MSAN 691 - Homework 4

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September 22, 2016

4.1 Linking Stocks to Fundamental Data

4.1.1

1

```
SELECT rev, netinc, cash
FROM stocks2016.fnd
WHERE conm = 'APPLE INC'
AND fyear = 2010;
```

rev	*netinc*	*cash*
65225	14013	11261

(1 row)

2

3

```
SELECT *
FROM stocks2016.d2010
WHERE lpad(cusip,8,'0') = (SELECT DISTINCT lpad(cusip,8,'0')
  FROM stocks2016.fnd
  WHERE conm = 'APPLE INC');
```

cusip	*permno*	*permco*	*issuno*	*hsic*	*retdate*	*bid*	*ask*
03783310	14593	7	8	3571	2010-01-04	212.38	214.5
03783310	14593	7	8	3571	2010-01-05	213.25	215.59
03783310	14593	7	8	3571	2010-01-06	210.75	215.23
03783310	14593	7	8	3571	2010-01-07	209.05	212
03783310	14593	7	8	3571	2010-01-08	209.06	212
...							

(252 rows)

4

```
SELECT *
FROM stocks2016.lnk
WHERE lpad(gvkey,6,'0') = (SELECT DISTINCT gvkey
  FROM stocks2016.fnd
  WHERE conm = 'APPLE INC')
AND linktype in ('LU', 'LC')
AND linkprim in ('P', 'C');
```

gvkey	*linkprim*	*liid*	*linktype*	*lpermno*	*lpermco*	*usedflag*	*linkdt*	*linkenddt*
1690	P	1	LU	14593	7	1	1980-12-12	E

(1 row)

5

```
SELECT *
FROM
(stocks2016.d2010) AS lhs
LEFT JOIN
(SELECT gvkey,
        liid,
        linkdt,
        CASE
          WHEN linkenddt = 'E' THEN now()::TEXT
          ELSE linkenddt
        END,
        linkprim,
        linktype,
        lpermco,
        lpermno,
        usedflag
  FROM stocks2016.lnk) AS rhs
ON lhs.permno = rhs.lpermno
  AND lhs.permco = rhs.lpermco
  AND date_part('epoch',lhs.retdate)
    BETWEEN date_part('epoch',linkdt) AND date_part('epoch', linkenddt::DATE)
WHERE lpad(RHS.gvkey,6,'0') = (SELECT DISTINCT gvkey
  FROM stocks2016.fnd
  WHERE conm = 'APPLE INC');
```

cusip	*permno*	*permco*	*issuno*	*hsic*	*retdate*	*bid*	*ask*
03783310	14593	7	8	3571	2010-01-04	212.38	214.5
03783310	14593	7	8	3571	2010-01-05	213.25	215.59
03783310	14593	7	8	3571	2010-01-06	210.75	215.23
03783310	14593	7	8	3571	2010-01-07	209.05	212
03783310	14593	7	8	3571	2010-01-08	209.06	212
...							

(252 rows)

6

7

```
SELECT count(1) FROM
(SELECT * FROM
  stocks2016.d2010
  LEFT JOIN
  (SELECT lpad(gvkey,6,'0') AS gvkey2,
          liid,
```

```
          linkdt,
          CASE
            WHEN linkenddt = 'E' THEN now()::TEXT
            ELSE linkenddt
          END,
          linkprim
          linktype,
          lpermco,
          lpermno,
          usedflag
   FROM stocks2016.lnk) AS RHS
  ON stocks2016.d2010.permno = RHS.lpermno
     AND stocks2016.d2010.permco = RHS.lpermco
     AND date_part('epoch',retdate)
       BETWEEN date_part('epoch',linkdt) AND date_part('epoch', linkenddt::DATE)
WHERE RHS.gvkey2 = (SELECT DISTINCT gvkey
  FROM stocks2016.fnd
  WHERE conm = 'APPLE INC')) AS LHS
LEFT JOIN
stocks2016.fnd AS RHS
ON LHS.gvkey2 = RHS.gvkey;
```

cusip	*permno*	*permco*	*issuno*	*hsic*	*retdate*	*bid*	*ask*	*prc*
03783310	14593	7	8	3571	2010-01-04	212.38	214.5	214.00999
03783310	14593	7	8	3571	2010-01-04	212.38	214.5	214.00999
03783310	14593	7	8	3571	2010-01-04	212.38	214.5	214.00999
03783310	14593	7	8	3571	2010-01-05	213.25	215.59	214.38
03783310	14593	7	8	3571	2010-01-05	213.25	215.59	214.38
...								

