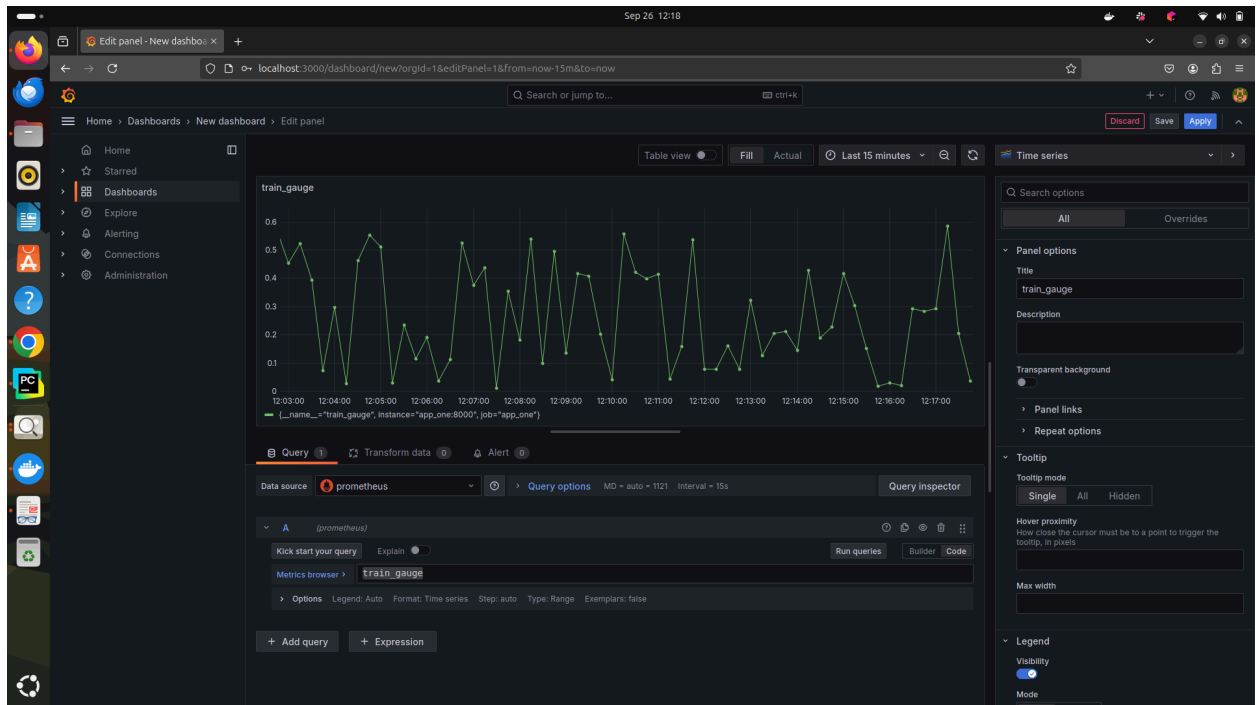


## SCREENSHOTS LAB 3

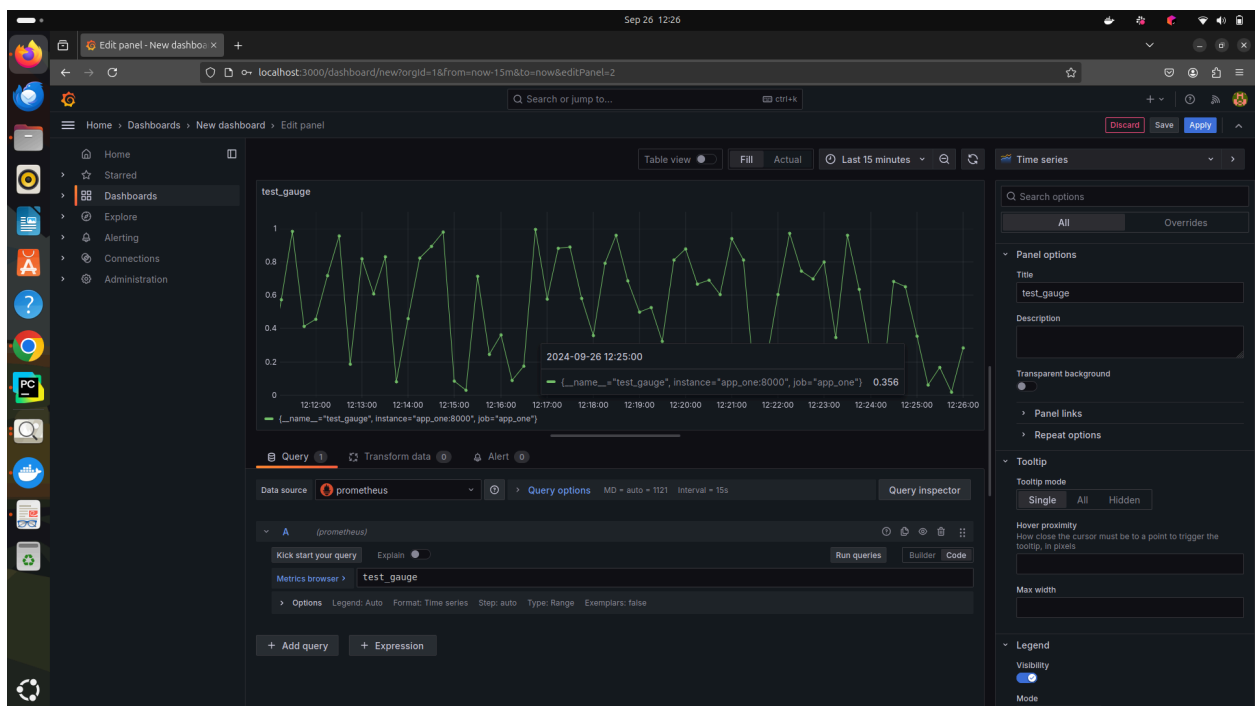
Add new metrics to Prometheus/Grafana. Add your two metrics to your Grafana dashboard as simple time series (graphs over time of a single value) and take screen shots to confirm they are running.

The screenshot below shows the **train\_gauge** and **test\_gauge** metrics which we defined in the last lab.

### Train Gauge



### Test Gauge



Implementation of prophet model in Python. Correctness of pulling train and test data, not overlapping time series, iterating through requested number of test loops, retraining.

```
model_evaluation.py x config.yml README.md docker-compose.yml prometheus/Dockerfile app_one/Dockerfile app.py requirements.txt model/Dockerfile
def calculate_mae_and_mape(evaluation):
    logging.info(f'Mean Absolute Error (MAE): {mae}')
    logging.info(f'Mean Absolute Percentage Error (MAPE): {mape}')
    return mae, mape

def main():
    url = os.getenv('PROMETHEUS_URL', 'http://localhost:9090')
    prom = prometheus_connection(url)
    yuyunfrancis, 9/24/24, 2:08 PM • lab3: setup

Terminal Local x +
model 2024-09-26 19:07:09,375 - INFO - Chain [1] start processing
model 2024-09-26 19:07:09 - cmdstanpy - INFO - Chain [1] done processing
model 2024-09-26 19:07:09,596 - INFO - Chain [1] done processing
model 2024-09-26 19:07:09,665 - INFO - Evaluation data: timestamp value ... yhat error
model 2024-09-26 19:08:12,39199960 0.976781 ... 0.312118 0.664663
model 2024-09-26 19:08:17,39199960 0.248798 ... 0.312118 -0.633121
model [2 rows x 5 columns]
model 2024-09-26 19:07:09,466 - INFO - Total anomalies detected: 1
model 2024-09-26 19:07:09,667 - INFO - Anomalies detected:
model 2024-09-26 19:07:09,667 - INFO - timestamp value ... yhat error
model 2024-09-26 19:08:12,39199960 0.976781 ... 0.312118 0.664663
