Historical Database for DynaMIT2.0

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Outline

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Starting point

The aim of the on–line calibration is to use the off–line calibrated parameter values as starting points and perform a local optimization step towards the unobserved true values[1].

Precise historical OD flow $=>$ Accurate estimated OD-flow

[1] Constantinos,A(2004) On–line Calibration for Dynamic Traffic Assignment

OD-Flow Analysis

Altered by many factors:

- rush hour
- weather
- holiday
- ...

Needs to be stratified under several tags

Insights

- Set up database for storage
- Update historical data with estimated data
- Provide best-fit historical flow

Goal

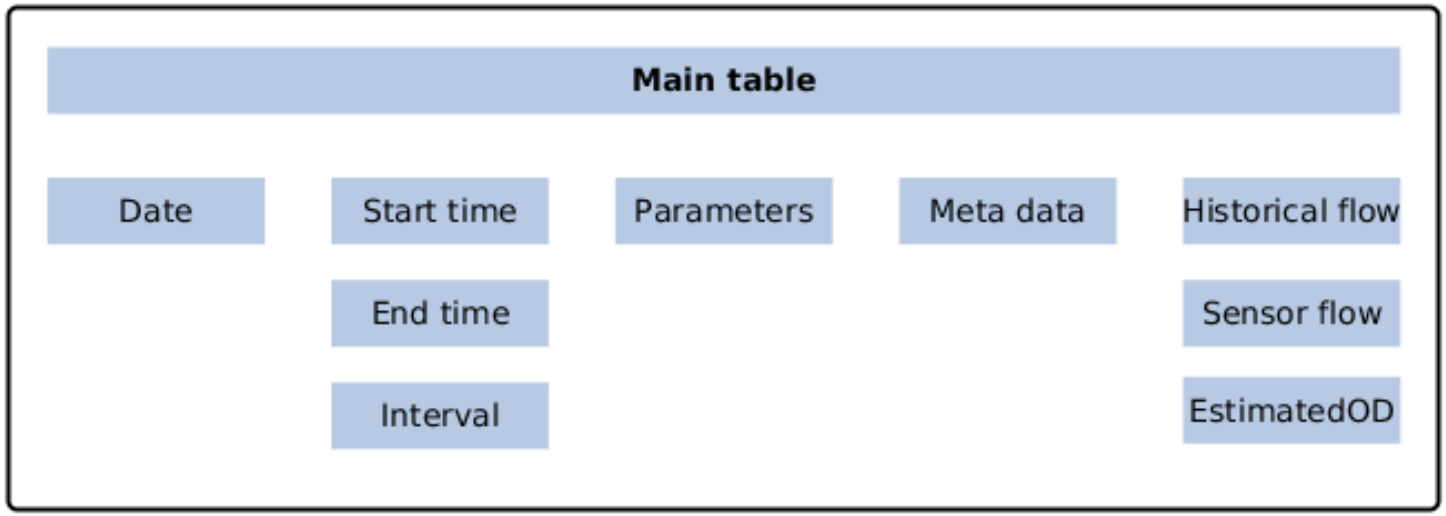
To design a program that can automatically **save** results from the DynaMIT simulation ,**update** the historical OD-flow and **render** proper demand input for the real-time DynaMIT simulation.

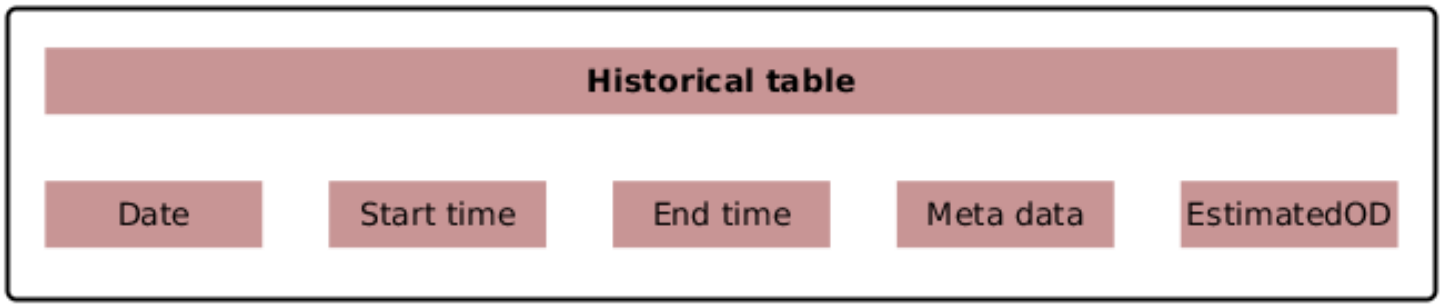
Outline

Functions

- Save DynaMIT input and output files to database
- Update the exist records in database
- Render best-fit historical data given by the input parameters of real-time DynaMIT simulation
- Auto-check and backup