(756 rows)

8

```
SELECT count(1) FROM
(SELECT * FROM
  stocks2016.d2010
  LEFT JOIN
  (SELECT lpad(gvkey,6,'0') AS gvkey2,
          liid,
          linkdt,
          CASE
            WHEN linkenddt = 'E' THEN now()::TEXT
            ELSE linkenddt
          END,
          linkprim,
          linktype,
          lpermco,
          lpermno,
          usedflag
   FROM stocks2016.lnk) AS RHS
  ON stocks2016.d2010.permno = RHS.lpermno
    AND stocks2016.d2010.permco = RHS.lpermco
```

```
    AND date_part('epoch',retdate)
      BETWEEN date_part('epoch',linkdt) AND date_part('epoch', linkenddt::DATE)
WHERE RHS.gvkey2 = (SELECT DISTINCT gvkey
  FROM stocks2016.fnd
  WHERE conm = 'APPLE INC')) AS LHS
LEFT JOIN
(stocks2016.fnd) AS RHS
ON LHS.gvkey2 = RHS.gvkey
  AND date_part('epoch', LHS.retdate)
    BETWEEN date_part('epoch', stocks2016.fnd.datadate)
      AND date_part('epoch', RHS.datadate) + 31536000 - 86400;
```

linkprim	*linktype*	*lpermco*	*lpermno*	*usedflag*	*cash*	*cik*	*conm*
03783310	14593	7	8	3571	2010-01-04	212.38	214.5
03783310	14593	7	8	3571	2010-01-05	213.25	215.59
03783310	14593	7	8	3571	2010-01-06	210.75	215.23
03783310	14593	7	8	3571	2010-01-07	209.05	212
03783310	14593	7	8	3571	2010-01-08	209.06	212
03783310	14593	7	8	3571	2010-01-11	208.45	213
...							

(252 rows)

4.1.2

1

```
SELECT count(1) FROM stocks2016.lnk;
```

count
145858

(1 row)

```
SELECT count(1) FROM stocks2016.fnd;
```

count
33817

(1 row)

```
SELECT count(1) FROM stocks2016.d2010;
```

count
1679323

(1 row)

```
SELECT count(1) FROM stocks2016.d2011;
```

count
1697800

(1 row)

2

```
SELECT count(*)
FROM stocks2016.lnk
WHERE linktype in ('LC', 'LU') AND linkprim in ('P', 'C');
```

count
56236

(1 row)

```
SELECT COUNT(*) FROM
(SELECT lpad(gvkey,6,'00') AS gvkey
  FROM stocks2016.lnk
  WHERE linktype IN ('LU','LC') AND linkprim IN ('P','C')) AS LHS
INNER JOIN
(SELECT * FROM stocks2016.fnd) AS RHS
USING (gvkey);
```

count
49604

(1 row)

```
SELECT COUNT(*) FROM
(SELECT *
FROM stocks2016.lnk
WHERE linktype IN ('LU','LC') AND linkprim IN ('P','C')) AS LHS
 INNER JOIN
(SELECT * FROM stocks2016.d2010) AS RHS
ON LHS.lpermno=RHS.permno AND LHS.lpermco=RHS.permco;
```

count
3194358

(1 row)

```
SELECT COUNT(*) FROM
(SELECT *
FROM stocks2016.lnk
WHERE linktype IN ('LU','LC') AND linkprim IN ('P','C')) AS LHS
 INNER JOIN
(SELECT * FROM stocks2016.d2011) AS RHS
ON LHS.lpermno=RHS.permno AND LHS.lpermco=RHS.permco;
```

count
3128252

(1 row)

3

```
SELECT count(*)
FROM stocks2016.d2010
WHERE permno is null;
```

count
0

(1 row)

```
SELECT count(1)
FROM
  (SELECT count(1) AS ct FROM
    (SELECT permco
    FROM stocks2016.d2010
    GROUP BY permco, permno) AS A
  GROUP BY permco) AS B
WHERE ct>1;
```

count
101

(1 row)

