\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

\* Program: H:\Practicum\tidal\_volume\workprogram\_xzhao.sas \*;

\* Date: 07/25/2015 \*;

\* Programmer: Xinyi Zhao \*;

\* Purpose: This program is to manipulate the tidal volume data \*;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

**PROC** **IMPORT** OUT= WORK.TV

DATAFILE= "H:\Practicum\tidal\_volume\tv.csv"

DBMS=CSV REPLACE;

GETNAMES=YES;

DATAROW=**2**;

**RUN**;

**proc** **contents** data=tv;

**run**;

\*\*\*\* mean, min and max tvs for each day of day 1, day 2 and day 3 \*\*\*\*;

**proc** **sort** data=tv;

by studyid day;

**run**;

**data** temp1;

set tv;

by studyid day;

retain init x **0**;

if first.studyid then do;

init=**0**;

x=day;

end;

if day gt x then do;

x=day;

init=init+**1**;

end;

if init lt **3** then output;

drop x init;

**run**;

**proc** **sql**;

create table t1 as

select distinct studyid, day,

avg(tvs) as day\_mean,

min(tvs) as day\_min,

max(tvs) as day\_max

from temp1

group by studyid, day;

**quit**;

\*\*\*\* mean tvs for the first 2 days \*\*\*\*;

**data** temp2;

set tv;

by studyid day;

retain init x **0**;

if first.studyid then do;

init=**0**;

x=day;

end;

if day gt x then do;

x=day;

init=init+**1**;

end;

if init lt **2** then output;

drop x init;

**run**;

**proc** **sql**;

create table t2 as

select distinct studyid,

avg(tvs) as mean\_2d,

min(tvs) as min\_2d,

max(tvs) as max\_2d

from temp2

group by studyid;

**quit**;

\*\*\*\* the first documented tvs on day 1 \*\*\*\*;

**proc** **sort** data=tv;

by studyid ts;

**run**;

**data** temp3;

set tv;

by studyid ts;

if first.studyid then fsttvs=tvs;

if fsttvs=**.** then delete;

**run**;

\*\*\*\* the number of consecutive days \*\*\*\*;

**data** temp4;

set tv;

by studyid day;

preday=lag(day);

retain count **1**;

if first.studyid then do;

count=**1**;

preday=**.**;

end;

daydiff=day-preday;

if daydiff=**1** then count=count+**1**;

if last.studyid;

**run**;

**proc** **sql**;

create table t3 as

select t2.\*,

temp3.fsttvs,

temp4.count

from t2, temp3, temp4

where t2.studyid=temp3.studyid=temp4.studyid;

**quit**;

**proc** **sql**;

create table anl as

select \*,

day\_max - day\_min as diff1,

day\_max - day\_mean as diff2

from t1;

**quit**;

**proc** **sort** data=anl;

by studyid day;

**run**;

\* Data for Day 1;

**data** anl1;

set anl;

by studyid day;

if first.studyid;

**run**;

\* Data for Day 2;

**data** anl2\_1;

set anl;

by studyid day;

if first.studyid then delete;

**run**;

**data** anl2;

set anl2\_1;

by studyid day;

if first.studyid;

**run**;

\* Data for Day 3;

**data** anl3\_1;

set anl;

by studyid day;

if first.studyid then delete;

**run**;

**data** anl3\_2;

set anl3\_1;

by studyid day;

if first.studyid then delete;

**run**;

**data** anl3;

set anl3\_2;

by studyid day;

if first.studyid;

**run**;

\* Macro for analysis for each day;

**%macro** anld(dsn);

/\*Test for difference between day max and day min\*/

proc univariate data=&dsn;

var diff1;

histogram diff1/normal;

probplot diff1;

run;

proc ttest data=&dsn h0=**49**;

paired day\_max\*day\_min;

run;

/\*Test for difference between day max and day mean\*/

proc univariate data=&dsn;

var diff2;

histogram diff2/normal;

probplot diff2;

run;

proc ttest data=&dsn h0=**49**;

paired day\_max\*day\_mean;

run;

**%mend**;

options mprint symbolgen;

%***anld***(anl1); \* Analysis for Day 1;

%***anld***(anl2); \* Analysis for Day 2;

%***anld***(anl3); \* Analysis for Day 3;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

\* Program: H:\Practicum\tidal\_volume\workprogram2\_xzhao.sas \*;

\* Date: 11/18/2015 \*;

\* Programmer: Xinyi Zhao \*;

\* Purpose: This program is for the analysis of the scores data \*;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

libname score "H:\Practicum\tidal\_volume\final analysis";

**PROC** **IMPORT** OUT= WORK.icu

DATAFILE= "H:\Practicum\tidal\_volume\final analysis\Overall

patient safety domains by ICU\_xzhao 8.9.xlsx"

DBMS=EXCEL REPLACE;

RANGE="Sheet1$";

GETNAMES=YES;

MIXED=NO;

SCANTEXT=YES;

USEDATE=YES;

SCANTIME=YES;

**RUN**;

**data** icu1;

set icu;

by ICU;

if last.ICU;

rename Pct\_positive\_response=scr;

keep ICU Pct\_positive\_response;

**run**;

**proc** **sort** data=score.scores;

by icu studyid day;

**run**;

\*------------------------------------------------------------------;

\* Merge patient safety score data into the main study dataset ;

\*------------------------------------------------------------------;

**data** score2;

merge score.scores(in=a) icu1(in=b);

by icu;

if a;

label scr="Patient Safety Score";

blackrace=**0**;

otherrace=**0**;

if race="Black" then blackrace=**1**; /\*ref=White\*/

if race="Other" then otherrace=**1**;

**run**;

**proc** **freq** data=score2;

tables icu\*scr/list;

**run**;

**proc** **freq** data=score2;

tables race\*blackrace\*otherrace/list;

**run**;

**proc** **freq** data=score2;

tables scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw;

**run**;

**proc** **contents** data=score2;

**run**;

\*-------------------------------;

\* Crude Model ;

\*-------------------------------;

**proc** **logistic** data=score2 descending;

model vae = scr/rl;

**run**;

\*----------------------------------------;

\* Fully-adjusted Model ;

\*----------------------------------------;

**proc** **logistic** data=score2 descending;

model vae = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw/rl;

**run**;

\*------------------------------------------------;

\* Model Selection (predictor screening) ;

\*------------------------------------------------;

\* backwards elimination method;

**proc** **logistic** data=score2 descending;

model vae = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw/ include=**1** selection=backward slstay=**0.05**;

**run**;

\* forward selection method;

**proc** **logistic** data=score2 descending;

model vae = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw/ include=**1** selection=forward slentry=**0.05**;

**run**;

\* stepwise selection method;

**proc** **logistic** data=score2 descending;

model vae = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw/ include=**1** selection=stepwise slstay=**0.05** slentry=**0.05**;

**run**;

\*----------------------------------------;

\* Final adjusted Model ;

\*----------------------------------------;

**proc** **logistic** data=score2 descending;

model vae = scr blackrace otherrace RBC tvpbw/rl;

**run**;