```
Options macrogen symbolgen mlogic mprint mfile;
*Options nomacrogen NoSymbolgen nomlogic nomprint nomfile;

/*
    Just need to change the following 3 macro definitions to start at a
particular vintage month and process
    roll-rate for a number of months after.
*/

%let vintage_index = 20;      /* index of vintage month we which to
process*/
%let end_index = 29;          /* index of month in which we want to stop
calculating roll-rate */
%let max_roll_months = 12;    /* number of months to calculate a roll-up
*/

%let month1 = 201301;
%let month2 = 201302;
%let month3 = 201303;
%let month4 = 201304;
%let month5 = 201305;
%let month6 = 201306;
%let month7 = 201307;
%let month8 = 201308;
%let month9 = 201309;
%let month10 = 201310;
%let month11 = 201311;
%let month12 = 201312;
%let month13 = 201401;
%let month14 = 201402;
%let month15 = 201403;
%let month16 = 201404;
%let month17 = 201405;
%let month18 = 201406;
%let month19 = 201407;
%let month20 = 201408;
%let month21 = 201409;
%let month22 = 201410;
%let month23 = 201411;
%let month24 = 201412;
%let month25 = 201501;
%let month26 = 201502;
%let month27 = 201503;
%let month28 = 201504;
%let month29 = 201505;

%let suffix = _a613454;

/*
    Step 1 - produce an account level NCC table
*/
```

```
%macro step1;
proc sql noerrorstop;
connect to teradata(server="bmg.wellsfargo.com" user="&ldap_user@LDAP"
password="&ldap_pwd" connection=global mode=teradata);
execute    (drop table
BMGU_TEMP.ldc_ncc_rr_acct&suffix._&&month&vintage_index) by teradata;

/* Pick list of NCC (account level) */

execute(create table
BMGU_TEMP.ldc_ncc_rr_acct&suffix._&&month&vintage_index as
(
select
  extract(year from sale_dt) * 100 + extract(month from sale_dt) as vintage
, acct_num
from bmgu_dpgadhoc.ncc_time_series
where bus_type = 'Consumer'
and new_prod_cust_ind = 'Y'
having vintage = &&month&vintage_index
group by 1,2
)
with data primary index (vintage, acct_num)
) by teradata;

execute(alter table
BMGU_TEMP.ldc_ncc_rr_acct&suffix._&&month&vintage_index
add CUST_NUM decimal(15,0),
add eth_bmg_cd integer default -1
) by teradata;

/*
   additional step that is necessary when a VINTAGE month ends on a weekend
or Holiday
   This is because the SALE_DT from NCC table is from STS and includes
Sat/Sun/Holidays,
   whereas the BMG tables will show an OPEN_DT of Monday for an account
opened over a weekend.
*/

%let next_month_index = %eval(&vintage_index + 1); /* Vintage Month + 1
*/
%put next_month_index = &next_month_index;
%put next_month = &&month&next_month_index;

execute(update a
from BMGU_TEMP.ldc_ncc_rr_acct&suffix._&&month&vintage_index as a
, BMGPDD.ACCT_CUST_HG_&&month&next_month_index._CIS as b    /* VINTAGE
MONTH + 1 */
set CUST_NUM = b.CUST_NUM
where a.acct_num = b.acct_num
and a.CUST_NUM is null
```

```
) by teradata;



/* Add ethnicity using etech data */
execute(
update a
from BMGU_TEMP.ldc_ncc_rr_acct&suffix._&&month&vintage_index  a, (sel
cust_num, max(eth_bmg_cd) as eth_bmg_cd
                                                from
BMGU_BMGETH.SR_COMBINED_ETH
                                                where curr_flag='Y'
                                                group by 1)  b
set eth_bmg_cd = b.eth_bmg_cd
where a.cust_num = b.cust_num) by teradata;

disconnect from teradata;

quit;
%mend; /* step1 */


/*
   Step 2 - produce a customer level NCC table
*/

%macro step2;
proc sql noerrorstop;
connect to teradata(server="bmg.wellsfargo.com" user="&ldap_user@LDAP"
password="&ldap_pwd" connection=global mode=teradata);
execute    (drop table
BMGU_TEMP.ldc_ncc_rr_cust&suffix._&&month&vintage_index) by teradata;

/* Collapse to customer */

execute(create table
BMGU_TEMP.ldc_ncc_rr_cust&suffix._&&month&vintage_index as
(
select
  VINTAGE,
  CUST_NUM,
  max(eth_bmg_cd) as eth_bmg_cd
from BMGU_TEMP.ldc_ncc_rr_acct&suffix._&&month&vintage_index group by
1,2)
with data primary index (VINTAGE, CUST_NUM)
) by teradata;


/*
    We will evaluate, at a maximum, &max_roll_month roll-up months
*/
```

```