4

```
SELECT count(1) FROM stocks2016.fnd WHERE gvkey is null;
```

count
0

(1 row)

```
SELECT count(1) FROM stocks2016.fnd WHERE datadate is null;
```

count
0

(1 row)

5

```
SELECT count(1), gvkey, date\_part('year', datadate::date)
FROM stocks2016.fnd
GROUP BY 2,3
having count(1) > 1;
```

count	*gvkey*	*date_part*
2	180599	2011
2	013145	2010
2	108836	2011
2	186121	2010
2	147308	2009
2	107894	2009
2	179694	2011
2	186772	2011
2	170311	2011
2	028490	2011
...		

(51 rows)

6

```
SELECT gvkey, datadate, MIN(nextret) AS nextret FROM
(SELECT gvkey, datadate FROM stocks2016.fnd) AS LHS
LEFT JOIN
(SELECT gvkey, datadate AS nextret FROM stocks2016.fnd) AS RHS
using (gvkey)
WHERE LHS.datadate < RHS.nextret
AND gvkey = (SELECT DISTINCT gvkey FROM stocks2016.fnd WHERE conm = 'APPLE INC')
GROUP BY gvkey, datadate;
```

gvkey	*datadate*	*nextret*
180599	2011-03-31	2011-12-31
180599	2009-03-31	2010-03-31
180599	2010-03-31	2011-03-31

(3 rows)

7

```
SELECT gvkey2 AS gvkey, permno, permco, cash, emp, netinc, rev,
       fnddt, tic, conm, prc\_, ret, vol, shrout
FROM
 (SELECT * FROM
 (SELECT * FROM
 stocks2016.d2010
       LEFT JOIN
 (SELECT *, lpad(gvkey, 6, '0') AS gvkey2 FROM stocks2016.lnk
 WHERE linktype IN ('LU', 'LC') AND linkprim IN ('P', 'C')
```

```
 AND date\_part('year', linkdt) <= 2010
 AND (linkenddt = 'E' OR ((LEFT(linkenddt, 4))::FLOAT >= 2010 AND linkenddt != 'E'))) AS RHS
 ON stocks2016.d2010.permno = RHS.lpermno AND stocks2016.d2010.permco = RHS.lpermco) AS LHS2
     LEFT JOIN
 (SELECT gvkey AS gvkey3, datadate, MIN(nextret) AS nextret FROM
   (SELECT gvkey, datadate FROM stocks2016.fnd) AS LHS
       LEFT JOIN
   (SELECT gvkey, datadate AS nextret FROM stocks2016.fnd) AS RHS
   USING (gvkey)
   WHERE LHS.datadate < RHS.nextret
   GROUP BY gvkey, datadate) AS RHS2
 ON LHS2.gvkey2 = RHS2.gvkey3) AS LHS3
   LEFT JOIN
 (SELECT cash, emp, netinc, rev, datadate AS fnddt, tic, conm, gvkey AS gvkey4
 FROM stocks2016.fnd) AS RHS3
ON LHS3.gvkey2 = RHS3.gvkey4;
```

4.2 Other Questions

1

a

```
SELECT retdate, AVG(ret::FLOAT) AS equal\_weighted\_return
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY retdate
ORDER BY 1;
```

retdate	*equal_weighted_return*
2010-01-04	0.0191203468111077
2010-01-05	0.00247520686498856
2010-01-06	0.00321045536395543
2010-01-07	0.00688680061068702
2010-01-08	0.00726802457640055
2010-01-11	0.00356759804818542
2010-01-12	-0.0101702171393717
2010-01-13	0.00888968664226898
2010-01-14	0.00443147406955462
2010-01-15	-0.00866409743824334
...	

(252 rows)

b

```
SELECT AVG((ret::FLOAT)*vol*abs(prc\_)) AS mrkt\_ret, retdate
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY retdate;
```

mrkt_ret	*retdate*
-77018.0953005268	2010-04-26
153020.309874198	2010-08-16
89659.0468552718	2010-09-10
500122.897046624	2010-12-02
-42686.0166034468	2010-06-16
-193364.961943896	2010-07-28
794219.648273802	2010-10-05
21634.5130901749	2010-02-12
323284.180991414	2010-11-02
446966.560164994	2010-12-17
...	

