

5-D-EX-SUS

October 31, 2017

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In [1]: from utility import db_connect, query2csv
        from settings import DBNAME, DBPASS, DBUSER, DBHOST
```

```
In [2]: qsql="""
        with d as (
            select generate_series(0,6) as dayofweek
        ),
        m as (
            select generate_series(1,12) as month
        ),
        V_jmyl as (
            select
                baadv.analysis_area_id,
                to_char(baadv.date, 'YYYY') as year,
                avg(baadv.volume)::bigint as volume_i,
                avg(baadv.volume) as volume,
                d.dayofweek,
                m.month
            from
                baa_ex_sus.analysis_areas_daily_volume as baadv,
                d,
                m
            where
                extract(dow from baadv.date) in (d.dayofweek)
                AND date_part('month', baadv.date) = m.month
            group by baadv.analysis_area_id, year, d.dayofweek, m.month
        ),
        madt as (
            select
                month,
                year,
                analysis_area_id,
                avg(volume)::bigint as volume_i,
                avg(volume) as volume
            from
                v_jmyl
            group by analysis_area_id, year, month
            having count(dayofweek)=7 -- having 7 days of data each week
```

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),
aadt as (
select
    analysis_area_id,
    year,
    avg(volume)::bigint as AADT_i,
    round(avg(volume), 2) as AADT
from madt
    group by analysis_area_id, year
    having count(month) = 12 -- having 12 months of data
),
-- daily_exclude_holiday: daily counts for sites excluding holidays
daily_exclude_holiday as (
select
    baaad.analysis_area_id,
    baaad.date,
    baaad.volume,
    date_part('month', baaad.date) as month,
    date_part('dow', baaad.date) as dow
from
    baa_ex_sus.analysis_areas_daily_volume as baaad
    left join baa.holidays as baahd on baaad.date::date = baahd.holiday_date
where
    baahd.holiday_id is null
    group by 1,2,3
),
V_jmyl_exclude_holiday as (
select
    baadv.analysis_area_id,
    to_char(baadv.date, 'YYYY') as year,
    avg(baadv.volume) as volume,
    d.dayofweek,
    m.month
from
    daily_exclude_holiday as baadv,
    d,
    m
where
    extract(dow from baadv.date) in (d.dayofweek)
    AND date_part('month', baadv.date) = m.month
    group by baadv.analysis_area_id, year, d.dayofweek, m.month
),
mادت_exclude_holiday as (
select
    month,
    year,
    analysis_area_id,
    avg(volume) as madt

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        from
            V_jmyl_exclude_holiday
            group by analysis_area_id, year, month
            having count(dayofweek)=7 -- having 7 days of data each week
    ),
    fm as (
    select
        madt_nh.analysis_area_id,
        madt_nh.month,
        madt_nh.year,
        round(madt_nh.madt/aadt.aadt::numeric,2) as fm
    from
        madt_exclude_holiday as madt_nh inner join aadt using(analysis_area_id, year, month)
    where
        aadt.aadt <> 0
    ),
    -- fm_est: monthly factor average for the trial analysis group
    fm_est as (
        select
            fg_cmt.city,
            fg_cmt.mode,
            fg_cmt.analysis_area_test_id,
            fm.year,
            fm.month,
            round(avg(fm.fm), 2) as fm_est,
            fg_cmt.random_trial_analysis_area_id_list
        from
            fm inner join baa_ex_sus.fg_city_mode_random_test as fg_cmt
            on fm.analysis_area_id = Any(fg_cmt.random_trial_analysis_area_id_list)
            group by 1,2,3,4,5,7
    ),
    wkstart as (
    select
        baaad.analysis_area_id,
        date_trunc('week', baaad.date) AS week_start,
        to_char(baaad.date, 'YYYY') as year
    from
        baa_ex_sus.analysis_areas_daily_volume as baaad
        left join baa.holidays as baahd on baaad.date::date = baahd.holiday_date
    where
        baahd.holiday_id is null
        group by 1,2,3
        having count(baaad.date)=7
    ),
    -- daily_no_holiday: daily counts for sites excluding a week with any holiday
    daily_no_holiday as (
    select
        baaad.analysis_area_id,

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    baaad.date,
    baaad.volume,
    date_part('month', baaad.date) as month,
    se.year,
    date_part('dow', baaad.date) as dow
from
    baa_ex_sus.analysis_areas_daily_volume as baaad
    inner join wkstart as se using (analysis_area_id)
where
    baaad.date <= se.week_start + interval '6' day
    and baaad.date >=se.week_start
    order by baaad.analysis_area_id, baaad.date
),
-- Vw_site: weekly volume count average for each site excluding holiday week
Vw_site as (
select
    analysis_area_id,
    date_trunc('week', date) as monday,
    date_part('month', date_trunc('week', date)) as month,
    year,
    round(avg(volume), 2) as Vw
from daily_no_holiday
group by 1,2,3,4
),
-- fm_aadb_est: Estimate AADB for that week for that trial analysis area =
fm_aadb_est as (
select
    fm_est.city,
    fm_est.mode,
    fm_est.analysis_area_test_id,
    Vw_site.monday,
    Vw_site.month,
    Vw_site.year,
    Vw_site.vw,
    fm_est.fm_est,
    round(Vw_site.vw/fm_est.fm_est, 2) as fm_aadb_est,
    fm_est.random_trial_analysis_area_id_list
from
    fm_est, Vw_site
where
    fm_est.analysis_area_test_id = Vw_site.analysis_area_id
    and fm_est.year=Vw_site.year
    and fm_est.month = Vw_site.month
    and fm_est.fm_est <> 0
)
select * from fm_aadb_est
order by 3,6,5,4
"""

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csvfile='5-D-fm_aadb_est_ex_sus.csv'
query2csv(qsql,csvfile)
```

