2025-06-20

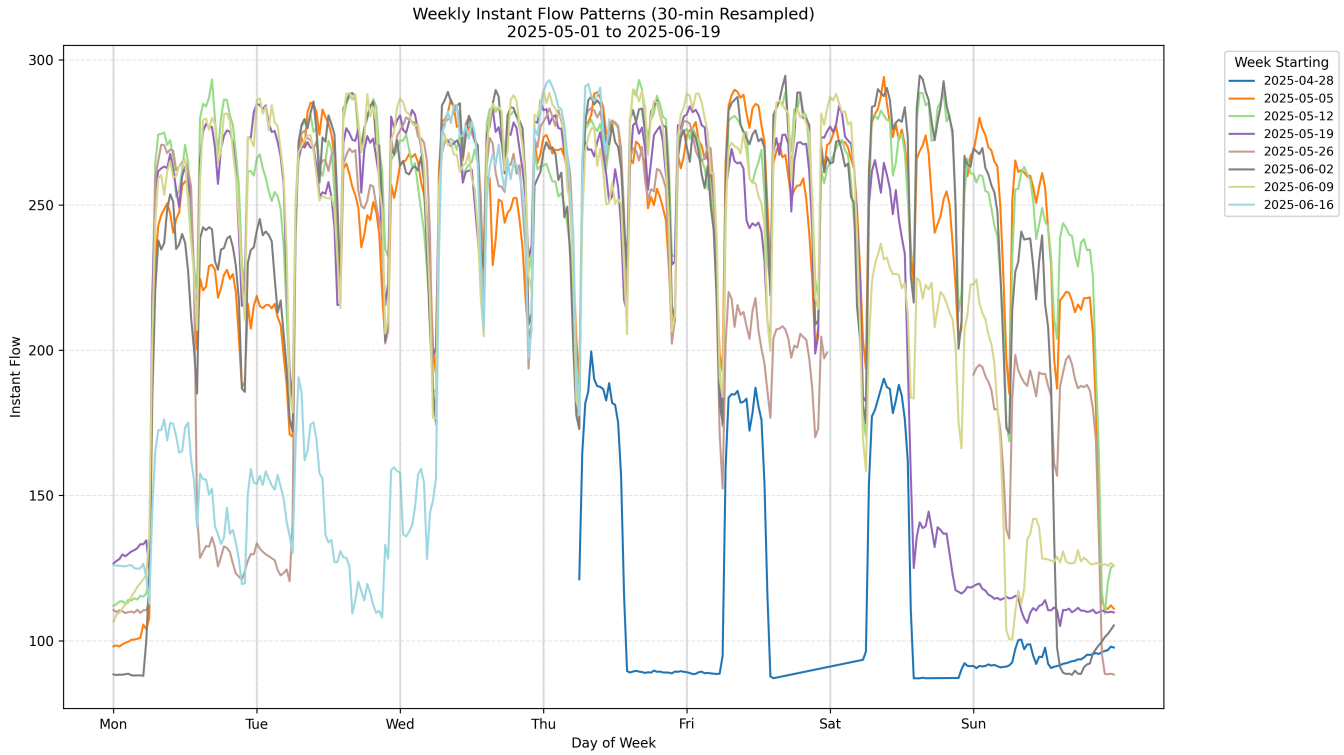
设计思路

- [ ] 先绘制每一周的时序图，看下每周的整体情况
- [ ] 看下能否分段训练
- [ ] 加入计划机制，
  - [ ] 停产计划：输入指定停产时段，可以将这段的预测结果设置为一个固定值
  - [ ] 减产计划：
  - [ ] 正常计划：那就采用模型预测
- [ ] 加入星期机制：
  - [ ] 星期一：模型1
  - [ ] 星期日：模型2
  - [ ] 其他： 模型3

