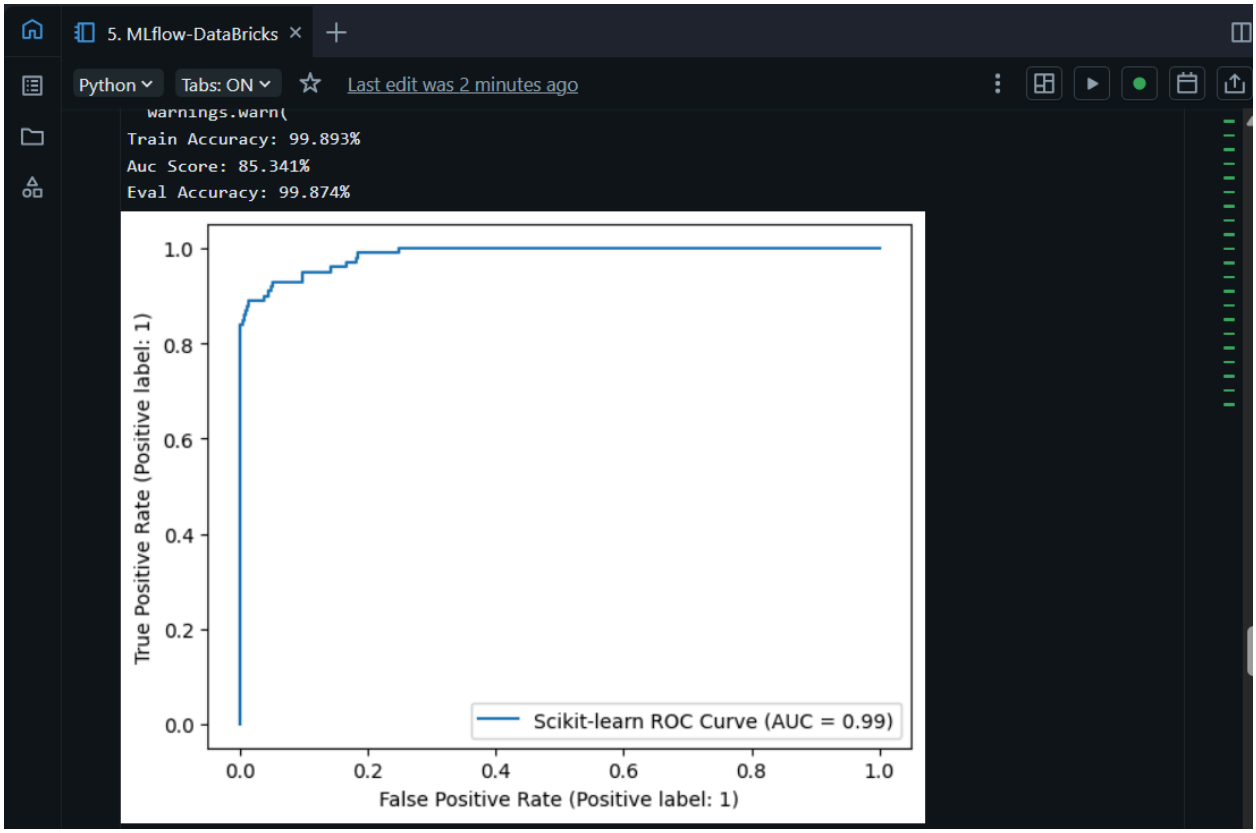
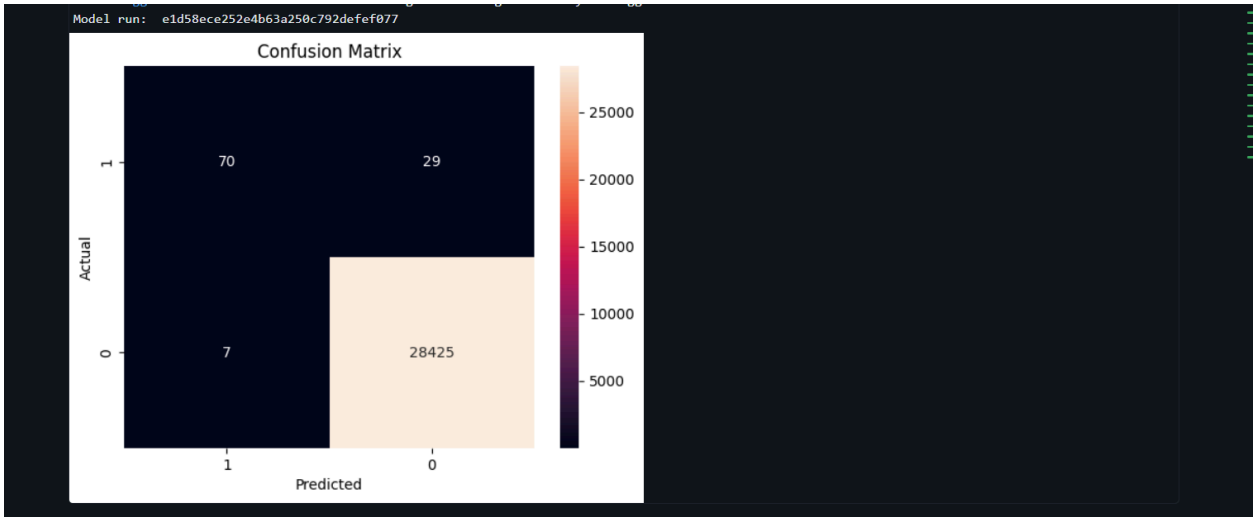
J’ai run l’experiment