model [1 rows x 5 columns]
model 2024-09-26 19:07:09,678 - INFO - Anomaly count set to: 1
model 2024-09-26 19:07:09,679 - INFO - Mean Absolute Error (MAE): 0.3639917408892358
model 2024-09-26 19:07:09,680 - INFO - Mean Absolute Percentage Error (MAPE): 46.74843723224789
model 2024-09-26 19:07:09,680 - INFO - MAE set to: 0.3639917408892358
model 2024-09-26 19:07:09,680 - INFO - MAPE set to: 46.74843723224789
model 2024-09-26 19:07:09,694 - INFO - Fetched data for 'train_gauge':
model 2024-09-26 19:08:12,38599918 0.15767738673132486
model 2024-09-26 19:08:12,38599918 0.1223122515151812
model 2024-09-26 19:08:12,387000884 0.20451648859443356
model 2024-09-26 19:08:12,387000884 0.2732769744330803
model 2024-09-26 19:08:12,387000884 0.5299387534497013
model 2024-09-26 19:07:09,695 - INFO - Waiting for 60 seconds before fetching test data...
model 2024-09-26 19:08:09,711 - INFO - Fetched data for test_gauge:
model 2024-09-26 19:07:12,391000032 0.6333904931082024
model 2024-09-26 19:07:17,391000032 0.6128228832475822
model 2024-09-26 19:07:22,391000032 0.9945475203317458
model 2024-09-26 19:07:27,391000032 0.619758885977291
model 2024-09-26 19:07:32,391000032 0.2904327725163439
model 2024-09-26 19:08:09,741 - DEBUG - input tempfile: /tmp/tmpof59b4td/4uksdt48.json
model 2024-09-26 19:08:09,742 - DEBUG - input tempfile: /tmp/tmpof59b4td/7vbpl0mw.json
model 2024-09-26 19:08:09,744 - DEBUG - idx: 0
model 2024-09-26 19:08:09,744 - DEBUG - running CmdStan, num_threads: None
model 2024-09-26 19:08:09,744 - DEBUG - CmdStan args: ['/usr/local/lib/python3.12/site-packages/prophet/stan_model/prophet_model.bin', 'random', 'seed=24287', 'data',
PrometheusSandbox > containers > model > model_evaluation.py 3 hrs 8 mins 1.1k Up-to-date Blame: yuyunfrancis 9/24/24, 2:08 PM 75:1 LF UTF-8 4 spaces Python 3.12
```