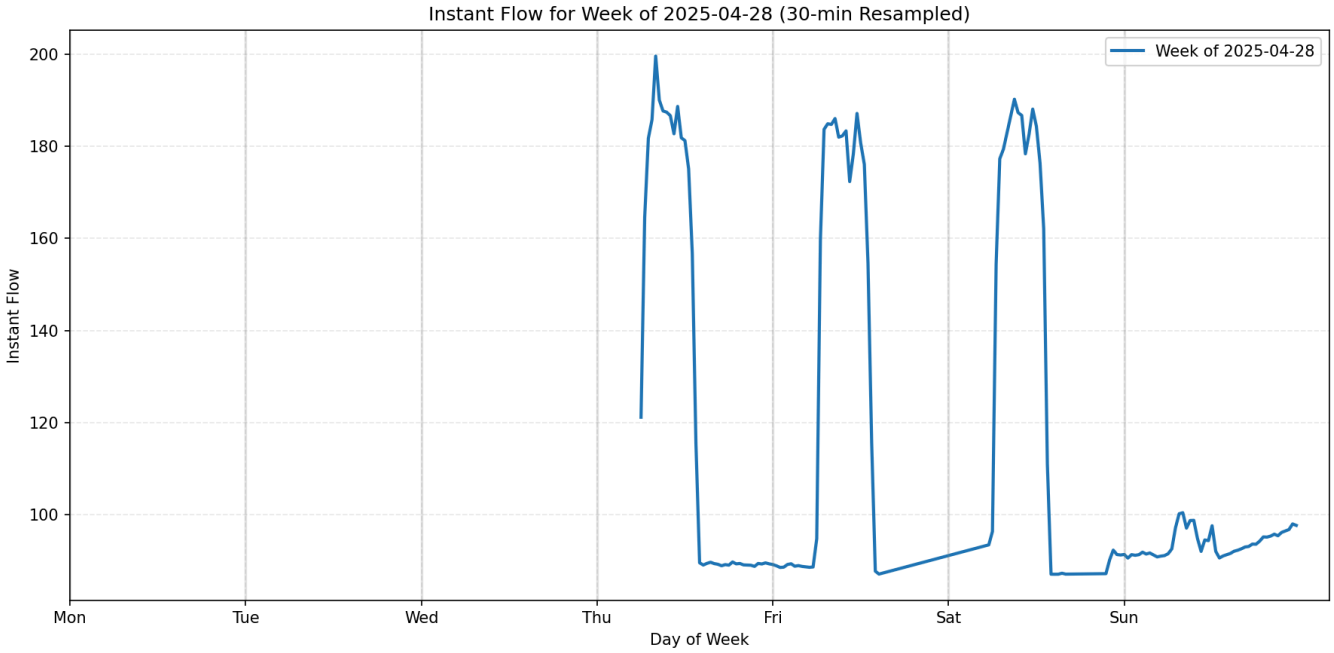
1.停产:(7) = T
2.满产:(1~6) = M

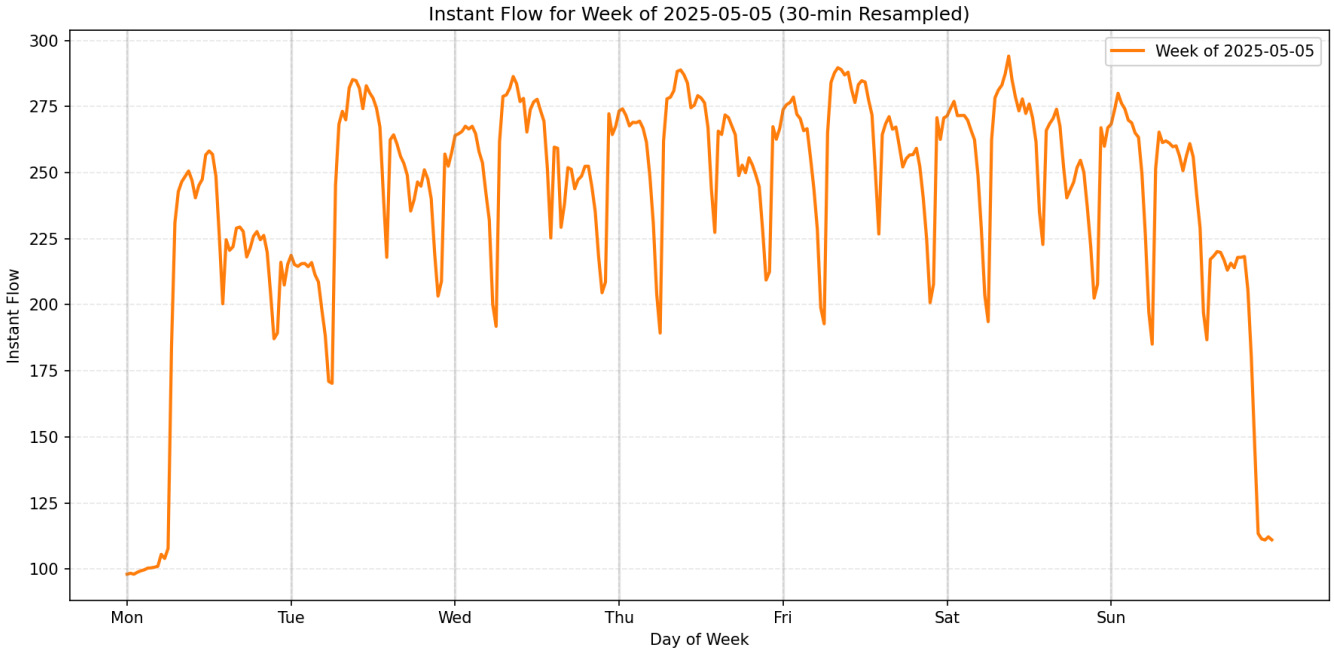
通用所有项目！

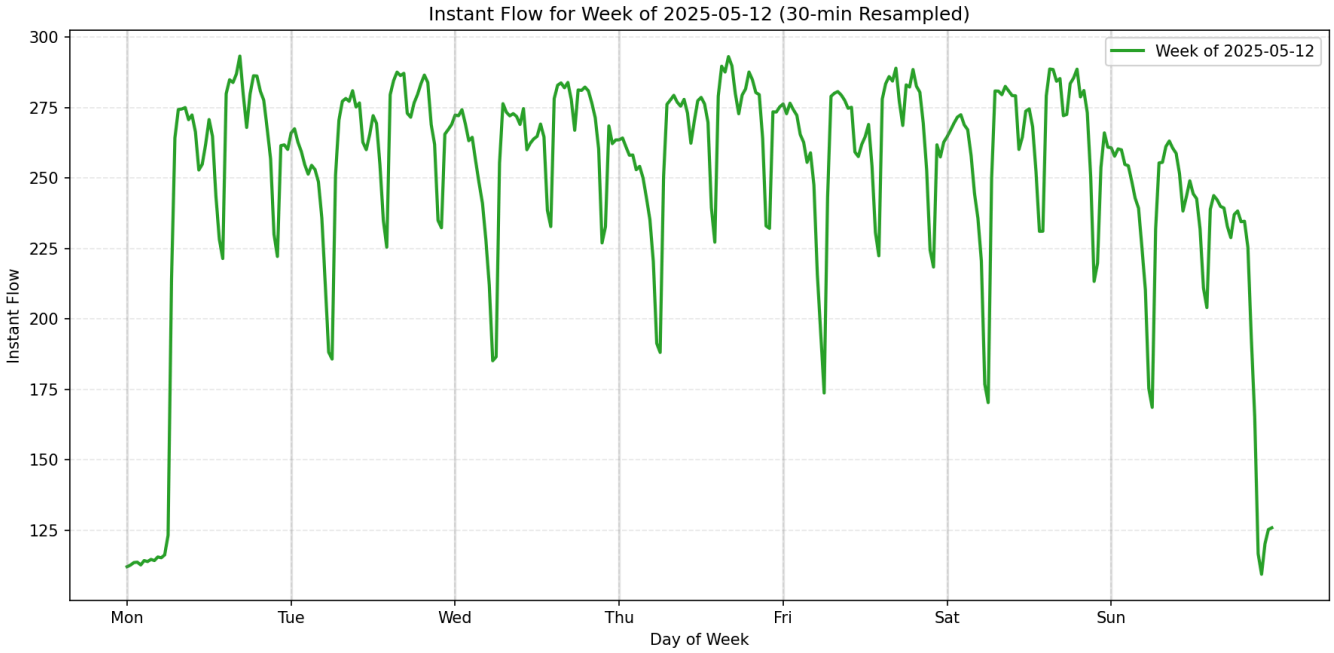