execute(alter table
BMGU_TEMP.ldc_ncc_rr_cust&suffix._&&month&vintage_index
%do i = 1 %to &max_roll_months;
add PRIM_Mo&i integer default 0 %if &i LT &max_roll_months %then ,;
%end;
) by teradata;

%let j =0;  /* use to reference PRIM_Mo */

%do i = &vintage_index %to &end_index ;

%let j = %eval(&j + 1); /* next PRIM_Mo */

execute(update x
from BMGU_TEMP.ldc_ncc_rr_cust&suffix._&&month&vintage_index as x
, ( select
        a.cust_num
      , max(b.prim_in) as primary_cust
      , max(opened_in) as opened_cust
      from
        BMGPDD.ACCT_CUST_HG_&&month&i._CIS as a
      , (
            select
              m.acct_num
            , m.co_id
            , m.asof_yyyymm
            , m.prim_in
            , case when n.close_dt is null then 1 else 0 end as opened_in
            from BMGPDD.ACCT_CK_PRIM_&&month&i._BMG as m
            , BMGPDD.ACCT_MSTR_&&month&i._HG as n
            where m.acct_num = n.acct_num
            and m.co_id = n.co_id
            and m.bus_in = 0  /* Consumer */
            group by 1,2,3,4,5
        ) as b
      where a.acct_num = b.acct_num
      and a.co_id = b.co_id
      group by 1
 ) as y
set PRIM_Mo&j = primary_cust
where x.CUST_NUM = y.CUST_NUM
and y.opened_cust = 1
) by teradata;
%end;

disconnect from teradata;

quit;


%mend;  /* step2 */
```

```
/*
    Step 3 - Summurize by populations
*/

%macro step3;
libname bmgtemp teradata user="&ldap_user@LDAP" password="&ldap_pwd"
tdpid=bmg.wellsfargo.com schema=bmgu_temp;

proc sql noerrorstop;

/*
    Create a table of counts
*/

create table counts as

/* Sum all Asian NCC */

select
  vintage
, 'A - All Asian    ' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd in (2,8,9,10,11,12,13,14)

group by 1,2

union

/* Sum all Asian Indian NCC */

select
  vintage
, 'B - Asian Indian NCC    ' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 8

group by 1,2

union

/* Sum all Chinese NCC */

select
  vintage
```

```
, 'C - Chinese NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 9

group by 1,2

union

/* Sum all Filipino NCC */

select
  vintage
, 'D - Filipino NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 10

group by 1,2

union

/* Sum all Korean NCC */

select
  vintage
, 'E - Korean NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 11

group by 1,2

union

/* Sum all Vietnamese NCC */

select
  vintage
, 'F - Vietnamese NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
```

```
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 12

group by 1,2

union

/* Sum all Japanese NCC */

select
  vintage
, 'G - Japanese NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 13

group by 1,2

union

/* Sum all other Asian NCC */

select
  vintage
, 'H - Other Asian NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd in (2,14)

group by 1,2

union

/* Sum all African American NCC */

select
  vintage
, 'I - African American NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 1
```

```
group by 1,2

union

/* Sum all Hispanic NCC */

select
  vintage
, 'J - Hispanic NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 4

group by 1,2

union

/* Sum all Caucasian NCC */

select
  vintage
, 'K - Caucasian NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd = 3

group by 1,2

union

/* Sum all Other DS NCC */

select
  vintage
, 'L - Other DS NCC' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index
where eth_bmg_cd in (5,6)

group by 1,2

union
```

```
/* Sum all NCC */

select
  vintage
, 'M - All NCC                        ' as pop_type
, count(*) as NCC
%do i = 1 %to &max_roll_months;
, sum( PRIM_Mo&i ) as Prim_mo&i._cnt
%end;
from bmgtemp.ldc_ncc_rr_cust&suffix._&&month&vintage_index

group by 1,2
;


/* Create a table of percentages */

create table percentage as
select
  vintage
, pop_type
%do i = 1 %to &max_roll_months;
, (Prim_mo&i._cnt/NCC) as Prim_mo&i._pct
%end;
from counts
;

quit;

%mend;  /* step3 */

%put timestamp = %sysfunc(time(),time8.0);
%step1;
%step2;
%step3;
%put timestamp = %sysfunc(time(),time8.0);
```