<IPython.core.display.HTML object>

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In [3]: qsql="""
with d as (
    select generate_series(0,6) as dayofweek
),
m as (
    select generate_series(1,12) as month
),
V_jmyl as (
    select
        baadv.analysis_area_id,
        to_char(baadv.date, 'YYYY') as year,
        avg(baadv.volume)::bigint as volume_i,
        avg(baadv.volume) as volume,
        d.dayofweek,
        m.month
    from
        baa_ex_sus.analysis_areas_daily_volume as baadv,
        d,
        m
    where
        extract(dow from baadv.date) in (d.dayofweek)
        AND date_part('month', baadv.date) = m.month
        group by baadv.analysis_area_id, year, d.dayofweek, m.month
),
madt as (
    select
        month,
        year,
        analysis_area_id,
        avg(volume)::bigint as volume_i,
        avg(volume) as volume
    from
        v_jmyl
        group by analysis_area_id, year, month
        having count(dayofweek)=7 -- having 7 days of data each week
),
aadt as (
select
    analysis_area_id,
    year,
    avg(volume)::bigint as AADT_i,
    round(avg(volume), 2) as AADT
```

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from madt
  group by analysis_area_id, year
  having count(month) = 12 -- having 12 months of data
),
-- daily_exclude_holiday: daily counts for sites excluding holidays
daily_exclude_holiday as (
select
  baaad.analysis_area_id,
  baaad.date,
  baaad.volume,
  date_part('month', baaad.date) as month,
  date_part('dow', baaad.date) as dow
from
  baa_ex_sus.analysis_areas_daily_volume as baaad
  left join baa.holidays as baahd on baaad.date::date = baahd.holiday_date
where
  baahd.holiday_id is null
  group by 1,2,3
),
V_jmyl_exclude_holiday as (
  select
    baadv.analysis_area_id,
    to_char(baadv.date, 'YYYY') as year,
    avg(baadv.volume) as volume,
    d.dayofweek,
    m.month
  from
    daily_exclude_holiday as baadv,
    d,
    m
  where
    extract(dow from baadv.date) in (d.dayofweek)
    AND date_part('month', baadv.date) = m.month
    group by baadv.analysis_area_id, year, d.dayofweek, m.month
),
madt_exclude_holiday as (
  select
    month,
    year,
    analysis_area_id,
    avg(volume) as madt
  from
    V_jmyl_exclude_holiday
    group by analysis_area_id, year, month
    having count(dayofweek)=7 -- having 7 days of data each week
),
fm as (
select

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```

        madt_nh.analysis_area_id,
        madt_nh.month,
        madt_nh.year,
        round(madt_nh.madt/aadt.aadt::numeric,2) as fm
from
    madt_exclude_holiday as madt_nh inner join aadt using(analysis_area_id, year)
where
    aadt.aadt <> 0
),
