/\*.........................................................................\*/

/\*creating and checking panel data\*/

**proc** **sql**;create table p\_dr as select count(\*)

from panel\_dr;**run**;

/\*545\*/

**proc** **sql**;create table p\_dr\_2 as select distinct \*

from panel\_dr;**run**;

/\*517\*/

**proc** **sql**;create table p\_gr as select count(\*)

from panel\_gr;**run**;

/\*4443\*/

**proc** **sql**;create table p\_gr\_2 as select distinct \*

from panel\_gr;**run**;

/\*3969\*/

**proc** **sql**;create table p\_ma as select count(\*)

from panel\_ma;**run**;

/\*429\*/

**proc** **sql**;create table p\_ma\_2 as select distinct \*

from panel\_ma;**run**;

/\*410\*/

**data** panel\_all;

set p\_gr\_2 p\_dr\_2 p\_ma\_2;

**run**;

/\*4896\*/

**proc** **sql**;create table panel\_all\_2 as select distinct \*

from panel\_all;**run**;

/\*4896\*/

/\*.........................................................................\*/

/\*creating and checking store level data\*/

/\*blades\_drug\*/

/\*679602\*/

**proc** **sql**;create table blades\_drug\_all as select distinct \*

from blades\_drug;**run**;

/\*679602\*/

/\*blades\_groc\_1\*/

/\*825810\*/

/\*blades\_groc\_2\*/

/\*842664\*/

/\*blades\_groc\_3\*/

/\*892511\*/

**data** blades\_groc;

set blades\_groc\_1 blades\_groc\_2 blades\_groc\_3;

**run**;

/\*2560985\*/

**proc** **sql**;create table blades\_groc\_all as select distinct \*

from blades\_groc;**run**;

/\*2560985\*/

**data** blades\_groc\_all\_1;

set blades\_groc\_all;

OUTLET = "GR";

**run**;

**data** blades\_drug\_all\_1;

set blades\_drug\_all;

OUTLET = "DR";

**run**;

**data** store\_all\_2;

set blades\_drug\_all\_1 blades\_groc\_all\_1;

**run**;

/\*3240587\*/

/\*.........................................................................\*/

/\*delivery stores\*/

/\*delivery\_stores\*/

/\*2051\*/

**proc** **sql**;create table delivery\_stores\_2 as select distinct \*

from delivery\_stores;**run**;

/\*2051\*/

/\*.........................................................................\*/

/\*iri\_week\*/

/\*iri\_week\*/

/\*526\*/

**proc** **sql**;create table iri\_week\_2 as select distinct \*

from iri\_week;**run**;

/\*526\*/

/\*.........................................................................\*/

/\*prod\_blades\*/

/\*prod\_blades\*/

/\*1369\*/

**proc** **sql**;create table prod\_blades\_2 as select distinct \*

from prod\_blades;**run**;

/\*1369\*/

/\*.........................................................................\*/

/\*ads\*/

/\*ads\*/

/\*13983\*/

**proc** **sql**;create table ads\_2 as select distinct \*

from ads;**run**;

/\*13983\*/

/\*.........................................................................\*/

/\*permanently storing datasets\*/

libname and "C:\Users\axa170331\Desktop\sas\_lib";

**data** and.customer;

set panel\_all\_2;

**run**;

**data** and.store;

set store\_all\_2;

**run**;

**data** and.delivery\_stores;

set delivery\_stores\_2;

**run**;

**data** and.iri\_week;

set iri\_week\_2;

**run**;

/\*526\*/

**data** and.prod\_blades;

set prod\_blades\_2;

**run**;

/\*1369\*/

**data** and.ads;

set ads\_2;

**run**;

/\*13983\*/

/\*.......................................................................\*/

/\*making change to dataset\*/

**data** prod (drop = sy ge vend item);

set and.prod\_blades;

sy\_1 = input(sy, **8.**);

ge\_1 = input(ge, **8.**);

vend\_1 = input(vend, **8.**);

item\_1 = input(item, **8.**);

**run**;

**data** prod\_2;

set prod;

rename sy\_1=sy;

rename ge\_1=ge;

rename vend\_1=vend;

rename item\_1=item;

**run**;

**data** and.prod\_blades;

set prod\_2;

**run**;

/\*.................................................\*/

/\*left join checks\*/

**proc** **sql**;create table c1 as

select panid

from and.customer;**run**;