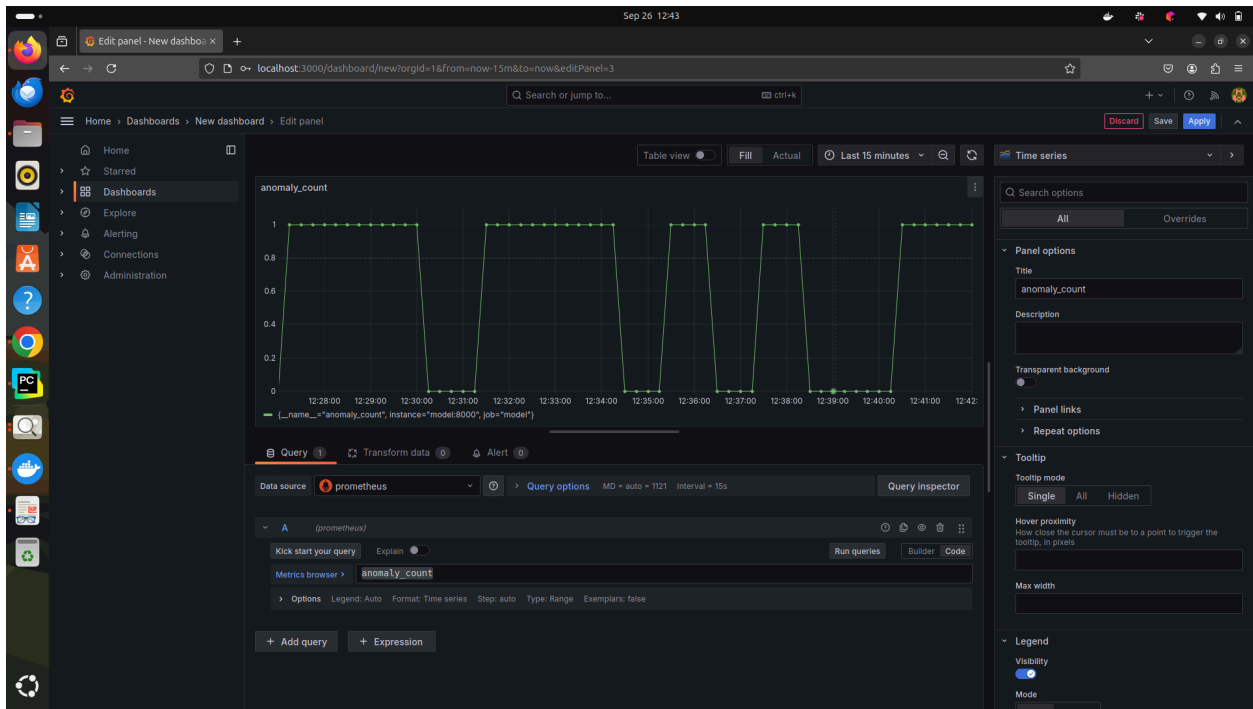
```
model_evaluation.py x config.yml README.md docker-compose.yml prometheus/Dockerfile app_one/Dockerfile app.py requirements.txt model/Dockerfile
def calculate_mae_and_mape(evaluation):
    logging.info(f'Mean Absolute Error (MAE): {mae}')
    logging.info(f'Mean Absolute Percentage Error (MAPE): {mape}')
    return mae, mape

def main():
    url = os.getenv('PROMETHEUS_URL', 'http://localhost:9090')
    prom = prometheus_connection(url)
    yuyunfrancis, 9/24/24, 2:08 PM • lab3: setup

Terminal Local x +
model 2024-09-26 19:11:10,308 - DEBUG - idx: 0
model 2024-09-26 19:11:10,308 - DEBUG - running CmdStan, num_threads: None
model 2024-09-26 19:11:10,308 - DEBUG - CmdStan args: ['/usr/local/lib/python3.12/site-packages/prophet/stan_model/prophet_model.bin', 'random', 'seed=41591', 'data',
'file=/tmp/tmpof59b4td/kapobit1.json', 'init=/tmp/tmpof59b4td/hf6071qd.json', 'output', 'file=/tmp/tmpof59b4td/prophet_model_inicpr5/prophet_model-20240926191110.csv', 'method=optimize', 'algorithm=newton',
'iter=10000']
model 19:11:10 - cmdstanpy - INFO - Chain [1] start processing
model 2024-09-26 19:11:10,308 - INFO - Chain [1] done processing
model 19:11:10 - cmdstanpy - INFO - Chain [1] done processing
model 2024-09-26 19:11:10,335 - INFO - Chain [1] done processing
model 2024-09-26 19:11:10,408 - INFO - Evaluation data: timestamp value ... yhat error
model 2024-09-26 19:10:12,39199960 0.341024 ... 0.293803 0.847821
model 2024-09-26 19:10:17,39199960 0.980354 ... 0.293803 0.686551