Table definition





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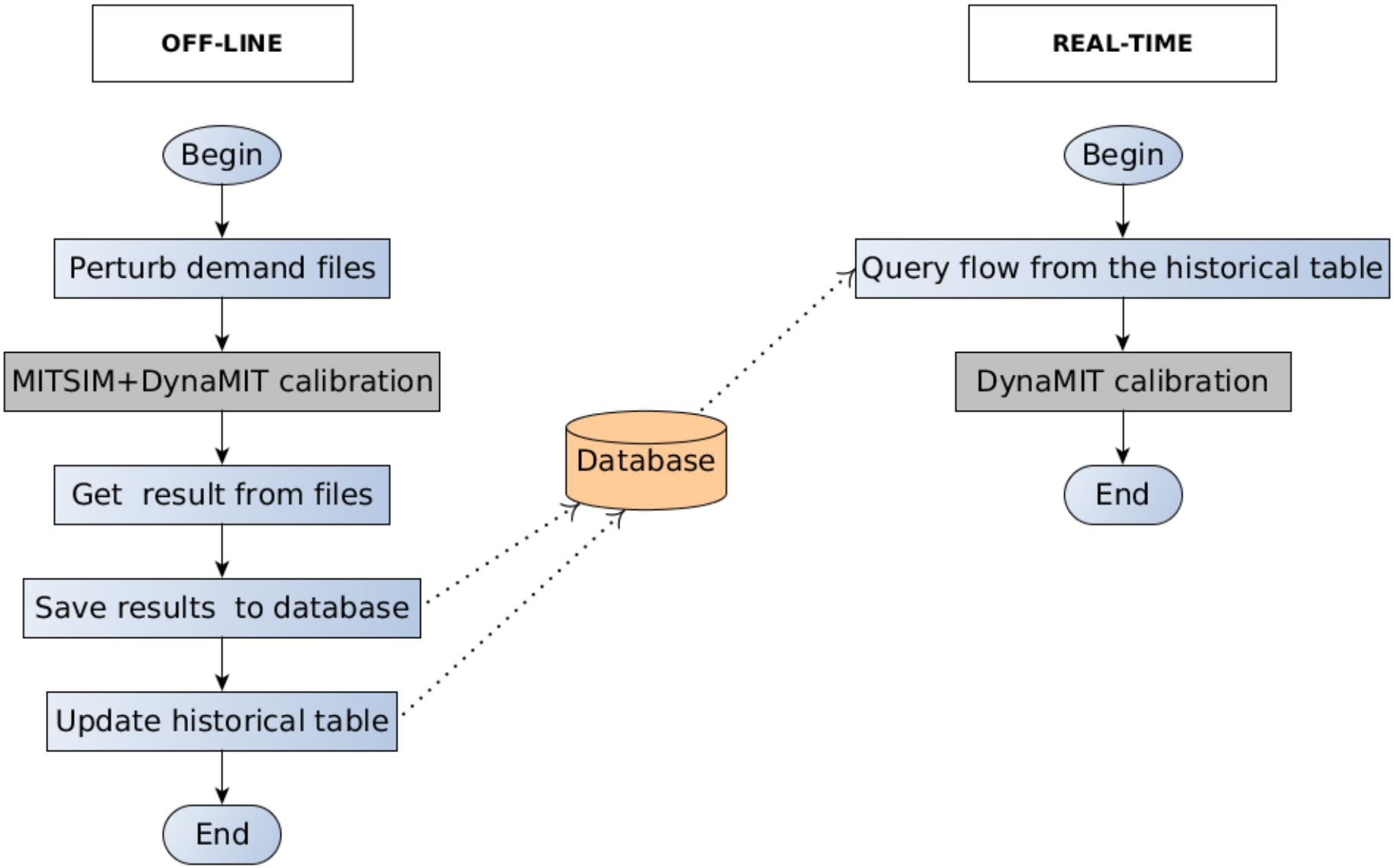
Flow Diagram



