**STA 504**

**HomeWork\_10**

**Lina Lee**

**Number 1**

**SAS code**

/\*header

Purpose: Statistics on the number of flights and passengers leaving

12 major airports in the United States.

Input: airtraffic.sas7bdat/

\*/

libname HW10 "C:\Users\linal\Desktop\2018\STA502";

ods rtf file="C:\Users\linal\Desktop\2018\STA502\HW10\problem1a" bodytitle style=journal;

data airtraffic;

set HW10.airtraffic;

run;

proc sort data=airtraffic;

by airline year quarter;

run;

%let year=1991;

proc report data=airtraffic out=airdata; where year=&year;

column airline year quarter BOSFlights BOSPassengers;

define airline/group;

define year/group;

define quarter/group;

define BOSFlights/analysis sum "The number of flight";;

define BOSPassengers/analysis sum"the number of passengers";

run;

title "The sum of the flights and the sum of the passengers for each year and quarter per airline in 1991 for Boston airport";

proc print data=airdata(firstobs=18 obs=25);

run;

proc sql;

create table a as

select airline, year, quarter, divide(BOSPassengers,BOSFlights) as ratio1, round(divide(BOSPassengers,BOSFlights)) as ratio

from airdata;quit;

proc sql;

create table b as

select airline, year,quarter, ratio from a

group by quarter

having ratio=max(ratio);

quit;

title "the airline with the highest number of passengers per flight for each quarters of year 1991 ";

proc print data=b;

run;

ods rtf close;

%MACRO air\_analysis(flights=,passengers=,year=,yearto=);

%do year=&year %to &yearto;

proc report data=tmp1.airtraffic out=airdata; where year=&year;

column airline year quarter &Flights &Passengers;

define airline/group;

define year/group;

define quarter/group;

define &Flights/analysis sum "The number of flight";;

define &Passengers/analysis sum"the number of passengers";

run;

proc sql;

create table a as

select airline, year, quarter,round(divide(&Passengers,&Flights)) as ratio label=”Passengers per flight”

from airdata;quit;

proc sql;

create table data&year as

select airline, year, quarter, ratio from a

group by quarter

having ratio=max(ratio);

quit;

%end;

%MEND air\_analysis;

%*air\_analysis*(Flights=ORDFlights,Passengers=ORDPassengers,year=2000,yearto=2010);

proc sql;

title 'the airlines of highest passengers per flight for each quarters of year 1991';

create table combined as

select \* from data2000

union all

select \* from data2001

union all

select \* from data2002

union all

select \* from data2003

union all

select \* from data2004

union all

select \* from data2005

union all

select \* from data2006

union all

select \* from data2007

union all

select \* from data2008

union all

select \* from data2009

union all

select \* from data2010;

quit;

ods rtf file="C:\Users\linal\Desktop\2018\STA502\HW10\problem1-c" bodytitle style=journal;

title "the airline of the highest number of passengers for each quarter for year from 2000 to 2010 for Chicago airport";

proc print data=combined;

run;

ods rtf close;

**result:**

1. ***The sum of the flights and the sum of the passengers for each year and quarter per airline in 1991 for Boston airport***

| *Obs* | *Airline* | *Year* | *Quarter* | *BOSFlights* | *BOSPassengers* |
| --- | --- | --- | --- | --- | --- |
| *18* | Aloha Air Cargo | 1991 | 2 | . | . |
| *19* | Aloha Air Cargo | 1991 | 3 | . | . |
| *20* | Aloha Air Cargo | 1991 | 4 | . | . |
| *21* | America West Airlines Inc. | 1991 | 1 | 263 | 31141 |
| *22* | America West Airlines Inc. | 1991 | 2 | 273 | 39959 |
| *23* | America West Airlines Inc. | 1991 | 3 | 286 | 37188 |
| *24* | America West Airlines Inc. | 1991 | 4 | 386 | 37910 |
| *25* | American Airlines Inc. | 1991 | 1 | 1995 | 224973 |

1. ***The airline with the highest number of passengers per flight for each quarters of year 1991***

| *Obs* | *Airline* | *Year* | *Quarter* | *Passengers per flight* |
| --- | --- | --- | --- | --- |
| *1* | America West Airlines Inc. | 1991 | 1 | 118 |
| *2* | America West Airlines Inc. | 1991 | 2 | 146 |
| *3* | United Air Lines Inc. | 1991 | 3 | 133 |
| *4* | American Airlines Inc. | 1991 | 4 | 115 |