/\*4896\*/

/\*.......\*/

**proc** **sql**;create table c2 as

select iri\_key

from and.delivery\_stores;**run**;

/\*2051\*/

**proc** **sql**;create table c2\_2 as

select distinct iri\_key

from and.delivery\_stores;**run**;

/\*2044\*/

**proc** **sql**;create table and.delivery\_stores as

select distinct iri\_key, market\_name

from and.delivery\_stores;**run**;

/\*2044\*/

/\*.......\*/

**proc** **sql**;create table c3 as

select panelist\_id

from and.ads;**run**;

/\*13983\*/

**proc** **sql**;create table c3\_2 as

select distinct panelist\_id

from and.ads;**run**;

/\*13983\*/

/\*.......\*/

**proc** **sql**;create table c4 as

select upc

from and.prod\_blades;**run**;

/\*1369\*/

**proc** **sql**;create table c4\_2 as

select distinct upc

from and.prod\_blades;**run**;

/\*1369\*/

**proc** **sql**;create table c4\_3 as

select distinct sy, ge, vend, item

from and.prod\_blades;**run**;

/\*1369\*/

/\*...............\*/

**data** c5;

set and.customer;

item = input(reverse(substr(reverse(strip(input(colupc, $20.))),**1**,**5**)),**12.**);

vend = input(reverse(substr(reverse(strip(input(colupc, $20.))),**6**,**5**)),**12.**);

ge = input(reverse(substr(reverse(strip(input(colupc, $20.))),**11**,**1**)),**12.**);

sy = input(reverse(substr(reverse(strip(input(colupc, $20.))),**12**,**1**)),**12.**);

if ge=**.** then ge=**0**;

if sy=**.** then sy=**0**;

**run**;

**proc** **sql**;create table c5\_3 as

select a.panid

from c5 a inner join and.prod\_blades b

on a.sy = b.sy

and a.ge = b.ge

and a.vend = b.vend

and a.item = b.item;

**run**;

/\*3784\*/

**data** and.customer;

set and.customer;

item = input(reverse(substr(reverse(strip(input(colupc, $20.))),**1**,**5**)),**12.**);

vend = input(reverse(substr(reverse(strip(input(colupc, $20.))),**6**,**5**)),**12.**);

ge = input(reverse(substr(reverse(strip(input(colupc, $20.))),**11**,**1**)),**12.**);

sy = input(reverse(substr(reverse(strip(input(colupc, $20.))),**12**,**1**)),**12.**);

if ge=**.** then ge=**0**;

if sy=**.** then sy=**0**;

**run**;

**data** c5;

set and.prod\_blades;

newupc = input(strip(strip(ge)||strip(vend)||strip(item)), **12.**);

**run**;

**proc** **sql**;create table c5\_2 as

select a.colupc

from and.customer a

inner join c5 b

on a.colupc = b.newupc;

**run**;

/\*4896\*/

/\*................................................\*/

/\*market share - H-company wise\*/

**proc** **sql**;

create table main as select a.\*, b.l3, b.l5, b.l9

from and.store a

left join and.prod\_blades b

on a.sy = b.sy

and a.ge = b.ge

and a.vend = b.vend

and a.item = b.item;

**run**;

/\*3240587\*/

**proc** **sql**;

/\*create table top\_brands as\*/

select l3, sum(dollars) as dol

from main group by l3 order by dol desc;

**run**;

/\*..............................................\*/

/\*ads for PG and EZ\*/

**proc** **sql**;

/\*create table top\_brands as\*/

select distinct l3, l5

from main

where l3 in ('PROCTER & GAMBLE', 'ENERGIZER HOLDINGS INC');

**run**;

**proc** **sql**;

create table main\_2 as select a.\*, b.market\_name

from main a

left join and.delivery\_stores b

on a.iri\_key = b.iri\_key

where l3 in ('PROCTER & GAMBLE', 'ENERGIZER HOLDINGS INC')

and l5 not in ('WILKINSON SWORD');

**run**;

/\*2195638\*/

/\*..........................................\*/

/\*top products for PG and EZ\*/

**proc** **sql**;

/\*create table top\_prods as\*/

select l5, sum(dollars) as dol

from main\_2

where l3 in ('PROCTER & GAMBLE')

group by l5 order by dol desc;