model [2 rows x 5 columns]
model 2024-09-26 19:11:10,409 - INFO - Total anomalies detected: 1
model 2024-09-26 19:11:10,409 - INFO - timestamp value ... yhat error
model 2024-09-26 19:10:17,39199960 0.980354 ... 0.293803 0.686551
model [1 rows x 5 columns]
model 2024-09-26 19:11:10,429 - INFO - Anomaly count set to: 1
model 2024-09-26 19:11:10,431 - INFO - Mean Absolute Error (MAE): 0.36718599113268235
model 2024-09-26 19:11:10,431 - INFO - Mean Absolute Percentage Error (MAPE): 42.01450811222845
model 2024-09-26 19:11:10,432 - INFO - MAE set to: 0.36718599113268235
model 2024-09-26 19:11:10,432 - INFO - MAPE set to: 42.01450811222845
model 2024-09-26 19:11:10,454 - INFO - Fetched data for 'train_gauge':
model 2024-09-26 19:08:12,39199960 0.03655504718403814
model 2024-09-26 19:08:17,39199960 0.3029911366488027
model 2024-09-26 19:08:22,39199960 0.0831237956872315
model 2024-09-26 19:08:27,39199960 0.11288827319684605
model 2024-09-26 19:08:32,39199960 0.5279063557554474
model 2024-09-26 19:11:10,455 - INFO - Waiting for 60 seconds before fetching test data...
model 2024-09-26 19:12:09,471 - INFO - Fetched data for test_gauge:
model 2024-09-26 19:11:12,392999887 0.5745051919793564
model 2024-09-26 19:11:17,392999887 0.4523467670462018
model 2024-09-26 19:11:22,392999887 0.4130410911619237
model 2024-09-26 19:11:27,392999887 0.4872027701010101
PrometheusSandbox > containers > model > model_evaluation.py 3 hrs 8 mins 1.1k Up-to-date Blame: yuyunfrancis 9/24/24, 2:08 PM 75:1 LF UTF-8 4 spaces Python 3.12
```