(252 rows)

c

```
SELECT mrkt\_ret, retdate FROM
 (SELECT AVG((ret::FLOAT)*vol*abs(prc\_)) AS mrkt\_ret, retdate
 FROM stocks2016.d2010
 WHERE ret NOT IN ('B', 'C')
 GROUP BY retdate) AS A
WHERE retdate = '2010-01-21';
```

mrkt_ret	*retdate*
-1057989.3340833	2010-01-21

(1 row)

d

```
SELECT AVG((ret::FLOAT)) AS avgret,
 AVG((ret::FLOAT)*vol*abs(prc\_)) AS mrkt\_ret, retdate
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY retdate;
```

avgret	*mrkt_ret*	*retdate*
0.00266098617231423	-77018.0953005268	2010-04-26
0.00363016815769522	153020.309874198	2010-08-16
0.00408243721565059	89659.0468552718	2010-09-10
0.00893513607402913	500122.897046624	2010-12-02
-0.00197018672136129	-42686.0166034468	2010-06-16
-0.00781766262135922	-193364.961943896	2010-07-28
0.0185483627674101	794219.648273802	2010-10-05
0.00312267508750571	21634.5130901749	2010-02-12
0.0116843508638982	323284.180991414	2010-11-02
0.00367113058627484	446966.560164994	2010-12-17
...		

(252 rows)

e

```
SELECT permno, permco FROM
 (SELECT permno, permco, ret, retdate
 FROM stocks2016.d2010) AS LHS
LEFT JOIN
 (SELECT AVG((ret::FLOAT)) AS avgret, retdate
 FROM stocks2016.d2010
 WHERE ret NOT IN ('B', 'C')
 GROUP BY retdate) AS RHS
USING (retdate)
WHERE ret NOT IN ('B', 'C') AND (ret::FLOAT) > avgret
GROUP BY permno, permco
HAVING count(1) > 150;
```

permno	*permco*
27975	21194
77729	6913

(2 rows)

f

```
SELECT permno, permco, MAX((ret::FLOAT))-MIN((ret::FLOAT)) AS diff\_ret
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY permno, permco
ORDER BY 3 DESC
LIMIT 1;
```

permno	*permco*	*diff_ret*
82554	14170	5.991032

(1 row)

g

```
SELECT abs(AVG((ret::FLOAT))-AVG((ret::FLOAT)*vol*abs(prc\_))), retdate
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY retdate
ORDER BY 1 DESC
LIMIT 1;
```

abs	*retdate*
2674705.36447007	2010-05-10

(1 row)

2

```
SELECT count(*)
FROM
(SELECT date\_part('MONTH', retdate) AS month,
  date\_part('DAY', retdate) AS day,
  ret::float AS ret\_2010
FROM stocks2016.d2011
WHERE ret NOT IN ('B', 'C')) AS LHS
INNER JOIN
(SELECT date\_part('MONTH', retdate) AS month,
  date\_part('DAY', retdate) AS day,
  AVG(ret::float) AS avg\_ret\_2011
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY 1,2) AS RHS
using(month, day)
WHERE ret\_2010 > avg\_ret\_2011;
```

count
634986

(1 row)

```
SELECT count(*)
FROM
(SELECT date\_part('MONTH', retdate) AS month,
  date\_part('DAY', retdate) AS day,
  ret::float AS ret\_2011
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')) AS LHS
INNER JOIN
(SELECT date\_part('MONTH', retdate) AS month,
  date\_part('DAY', retdate) AS day,
  AVG(ret::float) AS avg\_ret\_2010
FROM stocks2016.d2011
WHERE ret NOT IN ('B', 'C')
GROUP BY 1,2) AS RHS
using(month, day)
WHERE ret\_2011 > avg\_ret\_2010;
```

count
648775

(1 row)