-- fm_est: monthly factor average for the trial analysis group
fm_est as (
    select
        fg_cmt.city,
        fg_cmt.mode,
        fg_cmt.analysis_area_test_id,
        fm.year,
        fm.month,
        round(avg(fm.fm), 2) as fm_est,
        fg_cmt.random_trial_analysis_area_id_list
    from
        fm inner join baa_ex_sus.fg_city_mode_random_test as fg_cmt
        on fm.analysis_area_id = Any(fg_cmt.random_trial_analysis_area_id_list)
        group by 1,2,3,4,5,7
),
wkstart as (
select
    baaad.analysis_area_id,
    date_trunc('week', baaad.date) AS week_start,
    to_char(baaad.date, 'YYYY') as year
from
    baa_ex_sus.analysis_areas_daily_volume as baaad
    left join baa.holidays as baahd on baaad.date::date = baahd.holiday_date
where
    baahd.holiday_id is null
    group by 1,2,3
    having count(baaad.date)=7
),
-- daily_no_holiday: daily counts for sites excluding a week with any holiday
daily_no_holiday as (
select
    baaad.analysis_area_id,
    baaad.date,
    baaad.volume,
    date_part('month', baaad.date) as month,
    se.year,
    date_part('dow', baaad.date) as dow
from
    baa_ex_sus.analysis_areas_daily_volume as baaad

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```

        inner join wkstart as se using (analysis_area_id)
where
    baaad.date <= se.week_start + interval '6' day
    and baaad.date >=se.week_start
    order by baaad.analysis_area_id, baaad.date
),
-- Vw_site: weekly volume count average for each site excluding holiday week
Vw_site as (
select
    analysis_area_id,
    date_trunc('week', date) as monday,
    date_part('month', date_trunc('week', date)) as month,
    year,
    round(avg(volume), 2) as Vw
from daily_no_holiday
group by 1,2,3,4
),
-- fm_aadb_est: Estimate AADB for that week for that trial analysis area =
fm_aadb_est as (
select
    fm_est.city,
    fm_est.mode,
    fm_est.analysis_area_test_id ,
    Vw_site.monday,
    Vw_site.month,
    Vw_site.year,
    Vw_site.vw,
    fm_est.fm_est,
    round(Vw_site.vw/fm_est.fm_est, 2) as fm_aadb_est,
    fm_est.random_trial_analysis_area_id_list
from
    fm_est, Vw_site
where
    fm_est.analysis_area_test_id = Vw_site.analysis_area_id
    and fm_est.year=Vw_site.year
    and fm_est.month = Vw_site.month
    and fm_est.fm_est <> 0
)
-- compute error
select
    fae.*,
    round((fae.fm_aadb_est-aadt.aadt)/aadt.aadt::numeric, 2) as error
from
    fm_aadb_est as fae, aadt
where
    fae.analysis_area_test_id = aadt.analysis_area_id
    and fae.year = aadt.year
    and aadt.aadt <> 0

```



```
order by 1, 2, 3, 4, 6, 5
"""
csvfile='5-D-fm_aadb_error_ex_sus.csv'
query2csv(qsql, csvfile)

<IPython.core.display.HTML object>
```