**run**;

**proc** **sql**;

/\*create table top\_prods as\*/

select l5, sum(dollars) as dol

from main\_2

where l3 in ('ENERGIZER HOLDINGS INC')

group by l5 order by dol desc;

**run**;

/\*....................................\*/

/\*market wise split for GL vs rest\*/

**proc** **sql**;

create table overall as select a.\*, b.market\_name

from main a

left join and.delivery\_stores b

on a.iri\_key = b.iri\_key;

**run**;

**data** overall\_2;

set overall;

format br $8.;

if l3 = 'PROCTER & GAMBLE' then br="Gillette"; else br="Others";

**run**;

**proc** **sql**;

/\*create table top\_prods as\*/

select market\_name, br, sum(dollars) as dol

from overall\_2

group by market\_name, br;

**run**;

**proc** **sql**;

/\*create table top\_prods as\*/

select outlet, br, sum(dollars) as dol

from overall\_2

group by outlet, br;

**run**;

/\*.......................................................................\*/

/\*cross brand price elasticity\*/

/\*main\_2 which as brand GL and EZ\*/

/\*2195638\*/

**proc** **sql**; create table low\_markets as

select \*,

(case when l3 = 'PROCTER & GAMBLE' then "Gillette" else "Schick" end) as brand

from main\_2

where market\_name in ('SYRACUSE',

'SPOKANE',

'HARRISBURG/SCRANT',

'BUFFALO/ROCHESTER',

'GREEN BAY');

**run**;

/\*127051\*/

**proc** **sql**;create table elast\_1 as

select week, brand, l5,

(sum(dollars)/sum(units)) as price,

sum(units) as quant

from low\_markets group by week, brand, l5;

**run**;

/\*1622\*/

**proc** **sql**;create table elast\_2 as

select week, brand, l5, price, quant, sum(quant) as week\_quant

from elast\_1 group by week, brand;

**run**;

**data** elast\_3;

set elast\_2;

perc\_quant = quant/week\_quant;

perc\_price = price\*perc\_quant;

**run**;

**proc** **sql**;select week, brand, sum(perc\_quant)

from elast\_3 group by week, brand;**run**;

**proc** **sql**;create table elast\_4 as

select week, brand, sum(perc\_price) as brand\_price

from elast\_3 group by week, brand;

**run**;

/\*104\*/

**data** elast\_gl elast\_sc;

set elast\_4;

if brand = "Gillette" then output elast\_gl;

else output elast\_sc;

**run**;

/\*52 52\*/

**proc** **sql**;create table elast\_final as

select a.brand\_price as gl\_price,

b.brand\_price as sc\_price,

c.gl\_sales

from elast\_gl as a

left join elast\_sc b

on a.week = b.week

left join

(select week, sum(dollars) as gl\_sales

from low\_markets where brand = "Gillette" group by week) c

on a.week = c.week;

**run**;

/\*52\*/

**proc** **reg** data=elast\_final;

model gl\_sales = gl\_price;

**run**;

/\*.............................................................\*/

/\*cross product elasticity\*/

**proc** **sql**;select brand, l5, sum(dollars) as rev

from low\_markets group by brand, l5 order by rev desc;**run**;

**proc** **sql**;create table elast\_1 as

select week, l5,

(sum(dollars)/sum(units)) as price

from low\_markets

where l5 in ('GILLETTE MACH3','SCHICK SLIM TWIN')

group by week, l5;

**run**;

/\*104\*/

**data** elast\_gl elast\_sc;

set elast\_1;

if l5 = "GILLETTE MACH3" then output elast\_gl;

else output elast\_sc;

**run**;

/\*52 52\*/

**proc** **sql**;create table elast\_final as

select a.price as gl\_price,

b.price as sc\_price,

c.gl\_sales

from elast\_gl as a

left join elast\_sc b

on a.week = b.week

left join

(select week, sum(dollars) as gl\_sales

from low\_markets where l5 in ('GILLETTE MACH3') group by week) c

on a.week = c.week;

**run**;

/\*52\*/

**proc** **reg** data=elast\_final;

model gl\_sales = gl\_price sc\_price;

**run**;

/\*....................................................\*/

/\*effect of D, F and PR\*/

**proc** **sql**;create table elast\_1 as

select week, l5, l9,

(sum(dollars)/sum(units)) as price,

sum(units) as quant

from low\_markets where brand = 'Gillette' group by week, l5, l9;

