**HOMEWORK 3**

**SAS CODE**

Q1 Code**:**

/\* 1 \*/

libname q "H:\SAS\_Gaurav";

**data** a1;

set q.vacation19;

**run**;

**proc** **contents**; **run**;

/\* 1.a. \*/

/\* Running Linear Regression\*/

Title "Linear Regression";

**proc** **reg** data = a1;

model miles = age income kids;

**run**;

/\* 1.b. \*/

Title "White test for heteroskedasticity";

**proc** **reg** DATA = a1;

model miles = age income kids /spec;

output out=a2 r=resid;

**run**;

**quit**;

/\*1.c.\*/

**data** a2; set a2;

absr=abs(resid);

sqrr=resid\*resid;

**proc** **gplot** data=a2;

plot absr\*age absr\*income absr\*kids;

**run**;

**proc** **reg** data=a2;

model absr=income age kids;

output out=a3 p=shat;

**data** a3; set a3;

wt=**1**/(shat\*shat);

**proc** **reg** data=a3;

model miles = income age kids / clb spec;

weight wt;

**run**;

Q.2 Code

/\* 2. Reading input data \*/

**data** goods;

input week sales;

cards;

1 160

2 390

3 800

4 995

5 1250

6 1630

7 1750

8 2000

9 2250

10 2500

;

**run**;

/\* 2.1: Finding p, q, M, S\*, t\* \*/

**data** new;set goods;

cumd + sales;lagd =lag(cumd);sqrd=lagd\*lagd;

**proc** **reg** outest=coeff;model sales = lagd sqrd;**run**;

**proc** **print** data=coeff;**run**;

**data** a2;set coeff;

M=(-lagd-(sqrt(lagd\*lagd-**4**\*intercept\*sqrd)))/(**2**\*sqrd);

p=intercept/m;

q=p+lagd;

tstar=log(q/p)\***1**/(p+q);

sstar=M\*(p+q)\*(p+q)/(**4**\*q);

**proc** **print**;**run**;

/\* 2.2: Finding predicted sales in each period \*/

**data** new2;set new;

M=**26225.01**;p=**0.020581**;q=**0.33071**;

array nt{**10**} t1-t10 (**0** **0** **0** **0** **0** **0** **0** **0** **0** **0**);

do i = **1** to **10**;

Psales=p\*(M-nt[i])+ q\*(nt[i]/M)\*(M-nt[i]);

nt[i]=nt[i]+psales;

end;

**proc** **print** data=new2; var week sales Psales;

**run**;

/\* 2.3: plotting graph \*/

**proc** **gplot**;plot psales\*week sales\*week/overlay legend;**run**;

Q3. Code

**data** conjoint ;

input brand $ scent $ soft $ oz pr s1 s2 s3 s4 s5 ;

cards ;

complete fresh n 48 4.99 1 3 3 2 2

complete fresh y 32 2.99 1 3 3 5 5

complete lemon n 32 2.99 1 2 7 5 1

complete lemon y 64 3.99 1 9 5 8 1

complete U n 64 3.99 1 9 7 8 7

complete U y 48 4.99 1 3 3 2 3

Smile fresh n 64 2.99 1 9 9 9 6

Smile fresh y 48 3.99 1 7 7 6 5

Smile lemon n 48 3.99 1 7 7 6 1

Smile lemon y 32 4.99 1 1 1 1 1

Smile U n 32 4.99 1 1 3 1 2

Smile U y 64 2.99 1 9 3 9 9

Wave fresh n 32 3.99 7 1 7 4 5

Wave fresh y 64 4.99 5 5 3 3 2

Wave lemon n 64 4.99 5 5 5 3 1

Wave lemon y 48 2.99 9 9 5 7 1

Wave U n 48 2.99 9 9 5 7 7

Wave U y 32 3.99 7 1 5 4 5

Wave lemon n 64 2.99 8 9 6 9 3

Smile lemon n 32 4.99 2 1 3 2 1

Smile fresh y 48 2.99 2 8 4 5 5

complete U y 32 2.99 2 4 2 5 6

complete lemon y 48 3.99 2 6 6 6 1

;

**proc** **print** data =conjoint (obs=**5**);

**run**;

**proc** **transreg** data=conjoint utilities short outtest=Utils separators=' ';

ods select FitStatistics Utilities;

model identity(s1-s5) =

class(brand scent soft oz pr / zero=sum );

**run**;

/\*Importance \*/

**data** Importance;

set Utils(keep=\_depvar\_ Importance Label);

if n(Importance);

label = substr(label, **1**, index(label, ' '));

subject = substr(\_depvar\_ , **10**, **2**);

**run**;

**proc** **transpose** out=Importance2(drop=\_:);

by subject;

id Label;

**run**;

**proc** **print** data=Importance2;

**run**;

/\*Average Importance\*/

**proc** **means** data=Importance2;

**run**;

/\* Part-Worth Utilites \*/;

**data** Utilities;

set Utils(keep=\_depvar\_ Coefficient Label);

if n(Coefficient);

subject = substr(\_depvar\_ , **10**, **2**);

**run**;

**proc** **transpose** data =Utilities out=Utilities2(drop=\_:);

by subject;

id Label;

**run**;

**proc** **print** data=Utilities2;

**run**;

/\*Predicting using Logit\*/

**proc** **sql** ;

create table partialUtils as

select subject,

sum(brand\_\_complete,scent\_\_lemon,soft\_\_y,oz\_\_64,pr\_\_2\_99) as combi1 '' ,

sum(brand\_\_Smile,scent\_\_fresh,soft\_\_y,oz\_\_48,pr\_\_2\_99) as combi2 '' ,

sum(brand\_\_Smile,scent\_\_U,soft\_\_y,oz\_\_48,pr\_\_3\_99) as combi3 '' ,

sum(brand\_\_Wave,scent\_\_U,soft\_\_y,oz\_\_48,pr\_\_2\_99) as combi4 '' ,

sum(brand\_\_Smile,scent\_\_U,soft\_\_n,oz\_\_48,pr\_\_2\_99) as combi5 ''

from Utilities2;

**run**;

**quit**;

**proc** **sql**;

create table totalUtil as

select \*,

sum(exp(combi1),exp(combi2),exp(combi3),exp(combi4),exp(combi5)) as TotUtil ''

from partialUtils;

**run**;

**quit**;

**proc** **print** data = totalUtil;

**run**;

**proc** **sql** ;

create table Choice as

select subject ,

exp(combi1)/TotUtil as marketShare\_1 '' ,

exp(combi2)/TotUtil as marketShare\_2 '' ,

exp(combi3)/TotUtil as marketShare\_3 '' ,

exp(combi4)/TotUtil as marketShare\_4 '' ,

exp(combi5)/TotUtil as marketShare\_5 ''

from totalUtil;

**run**;

**quit**;

**proc** **print** data=Choice;

**run**;