从5月1日到6月19日，以周为单位绘制时序图

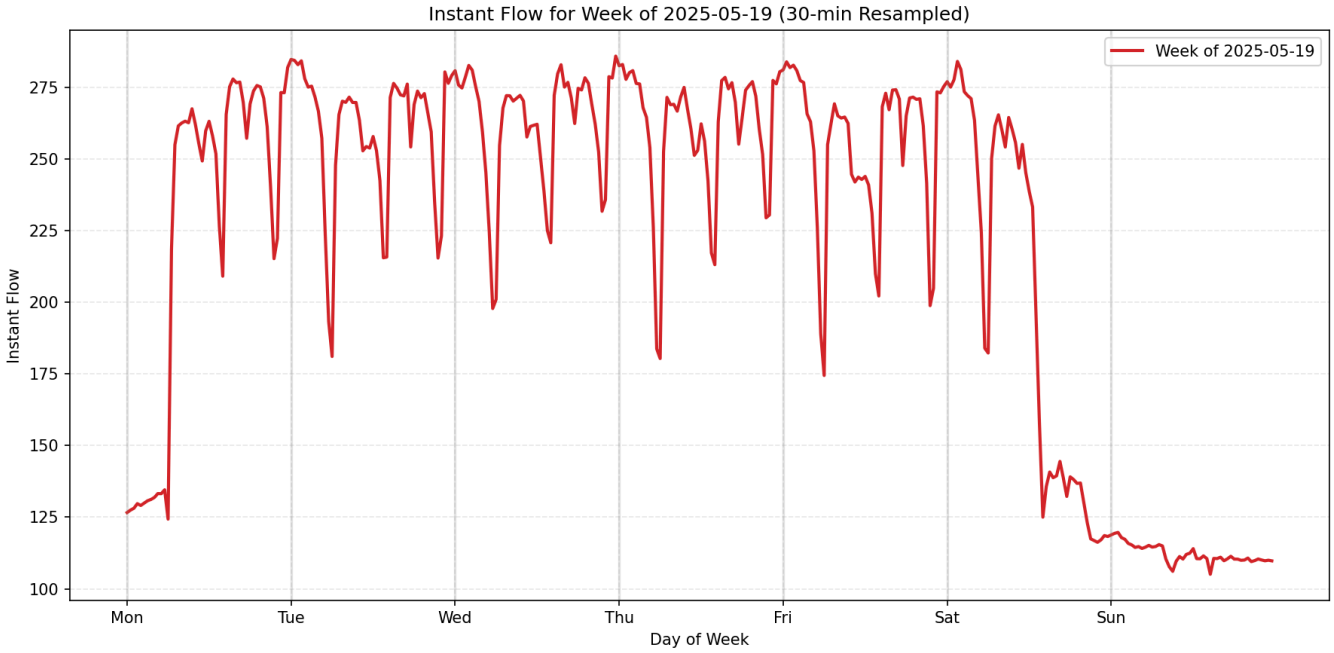


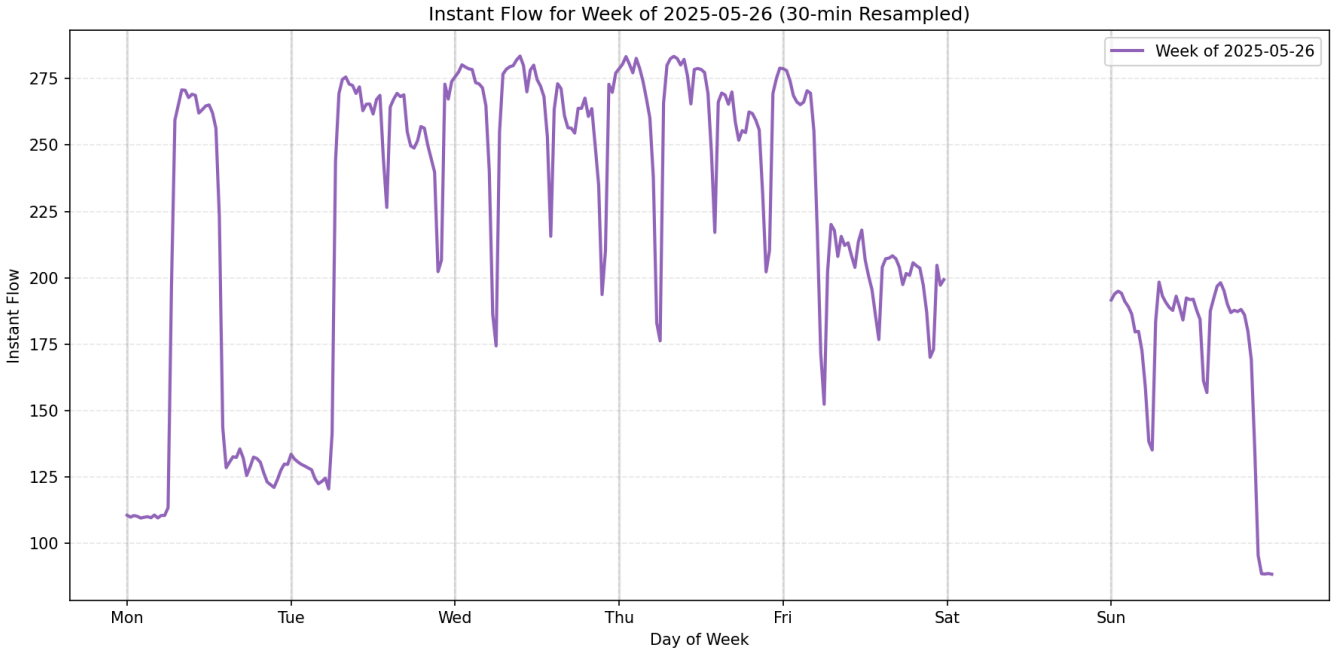
具体每周的时序图如下：

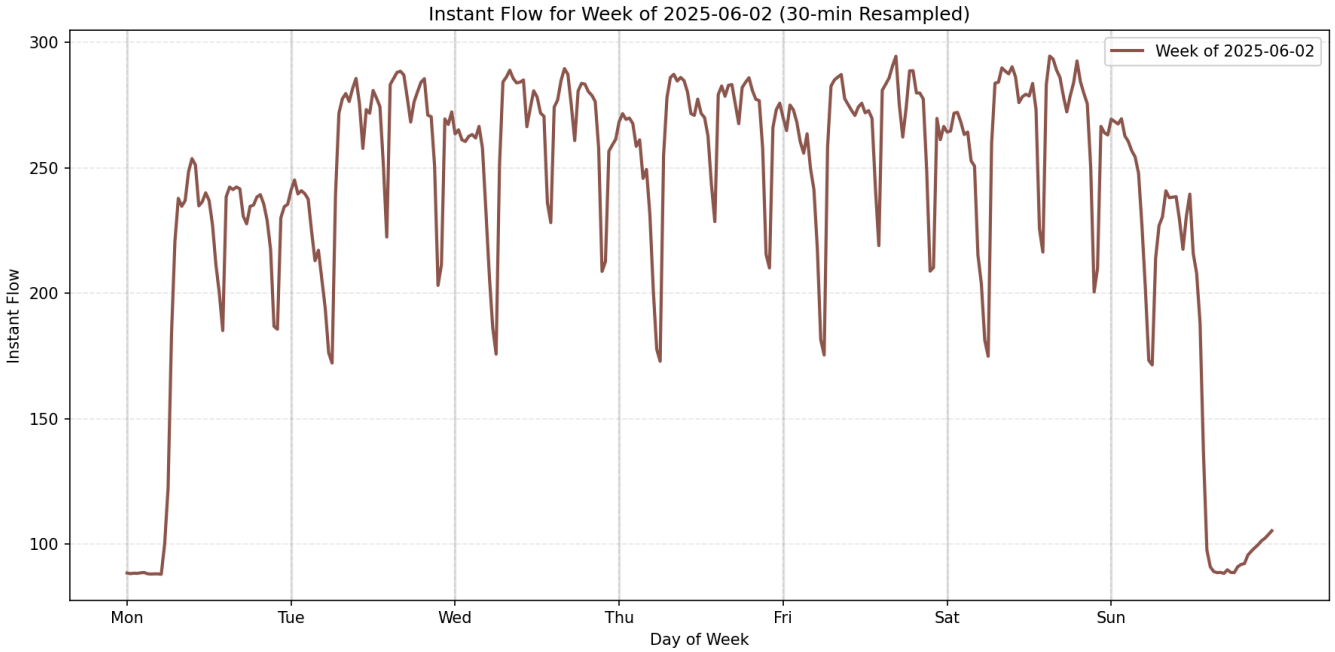

Instant Flow for Week of 2025-04-28 (30-min Resampled)
Week of 2025-04-28
Instant Flow
200
180
160
140
120
100
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Day of Week