Now for the last process, it took 44 minutes

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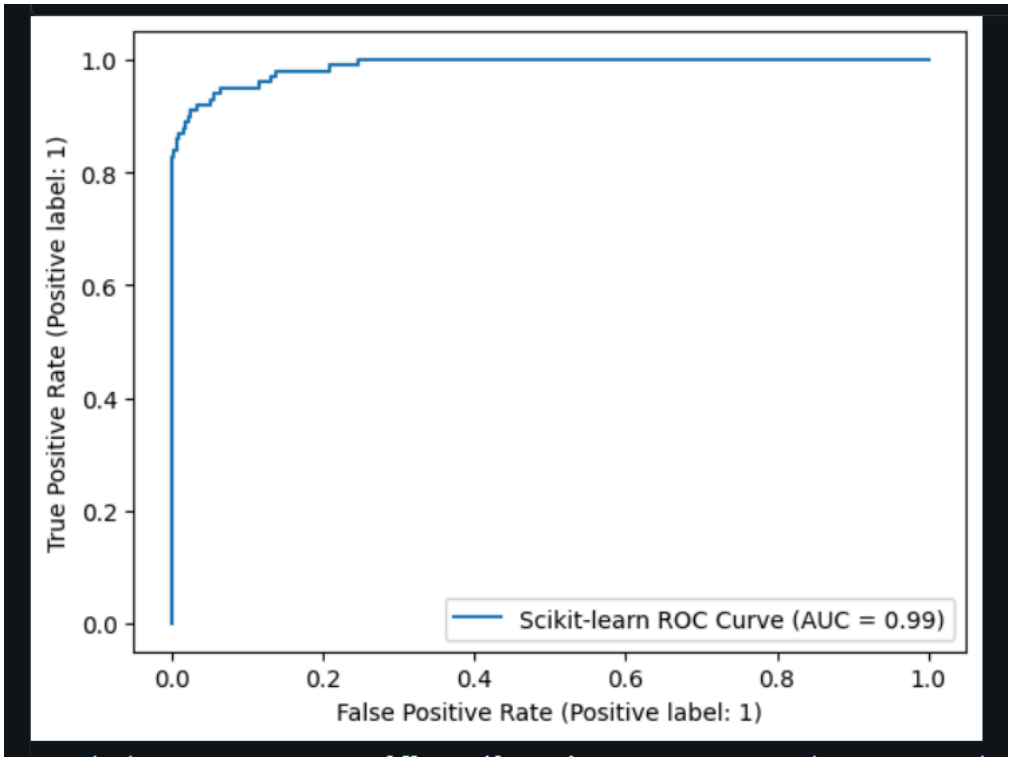
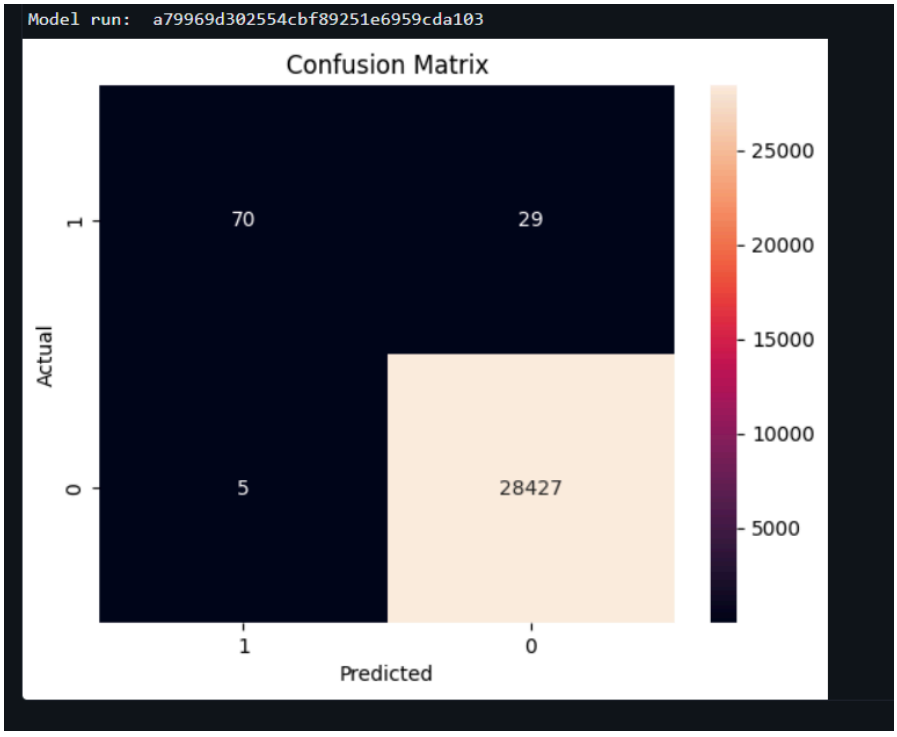
```
Train Accuracy: 99.897%