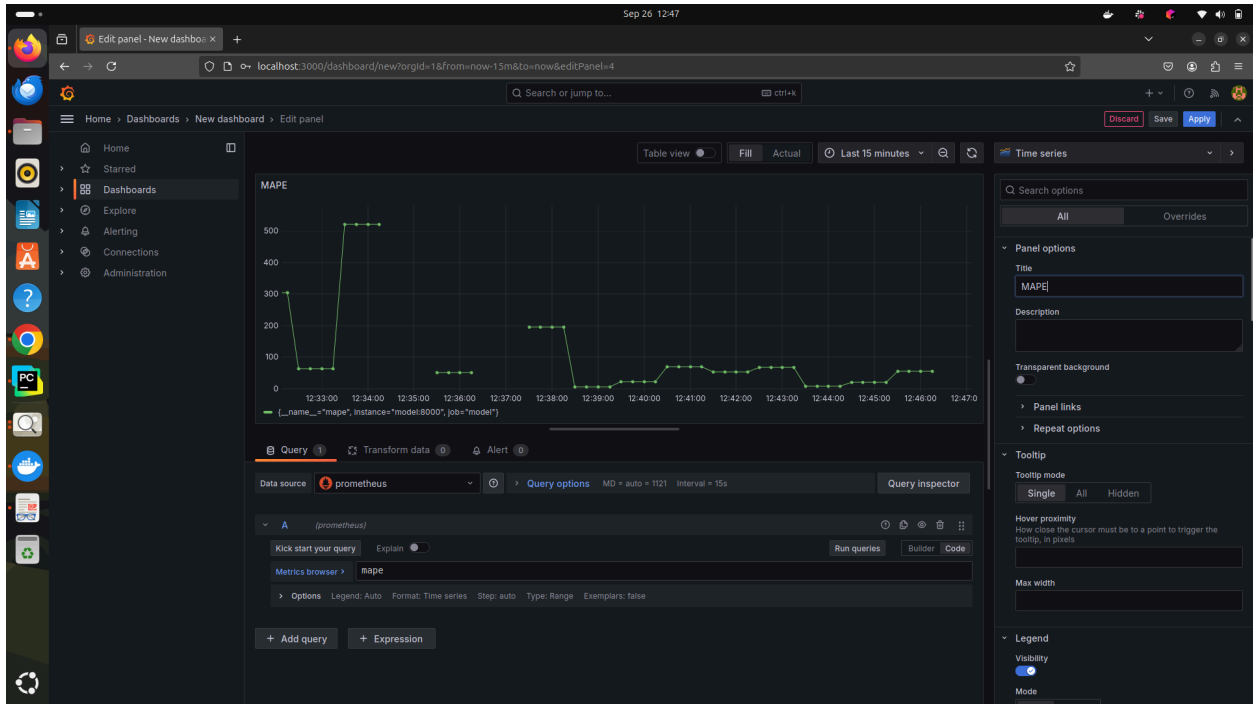
```
Terminal Local x +
model | 2024-09-26 19:45:16.982 - DEBUG - input tempfile: /tmp/tmpof59b4t0/o9jxp171.json
model | 2024-09-26 19:45:16.984 - DEBUG - input tempfile: /tmp/tmpof59b4t0/dyvhhheg.json
model | 2024-09-26 19:45:16.985 - DEBUG - idx 0
model | 2024-09-26 19:45:16.985 - DEBUG - running CmdStan, num_threads: None
model | 2024-09-26 19:45:16.985 - DEBUG - CmdStan args: ['/usr/local/lib/python3.12/site-packages/prophet/stan_model/prophet_model.bin', 'random', 'seed=19286', 'data',
model | 'file:/tmp/tmpof59b4t0/o9jxp171.json', 'init:/tmp/tmpof59b4t0/dyvhhheg.json', 'output', 'file:/tmp/tmpof59b4t0/prophet_model_m8_ljht/prophet_model-20240926194516.csv', 'method=optimize', 'algorithm=newton',
model | 'iter=10000']
model | 19:45:16 - cmdstanpy - INFO - Chain [1] start processing
model | 2024-09-26 19:45:16.985 - INFO - Chain [1] start processing
model | 19:45:17 - cmdstanpy - INFO - Chain [1] done processing
model | 2024-09-26 19:45:17.003 - INFO - Chain [1] done processing
model | 2024-09-26 19:45:17.102 - INFO - Evaluation data:
model | 0 2024-09-26 19:44:17.497000065 0.659151 ... 0.29464 0.36451 timestamp value ... yhat error
model | 0 2024-09-26 19:44:17.497000065 0.659151 ... 0.29464 0.36451
model | [1 rows x 5 columns]
model | 2024-09-26 19:45:17.104 - INFO - Total anomalies detected: 1
model | 2024-09-26 19:45:17.104 - INFO - Anomalies detected:
model | 2024-09-26 19:45:17.104 - INFO - timestamp value ... yhat error
model | 0 2024-09-26 19:44:17.497000065 0.659151 ... 0.29464 0.36451
model | [1 rows x 5 columns]
model | 2024-09-26 19:45:17.124 - INFO - Anomaly count set to: 1
model | 2024-09-26 19:45:17.127 - INFO - Mean Absolute Error (MAE): 0.36451049471871627
model | 2024-09-26 19:45:17.127 - INFO - Mean Absolute Percentage Error (MAPE): 55.300837141298716
model | 2024-09-26 19:45:17.127 - INFO - MAE set to: 0.36451049471871627
model | 2024-09-26 19:45:17.127 - INFO - MAPE set to: 55.300837141298716
model | 2024-09-26 19:45:17.145 - INFO - Fetched data for train_gauge: ds y
model | 0 2024-09-26 19:40:17.441999912 0.27415396601171615
model | 1 2024-09-26 19:40:22.437000036 0.5579189859817383
model | 2 2024-09-26 19:40:27.437000036 0.11374368477382646
model | 3 2024-09-26 19:40:32.437000036 0.59374254781182431
model | 4 2024-09-26 19:40:37.437000036 0.5767665497114953
model | 2024-09-26 19:45:17.146 - INFO - Waiting for 60 seconds before fetching test data...
```