3

```
SELECT ctinner::FLOAT/ctall AS percentage FROM
(SELECT COUNT(DISTINCT retdate) AS ctall FROM stocks2016.d2010)AS LHS1
CROSS JOIN
```

```
 (SELECT COUNT(1) AS ctinner FROM
(SELECT DISTINCT(retdate)AS retdate FROM stocks2016.d2010 ORDER BY 1) AS LHS
INNER JOIN
 (SELECT retdate-365 AS retdate FROM
   (SELECT DISTINCT(retdate)FROM stocks2016.d2011 ORDER BY 1) AS TEMP)AS RHS
USING(retdate)) AS RHS;
```

percentage
0.793650793650794

(1 row)

4

```
SELECT permno, permco, abs(yearly\_return\_2010-yearly\_return\_2011) AS reversechange
FROM
(SELECT permno, permco, abs((lstdayprc\_-frtdayprc\_)/frtdayprc\_) AS yearly\_return\_2010
FROM(
SELECT
 permno, permco,
 SUM(CASE WHEN frtday=retdate THEN prc\_ ELSE 0 END) AS frtdayprc\_,
 SUM(CASE WHEN lstday=retdate THEN prc\_ ELSE 0 END) AS lstdayprc\_
FROM(
SELECT * FROM
(SELECT permno, permco, MIN(retdate) AS frtday, MAX(retdate) AS lstday FROM stocks2016.d2010
WHERE prc\_ is not null
GROUP BY 1,2) AS LLHS
LEFT JOIN
(SELECT permno, permco, prc\_, retdate FROM stocks2016.d2010) AS LRHS
USING(permno, permco)
WHERE(LRHS.retdate=LLHS.frtday OR LRHS.retdate=LLHS.lstday)
) AS TEMP
GROUP BY 1,2
) AS TEMP2
WHERE frtdayprc\_!=0) AS LLLHS
INNER JOIN
(SELECT permno, permco, abs((lstdayprc\_-frtdayprc\_)/frtdayprc\_) AS yearly\_return\_2011
FROM(
SELECT
 permno, permco,
 SUM(CASE WHEN frtday=retdate THEN prc\_ ELSE 0 END) AS frtdayprc\_,
 SUM(CASE WHEN lstday=retdate THEN prc\_ ELSE 0 END) AS lstdayprc\_
FROM(
SELECT * FROM
(SELECT permno, permco, MIN(retdate) AS frtday, MAX(retdate) AS lstday FROM stocks2016.d2011
WHERE prc\_ is not null
GROUP BY 1,2) AS RLHS
LEFT JOIN
(SELECT permno, permco, prc\_, retdate FROM stocks2016.d2011) AS RRHS
USING(permno, permco)
WHERE(RRHS.retdate=RLHS.frtday OR RRHS.retdate=RLHS.lstday)
) AS TEMP
GROUP BY 1,2
```

```
) AS TEMP2
WHERE frtdayprc\_!=0) AS RRRHS
using (permno, permco)
ORDER BY 3 desc
LIMIT 5;
```

permno	*permco*	*reversechange*
80625	13139	36.4589552238806
85047	15532	29.1259259259259
11056	8926	28.041465051111
83551	14615	26.6631704885344
92282	52760	23.127992765918

(5 rows)

5

```
SELECT LHS\_tic AS tic,
 SUM(CASE
   WHEN RHS\_tic < LHS\_tic THEN 1
   ELSE 0
 END) AS num\_before
FROM
 (SELECT * FROM
   (SELECT DISTINCT tic AS LHS\_tic FROM stocks2016.fnd
   WHERE tic IS NOT null AND fyear = 2010) AS LHS
 CROSS JOIN
   (SELECT DISTINCT tic AS RHS\_tic FROM stocks2016.fnd
   WHERE tic IS NOT null AND fyear = 2010) AS RHS) AS A
GROUP BY 1
ORDER BY 1;
```

tic	*num_before*
0015B	0
0030B	1
0032A	2
0033A	3
0038A	4
0039A	5
0040A	6
0044A	7
0048A	8
0051A	9
0052A	10
...	