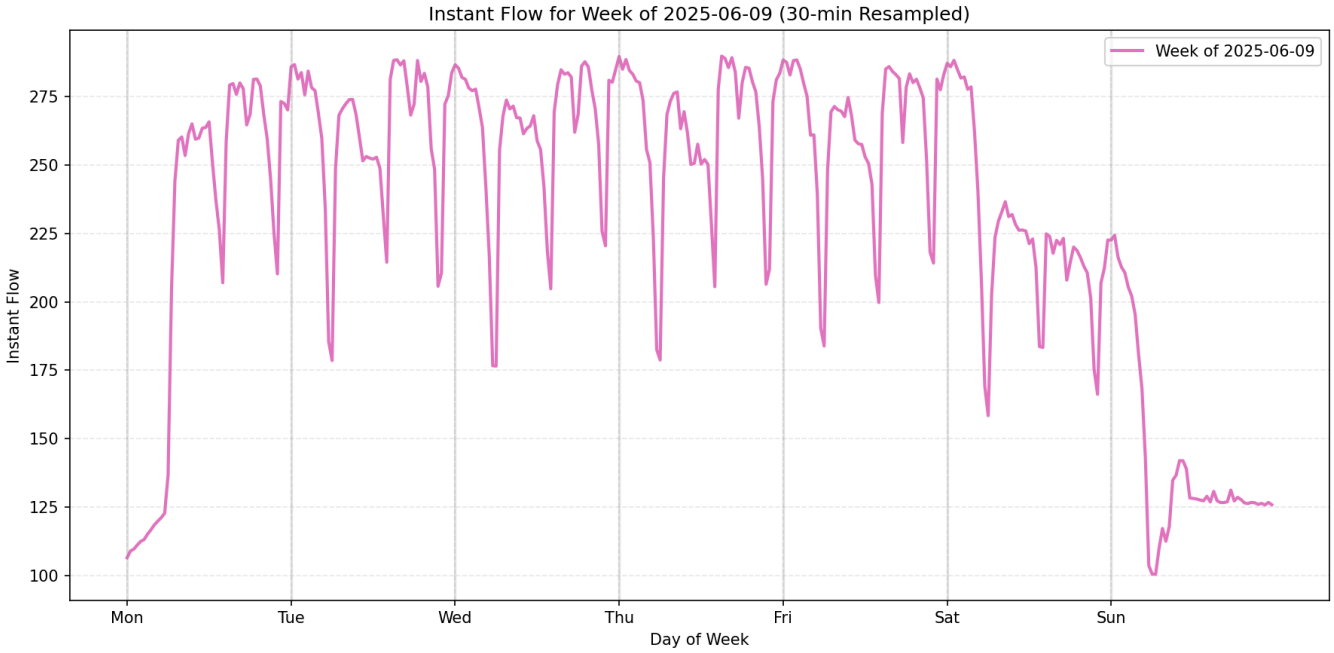

Instant Flow for Week of 2025-05-05 (30-min Resampled)
Week of 2025-05-05
Instant Flow
300
275
250
225
200
175
150
125
100
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Day of Week

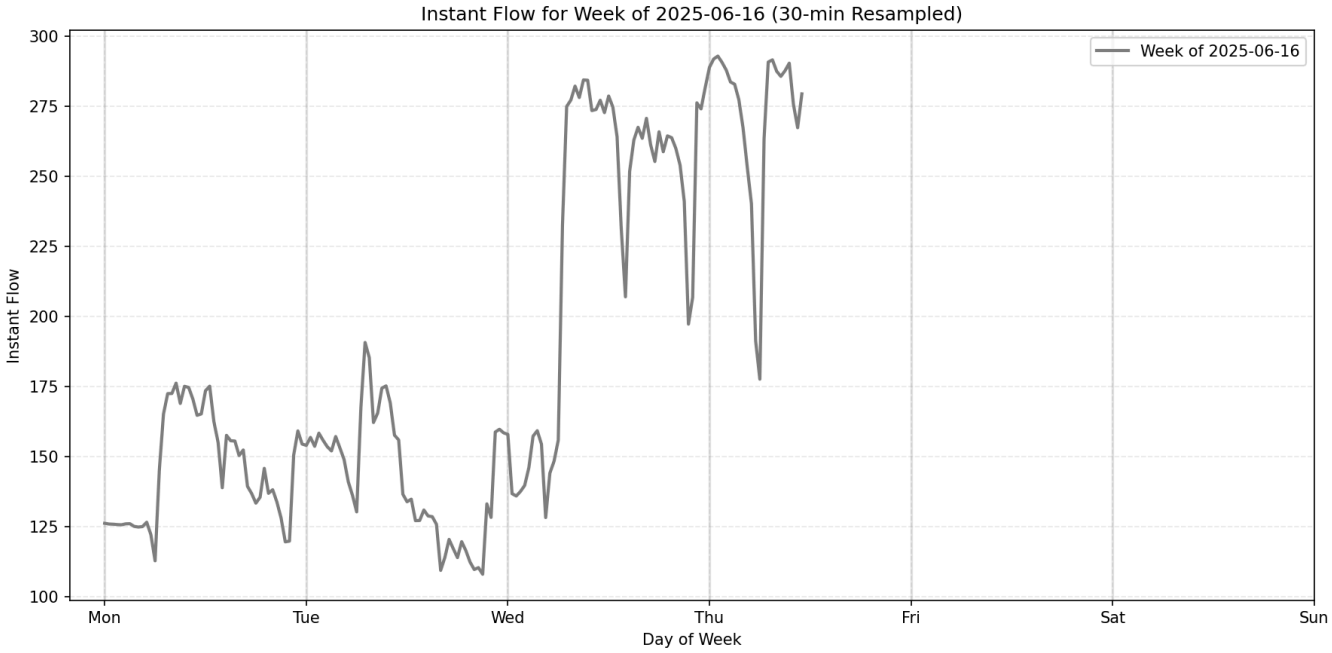

Instant Flow for Week of 2025-05-12 (30-min Resampled)
Week of 2025-05-12
Instant Flow
300
275
250
225
200
175
150
125
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Day of Week