Auc Score: 85.345%
Eval Accuracy: 99.881%
```





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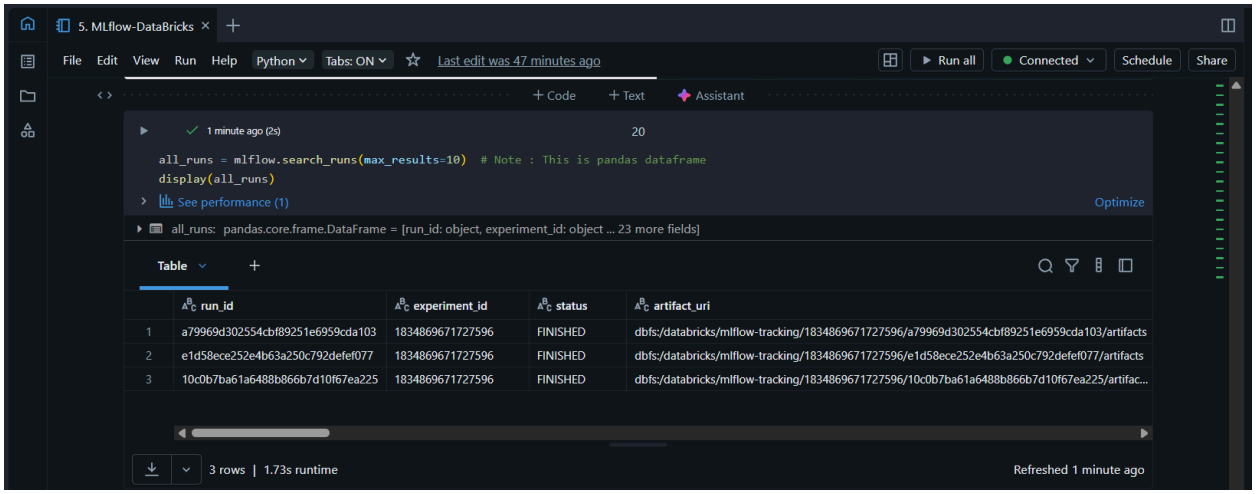
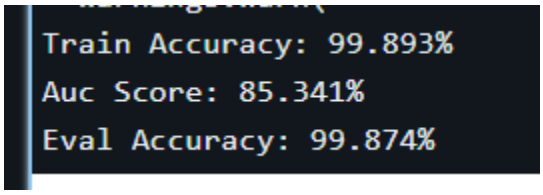