**run**;

/\*3179\*/

**proc** **sql**;create table elast\_2 as

select week, l5, l9, price, quant, sum(quant) as week\_quant

from elast\_1 group by week, l5;

**run**;

**data** elast\_3;

set elast\_2;

perc\_quant = quant/week\_quant;

perc\_price = price\*perc\_quant;

**run**;

**proc** **sql**;create table elast\_4 as

select week, l5, sum(perc\_price) as prod\_price

from elast\_3 group by week, l5;

**run**;

/\*973\*/

**data** panel\_1;

set low\_markets;

if f = "A+" then f\_a\_plus = **1**; else f\_a\_plus=**0**;

if f = "A" then f\_a = **1**; else f\_a=**0**;

if f = "B" then f\_b = **1**; else f\_b=**0**;

if f = "C" then f\_c = **1**; else f\_c=**0**;

if d = **1** then d\_small = **1**; else d\_small=**0**;

if d = **2** then d\_big = **1**; else d\_big=**0**;

where brand = "Gillette";

**run**;

**proc** **sql**;create table panel\_2 as

select week, l5, sum(dollars) as sales, sum(units) as quant,

sum(f\_a\_plus) as Aplus, sum(f\_a) as A, sum(f\_b) as B, sum(f\_c) as C,

sum(d\_small) as small\_D, sum(d\_big) as big\_D

from panel\_1 group by week, l5;

**run**;

/\*973\*/

**proc** **sql**;create table panel\_3 as

select a.\*, b.prod\_price

from panel\_2 a left join elast\_4 b

on a.week = b.week

and a.l5 = b.l5;

**run**;

**proc** **sort** data =panel\_3;

by l5 week;

**run**;

**proc** **panel** data = panel\_3;

id l5 week;

model sales = prod\_price Aplus A B C small\_D big\_D / fixtwo;

**run**;

/\*.........................................................\*/

/\*logistic\*/

**proc** **sql**;create table logistic as

select

c.PANID,c.WEEK,c.UNITS,c.OUTLET,c.DOLLARS,c.COLUPC,p.brand,p.newupc,a.Combined\_Pre\_Tax\_Income\_of\_HH,a.Family\_Size,HH\_Race,

a.Age\_Group\_Applied\_to\_Male\_HH,a.Education\_Level\_Reached\_by\_Male as Male\_Edu\_Level,a.Occupation\_Code\_of\_Male\_HH,

a.Male\_Working\_Hour\_Code, a.Age\_Group\_Applied\_to\_Female\_HH,a.Education\_Level\_Reached\_by\_Femal as Female\_Edu\_Level,a.Occupation\_Code\_of\_Female\_HH,

a.Female\_Working\_Hour\_Code,a.Marital\_Status

from and.customer a

inner join and.ads b

on a.panid = b.panelist\_id

inner join and.delivery\_stores c

on a.iri\_key = c.iri\_key

inner join and.prod\_blades d

on a.sy = d.sy

and a.ge = d.ge

and a.vend = d.vend

and a.item = d.item;

**run**;

/\*3388\*/

**proc** **sql**;create table logistic\_2 as select \*,

(case when l3 = 'PROCTER & GAMBLE' then "Gillette" else "Others" end) as brand

from logistic

where market\_name in ('SYRACUSE',

'SPOKANE',

'HARRISBURG/SCRANT',

'BUFFALO/ROCHESTER',

'GREEN BAY');

**run**;

**proc** **logistic** data = logistic\_2;

class OUTLET(ref='DR') Combined\_Pre\_tax\_Income\_of\_HH Family\_Size HH\_Race Occupation\_Code\_of\_Male\_HH Age\_Group\_Applied\_to\_Female\_HH(ref='1') Marital\_Status/ param = ref;

model brand = UNITS OUTLET DOLLARS Combined\_Pre\_tax\_Income\_of\_HH Family\_Size HH\_Race Occupation\_Code\_of\_Male\_HH Age\_Group\_Applied\_to\_Female\_HH Marital\_Status;

**run**;

/\*..........................................................\*/

/\*RFM\*/

**data** cust\_new;

set master.customer1;

**run**;

**data** blades;

set master.prod\_blades;

**run**;

**data** ads;

set master.ads;

**run**;

**proc** **sql**;

create table cust1 as select a.\*, b.l3

from cust\_new a

left join blades b

on a.sy = b.sy

and a.ge = b.ge

and a.vend = b.vend

and a.item = b.item;