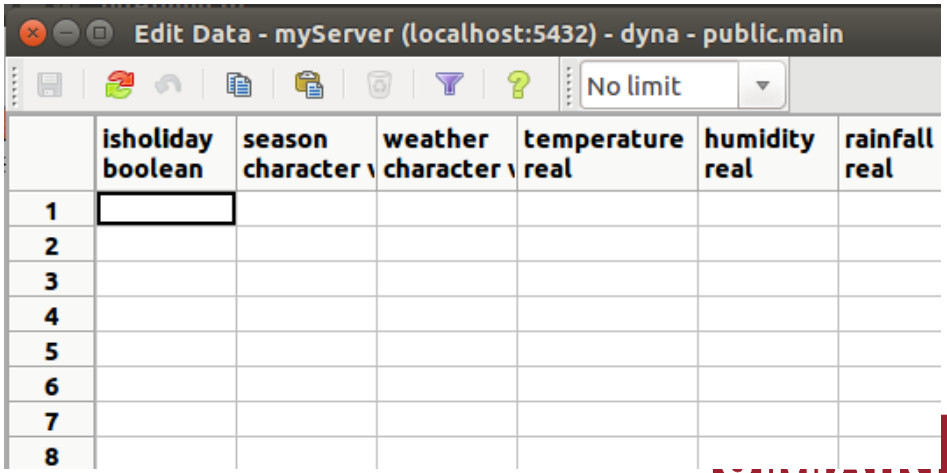
Project description

- Database: PostgreSQL
- Language:
  - Python (file operation)
  - Java (database I/D/U/Q)
  - Shell (whole process)

Setup process

- CREATE TABLE: database.config
- Framework parameter: params.config & init.sh
- Generate demands: demand_perturb.py

```
//Metadata(Tags)
Column= "isHoliday"      Type = "boolean"
Column= "season"                Type = "varchar(1000)"
Column= "weather"               Type = "varchar(1000)"
Column= "temperature"           Type = "real"
Column= "humidity"              Type = "real"
Column= "rainfall"              Type = "real"
Column= "wind"                  Type = "real"
Column= "incidents"             Type = "varchar(10000)"
Column= "specialEvent"          Type = "varchar(10000)"
Column= "description"           Type = "varchar(10000)"
```



Insert process(main table)

- dtaparam.dat
- behavior.dat
- supplyparam.dat
- sensor.out
- demand.dat
- estimatedOD*
- EOD.txt
- sen_flw_*
- sen_spd_*
- ...

Update process(hod table)

main::estimatedOD => hod::historicalOD

- Last EstimatedOD
- Moving Average(SMA,EMA)
- Smoothing Model

Generate historical data process

SELECT estimatedOD FROM hod WHERE ...

Screen-shot(Start)

```
dynamit@DynaMIT-WS: ~/student/mengyue/drill/test
==============================OcSimu2Db_Platform==============================
============================================================MENG YUE==August 3,2016=



Conversion from '/home/dynamit/student/mengyue/drill/test/DynaMIT/demand_DynaMIT
_hist_nZero_pert_Gaussian_BN5.dat' to '/home/dynamit/student/mengyue/drill/test/
DynaMIT/demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.csv' success!



histFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
demandFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
Preparation finished, start loop...


LOOP1|=>SIMUDATE: 2016/08/10
Connecting to database...
Database connected.
Searching date 2016/08/10


Clear backup...
=== mv output/temp files after run of DynaMIT in current directory to destinatio
n ===

use default= ./BACKUP
./BACKUP exsited
mv: cannot stat ‘log*’: No such file or directory
rm: cannot remove ‘algParams_*00.mat’: No such file or directory
Done.


Run DynaMIT&MITSIM...
****   DynaMIT Real-time and Closed-Loop version 2.1.0  ****
```