(11073 rows)

6

```
SELECT count(1) FROM
 (SELECT permno, permco, retdate\_month,
     (MAX(prc\_\_last\_)-MAX(prc\_\_first))/MAX(prc\_\_first) AS monthly\_ret
 FROM
   (SELECT *,
     CASE
       WHEN retdate\_epoch = month\_first THEN prc\_
     END AS prc\_\_first,
     CASE
       WHEN retdate\_epoch = month\_last\_ THEN prc\_
     END AS prc\_\_last\_
   FROM
     (SELECT permno AS permno1, permco AS permco1, prc\_,
       date\_part('epoch', retdate) AS retdate\_epoch
     FROM stocks2016.d2010) AS LHS
   LEFT JOIN
     (SELECT permno, permco, date\_part('month', retdate) AS retdate\_month,
       MIN(date\_part('epoch', retdate)) AS month\_first,
       MAX(date\_part('epoch', retdate)) AS month\_last\_
     FROM stocks2016.d2010
     GROUP BY 1,2,3) AS RHS
   ON LHS.permco1 = RHS.permco AND LHS.permno1 = RHS.permno
   WHERE retdate\_epoch = month\_first OR retdate\_epoch = month\_last\_) AS A
 GROUP BY 1,2,3) AS LHS2
LEFT JOIN
 (SELECT permno, permco, MAX(monthly\_ret) AS monthly\_ret, count(1) AS ct
 FROM
   (SELECT permno, permco, retdate\_month,
     (MAX(prc\_\_last\_)-MAX(prc\_\_first))/MAX(prc\_\_first) AS monthly\_ret
   FROM
     (SELECT *,
       CASE
         WHEN retdate\_epoch = month\_first THEN prc\_
       END AS prc\_\_first,
       CASE
         WHEN retdate\_epoch = month\_last\_ THEN prc\_
       END AS prc\_\_last\_
     FROM
       (SELECT permno AS permno1, permco AS permco1, prc\_,
         date\_part('epoch', retdate) AS retdate\_epoch
       FROM stocks2016.d2010) AS LHS
     LEFT JOIN
       (SELECT permno, permco, date\_part('month', retdate) AS retdate\_month,
         MIN(date\_part('epoch', retdate)) AS month\_first,
         MAX(date\_part('epoch', retdate)) AS month\_last\_
       FROM stocks2016.d2010
       GROUP BY 1,2,3) AS RHS
     ON LHS.permco1 = RHS.permco AND LHS.permno1 = RHS.permno
     WHERE retdate\_epoch = month\_first OR retdate\_epoch = month\_last\_) AS A
   GROUP BY 1,2,3) AS B
 GROUP BY permno, permco) AS RHS2
USING (permno, permco, monthly\_ret)
WHERE ct IS NOT null AND retdate\_month = 1;
```

count
343

(1 row)

7

```
SELECT
 SUM(CASE
   WHEN monthly\_ret2 > monthly\_ret AND monthly\_ret2 IS NOT null THEN 1
   ELSE 0
 END)*1.0/count(1) AS probability
FROM
 (SELECT permno, permco, retdate\_month,
       (MAX(prc\_last\_)-MAX(prc\_first))/MAX(prc\_first) AS monthly\_ret
 FROM
   (SELECT *,
     CASE
       WHEN retdate\_epoch = month\_first THEN prc\_
     END AS prc\_first,
     CASE
       WHEN retdate\_epoch = month\_last\_ THEN prc\_
     END AS prc\_last\_
   FROM
     (SELECT permno AS permno1, permco AS permco1, prc\_,
       date\_part('epoch', retdate) AS retdate\_epoch
     FROM stocks2016.d2010) AS LHS
   LEFT JOIN
     (SELECT permno, permco, date\_part('month', retdate) AS retdate\_month,
       MIN(date\_part('epoch', retdate)) AS month\_first,
       MAX(date\_part('epoch', retdate)) AS month\_last\_
     FROM stocks2016.d2010
     GROUP BY 1,2,3) AS RHS
   ON LHS.permco1 = RHS.permco AND LHS.permno1 = RHS.permno
   WHERE retdate\_epoch = month\_first OR retdate\_epoch = month\_last\_) AS A
 GROUP BY 1,2,3) AS LHS
LEFT JOIN
 (SELECT permno, permco, retdate\_month-1 AS retdate\_month,
       (MAX(prc\_last\_)-MAX(prc\_first))/MAX(prc\_first) AS monthly\_ret2
 FROM
   (SELECT *,
     CASE
       WHEN retdate\_epoch = month\_first THEN prc\_
     END AS prc\_first,
     CASE
       WHEN retdate\_epoch = month\_last\_ THEN prc\_
     END AS prc\_last\_
   FROM
     (SELECT permno AS permno1, permco AS permco1, prc\_,
       date\_part('epoch', retdate) AS retdate\_epoch
     FROM stocks2016.d2010) AS LHS
   LEFT JOIN
     (SELECT permno, permco, date\_part('month', retdate) AS retdate\_month,
       MIN(date\_part('epoch', retdate)) AS month\_first,
```

```
      MAX(date\_part('epoch', retdate)) AS month\_last\_
    FROM stocks2016.d2010
    GROUP BY 1,2,3) AS RHS
  ON LHS.permco1 = RHS.permco AND LHS.permno1 = RHS.permno
  WHERE retdate\_epoch = month\_first OR retdate\_epoch = month\_last\_) AS A
GROUP BY 1,2,3) AS RHS
USING (permno, permco, retdate\_month);
```