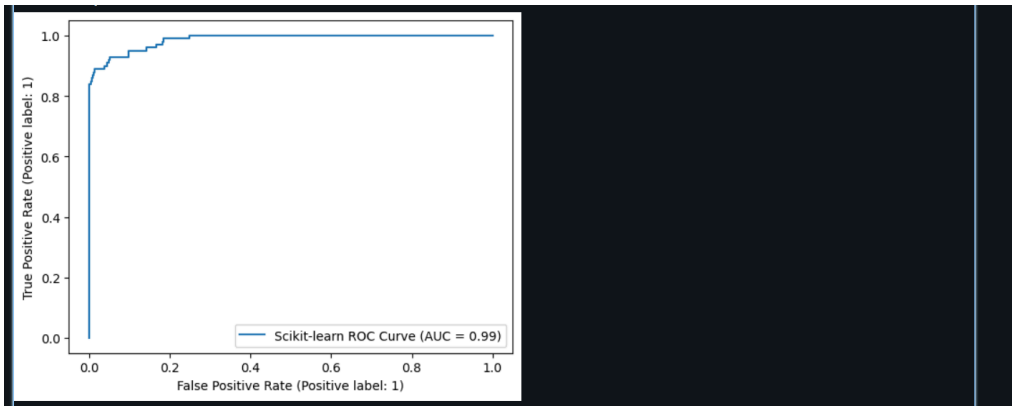
TAF:

1. réexécutez la cellule 18 en utilisant d'autres modèle ML de SKlearn
2. comparez vos résultats en utilisant l'outil de comparaison de MLFlow

```
8  models = [
9      ("LogisticRegression", LogisticRegression(random_state=None, max_iter=10, solver='newton-cg')),
10     ("RandomForest", RandomForestClassifier(n_estimators=100, random_state=2020)),
11     ("SVC", SVC(probability=True, random_state=2020))
12 ]
```