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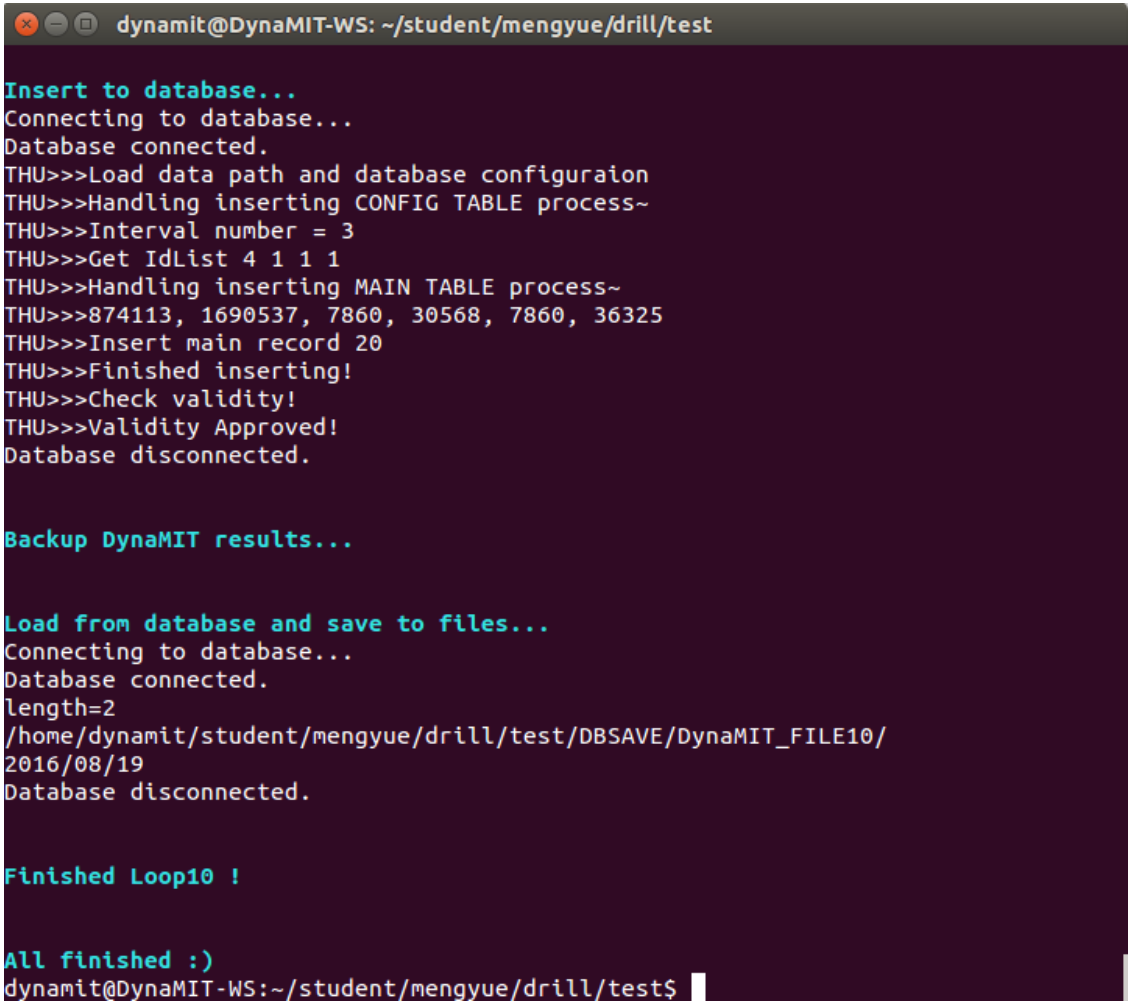
Screen-shot(End)



Screen-shot(Error)

Check for conflict primary key DATE

```
histFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
demandFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
Preparation finished, start loop...


LOOP1|=>SIMUDATE: 2016/08/10
Connecting to database...
Database connected.
Searching date 2016/08/10

[ERROR]:The date is already exist, abort this simulation and go next loop


LOOP2|=>SIMUDATE: 2016/08/11
Connecting to database...
Database connected.
Searching date 2016/08/11

[ERROR]:The date is already exist, abort this simulation and go next loop
```

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Outline

Test

- 17:00-17:20,10 DAYS,1633 OD-pairs
- using different update algorithm()
- examined by difference output by MITSIM

Result

Outline

Conclusion

- Run simulation and recording automatically
- Easy to debug and add new tags for database
- Potential value

Outline

Future work

- Find source for the metadata
- Use XXX algorithm for "update process"
- Use XXX algorithm for "render historical data"
- Refactoring & Documentation

Question

Any questions?

Thank you!