probability
0.47115839243498817967

(1 row)

8

```
SELECT permno, permco, 365-days\_before-numdays AS missing\_numdays
FROM
 (SELECT *,
   (first\_date-date\_part('epoch', '2010-01-01'::date))/86400 AS days\_before
 FROM
   (SELECT permno, permco, count(1) AS numdays
   FROM stocks2016.d2010
   GROUP BY permno, permco) AS LHS
 LEFT JOIN
   (SELECT permno, permco, MIN(date\_part('epoch', retdate)) AS first\_date
   FROM stocks2016.d2010
   GROUP BY permno, permco) AS RHS
 USING (permno, permco)) AS A;
```

permno	*permco*	*missing_numdays*
10001	7953	110
10002	7954	110
10025	7975	110
10026	7976	110
10028	7978	110
10032	7980	110
10044	7992	110
10051	7999	110
10065	20023	110
10078	8021	346
...		

(7108 rows)

9

a

```
SELECT AVG((ret::FLOAT)) AS avgret, retdate
FROM stocks2016.d2010
WHERE ret NOT IN ('B', 'C')
GROUP BY retdate
HAVING SUM(vol) > 0;
```

avgret	*retdate*
0.00266098617231423	2010-04-26
0.00363016815769522	2010-08-16
0.00408243721565059	2010-09-10
0.00893513607402913	2010-12-02
-0.00197018672136129	2010-06-16
-0.00781766262135922	2010-07-28
0.0185483627674101	2010-10-05
0.00312267508750571	2010-02-12
0.0116843508638982	2010-11-02
0.00367113058627484	2010-12-17
...	

(252 rows)

```
SELECT AVG((ret::FLOAT)) AS avgret, retdate
FROM stocks2016.d2011
WHERE ret NOT IN ('B', 'C')
GROUP BY retdate
HAVING SUM(vol) > 0;
```

avgret	*retdate*
-0.00675280182094083	2011-01-04
0.0157599200059586	2011-09-27
0.0189066896346011	2011-12-09
0.00389523259326385	2011-02-08
0.000393707960644009	2011-10-20
0.00724000664752982	2011-03-17
0.010976879735418	2011-05-18
0.0147213890232839	2011-02-01
0.00421418543442499	2011-07-15
0.0171193941246645	2011-10-05
...	

(252 rows)

b

```
SELECT
  permno,
  permco,
  (AVG(ret*avgret)-(AVG(ret)*AVG(avgret)))/(SQRT(AVG(ret\^2) -
  (AVG(ret)*AVG(ret)))*SQRT(AVG(avgret\^2)-(AVG(avgret)*AVG(avgret))))
  AS correlation
FROM
 (SELECT * FROM
   (SELECT permno, permco, (ret::FLOAT) AS ret, retdate
   FROM stocks2016.d2010
   WHERE ret NOT IN ('B', 'C')) AS LHS
 LEFT JOIN
   (SELECT AVG((ret::FLOAT)) AS avgret, retdate
   FROM stocks2016.d2010
```

```
   WHERE ret NOT IN ('B', 'C')
   GROUP BY retdate
   HAVING SUM(vol) > 0) AS RHS
 USING (retdate)
 ORDER BY permno, permco) AS A
GROUP BY permno, permco;
```

permno	*permco*	*correlation*
10001	7953	0.103680743777476
10002	7954	0.106402130270876
10025	7975	0.568309622313311
10026	7976	0.531373747153143
10028	7978	0.140051921879338
10032	7980	0.65622606002088
10044	7992	0.195019951484385
10051	7999	0.37970098802115
10065	20023	0.938191858701633
10078	8021	-0.18652613628336
...		