**quit**;

**proc** **sql**;

create table cust2 as

select \*

from cust1

where l3 in ('PROCTER & GAMBLE');

**quit**;

**proc** **print** data = cust2;

**run**;

**data** rfm;

set cust2;

Recency = **1165** - Week;

**run**;

**proc** **sql**;

create table rfm1 as

select panid, min(Recency)as Recency, count(unique(week)) as Freq, sum(DOLLARS) as Monetary

from rfm

group by panid;

**quit**;

**proc** **print** data = rfm1;

**run**;

**proc** **corr** data = rfm1;

var Recency Freq Monetary;

**run**;

**proc** **rank** data=rfm1 out=rfm2 ties=low descending groups=**5**;

var Recency;

ranks R;

**run**;

**proc** **print** data = rfm4;

**run**;

**proc** **rank** data=rfm2 out=rfm3 ties=low groups=**5** ;

var Monetary ;

ranks M;

**run**;

**proc** **rank** data=rfm3 out=rfm4 ties=low groups=**5** ;

var Freq ;

ranks F;

**run**;

**data** rfm\_f;

set rfm4;

R+**1**;

F+**1**;

M+**1**;

**run**;

**proc** **stdize** data = rfm\_f out = rfm\_f1 method = RANGE;

var Monetary Recency freq R F M;

**run**;

**proc** **print** data = rfm\_f1;

**run**;

**proc** **cluster** data = rfm\_f1 method=average ccc pseudo rmsstd rsquare nonorm out= rfm\_f2;

id PANID;

var R F M;

**run**;

**proc** **tree** data=rfm\_f2 out=rfm\_f3 nclusters = **3**;

id PANID;

copy R F M ;

**run**;

**proc** **print** data = rfm\_f3;

**run**;

/\*\*\*\* Cluster - Demo \*\*\*\*/

**data** ads1;

set ads;

drop COUNTY HH\_AGE HH\_EDU HH\_OCC MALE\_SMOKE FEM\_SMOKE Language HISP\_FLAG HISP\_CAT HH\_Head\_Race\_\_RACE2\_ HH\_Head\_Race\_\_RACE3\_ Microwave\_Owned\_by\_HH ZIPCODE FIPSCODE market\_based\_upon\_zipcode IRI\_Geography\_Number EXT\_FACT;

**run**;

**proc** **sql**;

create table demo1\_cluster as

select a.\*,b.\*

from rfm\_f3 a left join ads1 b

on a.PANID = b.Panelist\_ID;

**quit**;

\*/proc sql;

\*/create table demo\_cluster\_1 as

\*/select \*

\*/from demo\_cluster

\*/where M NOT IN (0) AND R NOT IN (0);

\*/quit;

**proc** **print** data = demo1\_cluster;

**run**;

/\*

data demo\_cluster\_1;

set demo\_cluster;

if M = 2 AND R = 2 THEN Cluster = 'A';

else if M = 2 AND R = 1 THEN Cluster = 'B';

else if M = 1 AND R = 2 THEN Cluster = 'C';

else Cluster = 'D';

run;

\*/

**proc** **sort** data = demo\_cluster;

by Cluster;

**run**;

**proc** **export** data = demo1\_cluster

dbms = xlsx

outfile = "E:\SAS Temporary Files\sxt167530\master\_tables\master\_tables\Final Tables\demo1.xlsx";

**run**;

/\*\*\*\*\* Product with cluster \*\*\*\*/

**proc** **sql**;

create table prod\_cluster as select a.\*, b.l3, b.l5

from cust\_new a

left join blades b

on a.sy = b.sy

and a.ge = b.ge

and a.vend = b.vend

and a.item = b.item;

**quit**;

**proc** **sql**;

create table prod\_cluster\_1 as

select \*

from prod\_cluster

where l3 in ('PROCTER & GAMBLE');

**quit**;

**proc** **print** data = prod\_cluster\_1;

**run**;

**proc** **sql**;

create table prod\_cluster\_2 as select a.\*, b.Cluster

from prod\_cluster\_1 a

left join rfm\_f3 b

on a.PANID = b.PANID;

**quit**;

**proc** **export** data = prod\_cluster\_2

dbms = xlsx

outfile = "E:\SAS Temporary Files\sxt167530\master\_tables\master\_tables\Final Tables\prod1\_with\_cluster.xlsx";

**run**;