Adding anomaly metric to the application, updating the docker-compose.yaml and prometheus config files, building the image and deploying with docker compose. Visualization for anomaly count in Grafana.

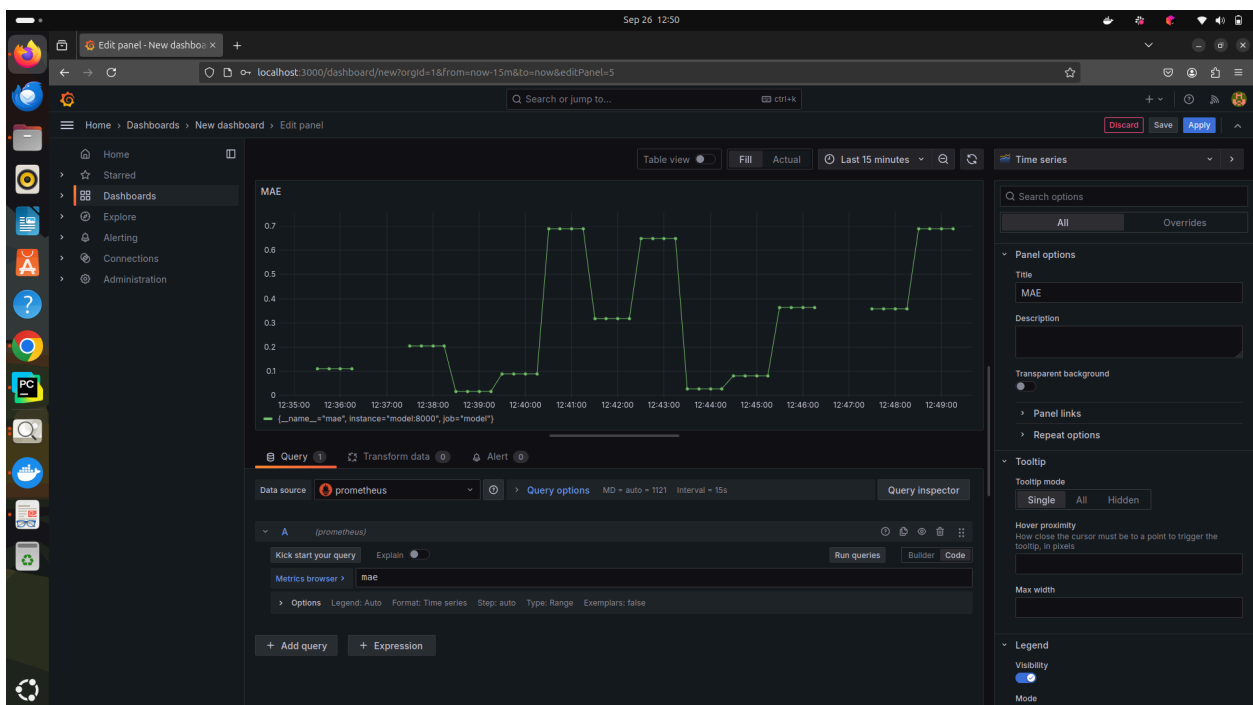


MAE and MAPE metrics added to application, console logs, and grafana. Add time series visualizations to your Grafana dashboard for MAE/MAPE in addition to the original train/test and Anomaly count series – should have a total of 5 time series in your final dashboard. Run the future forecasts for enough iterations to show appropriate trends in these metrics.

MAPE



MAE



All the graphs put together below showing the visual dashboard.