(7041 rows)

```
SELECT
  permno,
  permco,
  (AVG(ret*avgret)-(AVG(ret)*AVG(avgret)))/(SQRT(AVG(ret\^2) -
  (AVG(ret)*AVG(ret)))*SQRT(AVG(avgret\^2)-(AVG(avgret)*AVG(avgret))))
  AS correlation
FROM
 (SELECT * FROM
   (SELECT permno, permco, (ret::FLOAT) AS ret, retdate
   FROM stocks2016.d2011
   WHERE ret NOT IN ('B', 'C')) AS LHS
 LEFT JOIN
   (SELECT AVG((ret::FLOAT)) AS avgret, retdate
   FROM stocks2016.d2011
   WHERE ret NOT IN ('B', 'C')
   GROUP BY retdate
   HAVING SUM(vol) > 0) AS RHS
 USING (retdate)
 ORDER BY permno, permco) AS A
GROUP BY permno, permco;
```

permno	*permco*	*correlation*
10001	7953	0.293168845250529
10002	7954	0.1229397678128
10025	7975	0.71954827820625
10026	7976	0.793998055454881
10028	7978	0.213824624825929
10032	7980	0.704085102718905
10044	7992	0.150239432564814
10051	7999	0.585723405676299
10065	20023	0.953925354461383
10100	8042	0.0485801548426597
...		

(7083 rows)

c

```
SELECT permno, permco,
 (MAX(prc\_last\_)-MAX(prc\_first))/MAX(prc\_first) AS yearly\_ret2010
FROM
 (SELECT *,
   CASE
     WHEN retdate\_epoch = retdate\_first THEN prc\_
   END AS prc\_first,
   CASE
     WHEN retdate\_epoch = retdate\_last\_ THEN prc\_
   END AS prc\_last\_
 FROM
   (SELECT permno, permco, prc\_,
     date\_part('epoch', retdate) AS retdate\_epoch
   FROM stocks2016.d2010) AS LHS
 LEFT JOIN
   (SELECT permno, permco,
     MIN(date\_part('epoch', retdate)) AS retdate\_first,
     MAX(date\_part('epoch', retdate)) AS retdate\_last\_
   FROM stocks2016.d2010
   WHERE prc\_ IS NOT null --gets the first AND last\_ dates that are not null
   GROUP BY permno, permco) AS RHS
 USING (permno, permco)
 WHERE retdate\_epoch = retdate\_first OR retdate\_epoch = retdate\_last\_) AS A
GROUP BY permno, permco;


SELECT permno, permco,
 (MAX(prc\_last\_)-MAX(prc\_first))/MAX(prc\_first) AS yearly\_ret2011
FROM
 (SELECT *,
   CASE
     WHEN retdate\_epoch = retdate\_first THEN prc\_
   END AS prc\_first,
   CASE
     WHEN retdate\_epoch = retdate\_last\_ THEN prc\_
   END AS prc\_last\_
 FROM
```

```
   (SELECT permno, permco, prc\_,
     date\_part('epoch', retdate) AS retdate\_epoch
   FROM stocks2016.d2011) AS LHS
 LEFT JOIN
   (SELECT permno, permco,
     MIN(date\_part('epoch', retdate)) AS retdate\_first,
     MAX(date\_part('epoch', retdate)) AS retdate\_last\_
   FROM stocks2016.d2011
   WHERE prc\_ IS NOT null --gets the first AND last\_ dates that are not null
   GROUP BY permno, permco) AS RHS
 USING (permno, permco)
 WHERE retdate\_epoch = retdate\_first OR retdate\_epoch = retdate\_last\_) AS A
GROUP BY permno, permco;
```

d