Instant Flow for Week of 2025-05-19 (30-min Resampled)
Week of 2025-05-19
Instant Flow
275
250
225
200
175
150
125
100
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Day of Week


Instant Flow for Week of 2025-05-26 (30-min Resampled)
Week of 2025-05-26
Instant Flow
275
250
225
200
175
150
125
100
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Day of Week


Instant Flow for Week of 2025-06-02 (30-min Resampled)
Week of 2025-06-02
Instant Flow
300
250
200
150
100
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Day of Week



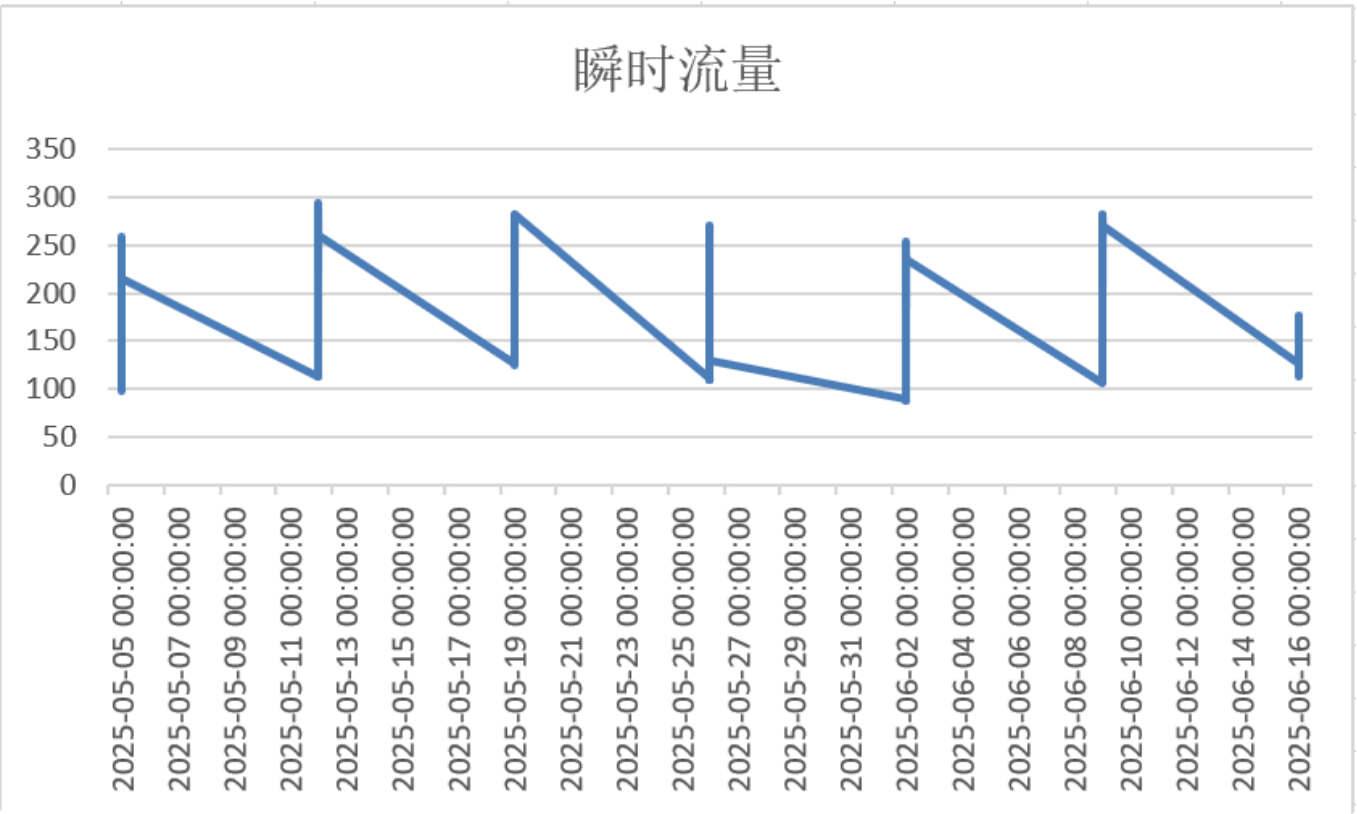


结论：

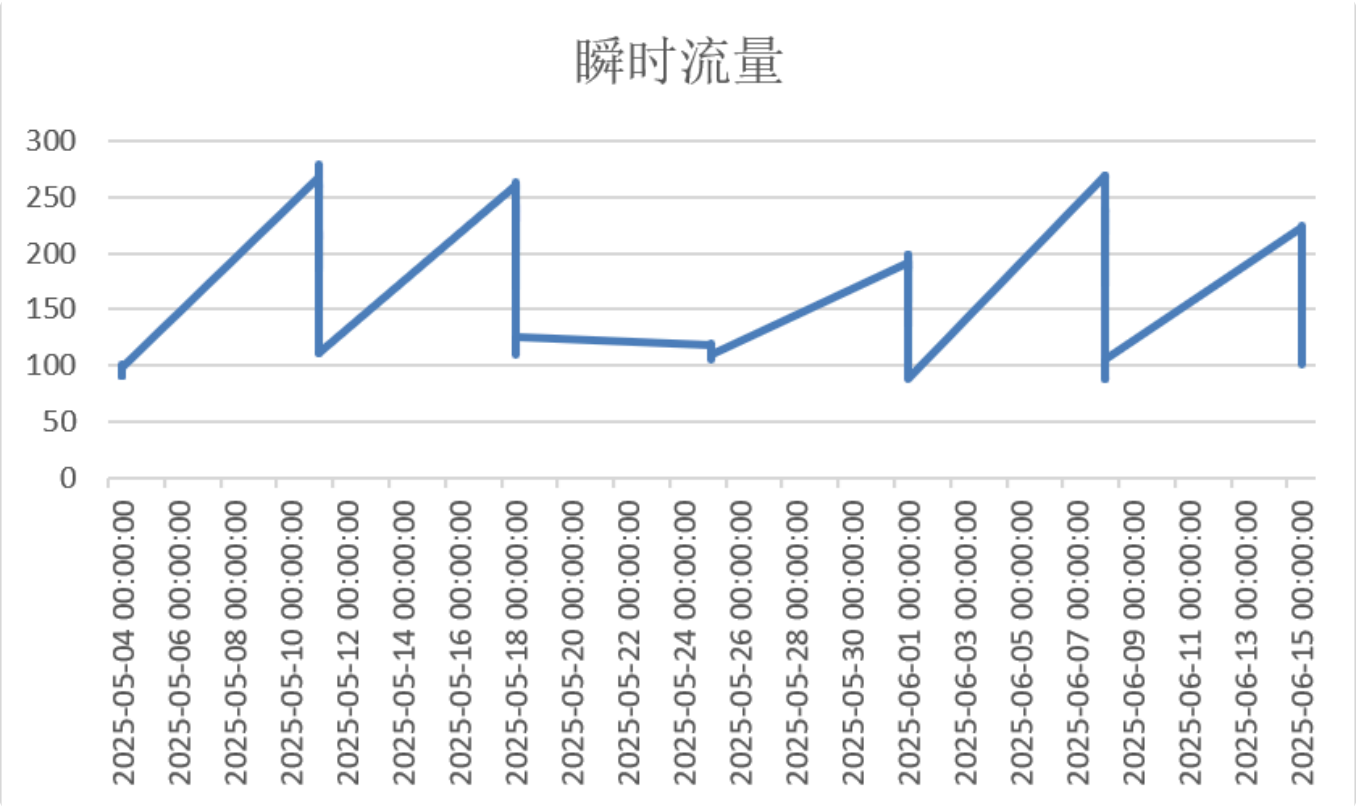
- 周一数据具有单独的规律
- 周日数据具有单独的规律
-

单独提取周一和周日的数据

提取周一数据

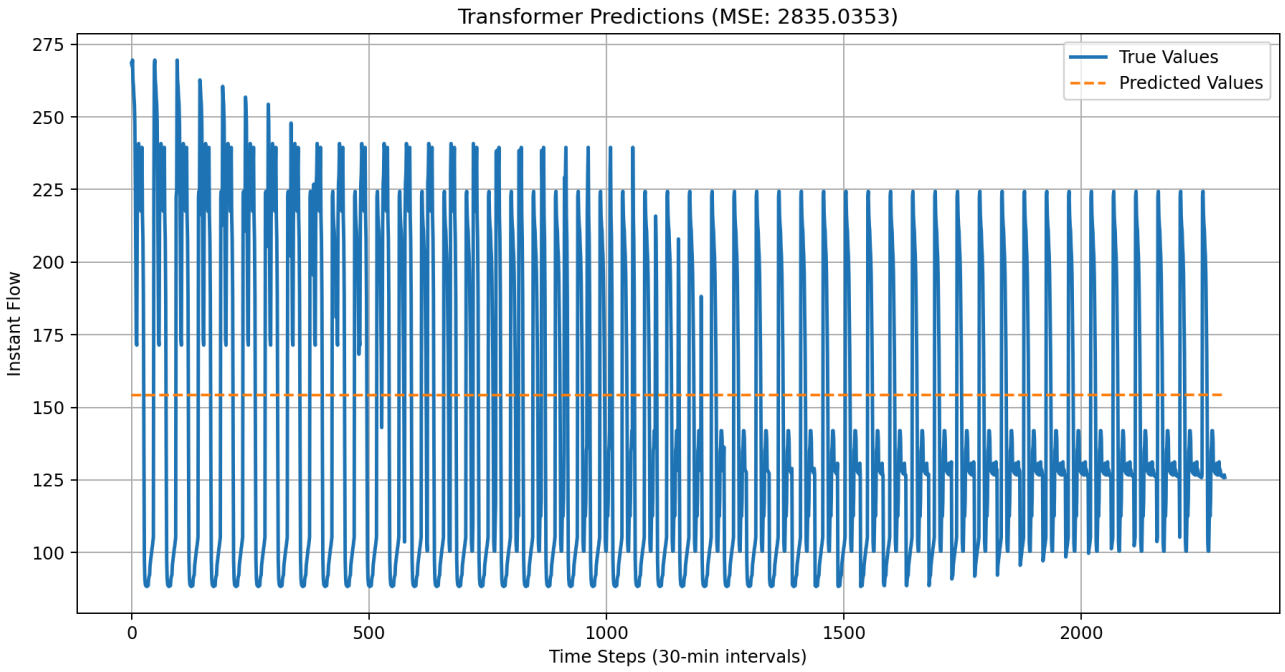


提取周日数据



Transformer

模型已保存，测试MSE: 2835.0353

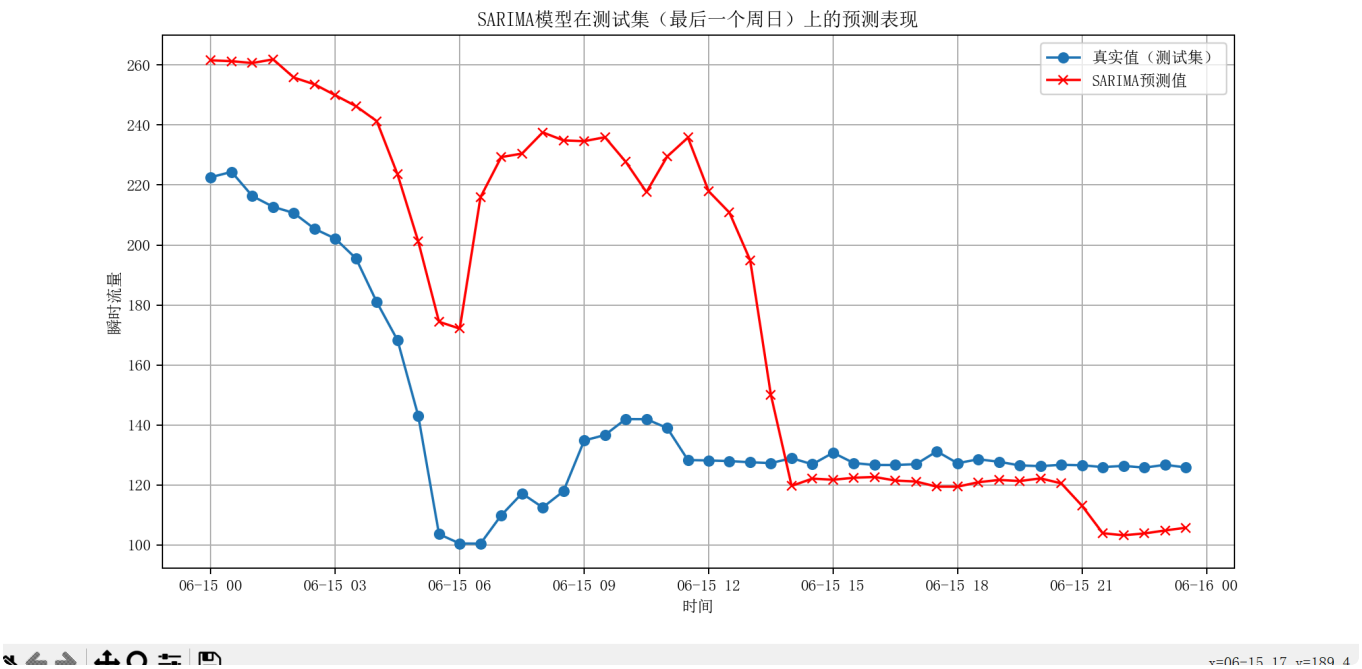


随机森林

最优超参数:
n_estimators: 200
min_samples_split: 2
min_samples_leaf: 2
max_features: 0.8
max_depth: 30
bootstrap: True

SARIMIA

测试集MSE：3797.0156