Logistic regression





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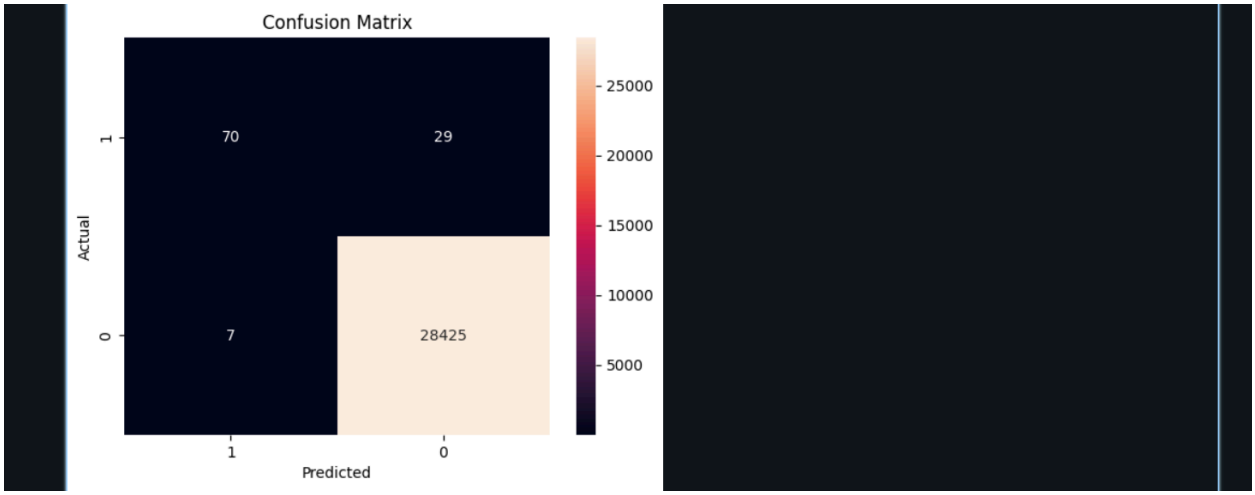
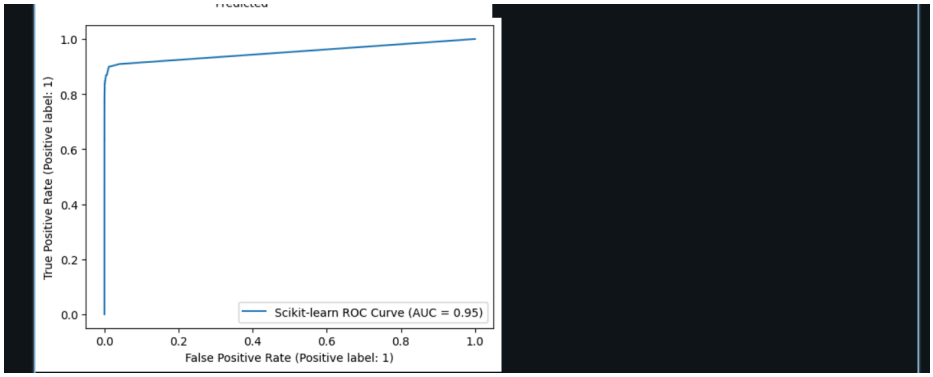
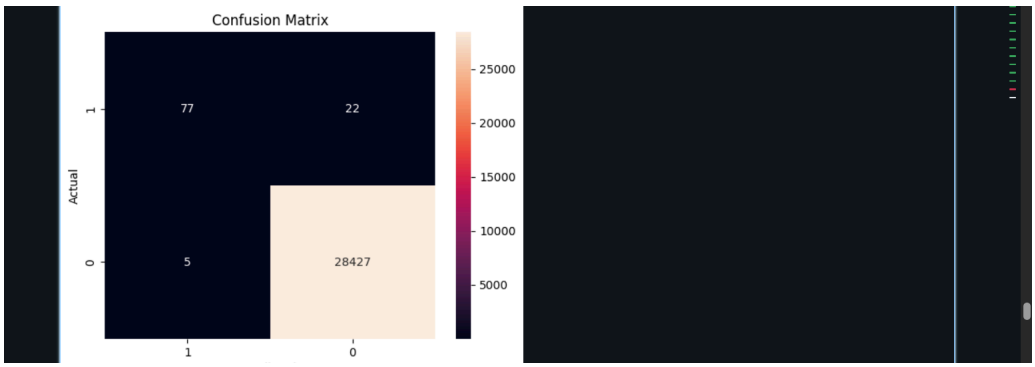
```
Train Accuracy: 100.000%
Auc Score: 88.880%
Eval Accuracy: 99.905%
```



Random Forest




```
Train Accuracy: 99.943%
Auc Score: 83.833%
Eval Accuracy: 99.877%
```



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SVC