部署

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├── main.py # 主入口文件
├── model_predictor.py # 模型预测器（核心功能）
├── data_utils.py # 数据获取工具
└── schemas.py # Pydantic 模型

流量预测

http://localhost:8001/predict_flow

Request URL

```
http://localhost:8001/predict_flow
```

Server response

Code	Details
200	Response body


```
[
  {
    "timestamp": "2025-06-21T00:00:00",
    "forecast": 290.4795649089736,
    "lower_bound": 243.24160771718218,
    "upper_bound": 337.71752210076505,
    "metric": "瞬时流量",
    "model_type": "workday"
  },
  {
    "timestamp": "2025-06-21T00:01:00",
    "forecast": 291.03221707260616,
    "lower_bound": 243.05870268398252,
    "upper_bound": 339.0057314612298,
    "metric": "瞬时流量",
    "model_type": "workday"
  },
  {
    "timestamp": "2025-06-21T00:02:00",
    "forecast": 291.5848692362387,
    "lower_bound": 242.87579765078283,
    "upper_bound": 340.2939408216946,
    "metric": "瞬时流量",
    "model_type": "workday"
  },
  {
    "timestamp": "2025-06-21T00:03:00",
    "forecast": 292.1375213998713,
    "lower_bound": 242.69289261758317,
```


Download

压力预测

http://localhost:8001/predict_pressure

Code	Details
200	Response body


```
[
  {
    "timestamp": "2025-06-21T00:00:00",
    "forecast": 5.879870664424073,
    "lower_bound": 5.514016164905095,
    "upper_bound": 6.24572516394305,
    "metric": "总压力"
  },
  {
    "timestamp": "2025-06-21T00:01:00",
    "forecast": 5.879366353246578,
    "lower_bound": 5.507515687240629,
    "upper_bound": 6.251217019252528,
    "metric": "总压力"
  },
  {
    "timestamp": "2025-06-21T00:02:00",
    "forecast": 5.878862042069083,
    "lower_bound": 5.5010152095761615,
    "upper_bound": 6.256708874562006,
    "metric": "总压力"
  },
  {
    "timestamp": "2025-06-21T00:03:00",
    "forecast": 5.878357730891589,
    "lower_bound": 5.494514731911695,
    "upper_bound": 6.262200729871482,
```


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