1. ***The airline of the highest number of passenger for each quarter for year from 2000 to 2010 for the Chicago airport***

| *Obs* | *Airline* | *Year* | *Quarter* | *Passengers per flight* |
| --- | --- | --- | --- | --- |
| *1* | Delta Air Lines Inc. | 2000 | 1 | 99 |
| *2* | Delta Air Lines Inc. | 2000 | 2 | 118 |
| *3* | Delta Air Lines Inc. | 2000 | 3 | 120 |
| *4* | Spirit Air Lines | 2000 | 4 | 114 |
| *5* | Spirit Air Lines | 2001 | 1 | 123 |
| *6* | ATA Airlines d/b/a ATA | 2001 | 2 | 172 |
| *7* | ATA Airlines d/b/a ATA | 2001 | 3 | 257 |
| *8* | National Airlines | 2001 | 4 | 121 |
| *9* | Spirit Air Lines | 2002 | 1 | 113 |
| *10* | National Airlines | 2002 | 1 | 113 |
| *11* | National Airlines | 2002 | 2 | 122 |
| *12* | Casino Express | 2002 | 3 | 119 |
| *13* | Spirit Air Lines | 2002 | 4 | 118 |
| *14* | America West Airlines Inc. | 2003 | 1 | 116 |
| *15* | Casino Express | 2003 | 2 | 120 |
| *16* | Spirit Air Lines | 2003 | 3 | 134 |
| *17* | Spirit Air Lines | 2003 | 4 | 132 |
| *18* | Spirit Air Lines | 2004 | 1 | 119 |
| *19* | America West Airlines Inc. | 2004 | 2 | 125 |
| *20* | America West Airlines Inc. | 2004 | 3 | 130 |
| *21* | USA 3000 Airlines | 2004 | 4 | 127 |
| *22* | America West Airlines Inc. | 2005 | 1 | 126 |
| *23* | USA 3000 Airlines | 2005 | 2 | 141 |
| *24* | USA 3000 Airlines | 2005 | 3 | 131 |
| *25* | USA 3000 Airlines | 2005 | 4 | 138 |
| *26* | Spirit Air Lines | 2006 | 1 | 148 |
| *27* | USA 3000 Airlines | 2006 | 2 | 132 |
| *28* | Alaska Airlines Inc. | 2006 | 3 | 138 |
| *29* | USA 3000 Airlines | 2006 | 4 | 125 |
| *30* | Spirit Air Lines | 2007 | 1 | 149 |
| *31* | Alaska Airlines Inc. | 2007 | 2 | 139 |
| *32* | Alaska Airlines Inc. | 2007 | 3 | 140 |
| *33* | USA 3000 Airlines | 2007 | 4 | 147 |
| *34* | USA 3000 Airlines | 2008 | 1 | 140 |
| *35* | USA 3000 Airlines | 2008 | 2 | 145 |
| *36* | USA 3000 Airlines | 2008 | 3 | 140 |
| *37* | USA 3000 Airlines | 2008 | 4 | 140 |
| *38* | USA 3000 Airlines | 2009 | 1 | 131 |
| *39* | Alaska Airlines Inc. | 2009 | 2 | 142 |
| *40* | Alaska Airlines Inc. | 2009 | 3 | 143 |
| *41* | USA 3000 Airlines | 2009 | 4 | 137 |
| *42* | USA 3000 Airlines | 2010 | 1 | 129 |
| *43* | Alaska Airlines Inc. | 2010 | 2 | 137 |
| *44* | Alaska Airlines Inc. | 2010 | 3 | 140 |
| *45* | USA 3000 Airlines | 2010 | 4 | 136 |

**Number 2**

**SAS code**

/\*header

Purpose: Summary for loan appllication using Macro

Input: loanapp.sas7bdat/

\*/

libname HW10 "C:\Users\linal\Desktop\2018\STA502";

ods rtf file="C:\Users\linal\Desktop\2018\STA502\HW10\problem2\_\_" bodytitle style=journal;

data loanapp;

set HW10.loanapp;

run;

%macro loan\_analysis(type=,form=,des=,var1=,form1=,des1=,var2=,form2=,des2=,branchnb=);

proc format;

value bname 1="LIV925"

2="SV408"

3="SL0805"

4="GLN626"

5="COR760"

run;

proc format;

value aname 1="Primary Residence"

2="Secondary Residence"

3="Investment or Rental"

4="Commercial Property"

run;

proc format;

value cname 1=Conventional

2=VA

3=FHA

4=Farmers Home Admin

5=Other

run;

title "Summary for Branch &branchnb";

proc sql;

select &type as type format=&form label=&des

,sum(loanapproved) as number "Number of loan approvals" ,

avg(&var1) as var1 format=&form1 label=&des1,

median(&var2) as var2 format=&form2 label=&des2

from loanapp

where loanapproved=1 AND branch=&branchnb

group by &type;

quit;

%mend;

%*loan\_analysis*(type=PropType,form=aname.,des="property type",var1=LoanAmt,form1=dollar10.2,des1="The mean loan amount "

,var2=PercentDown,form2=percent10.2,des2="The median down payment percentage",branchnb=1);

%*loan\_analysis*(type=MortApp,form=cname.,des="Morgage type",var1=CreditScore,form1=10.,des1="The mean credit score "

,var2=Price,form2=dollar14.3,des2="The median purchase price",branchnb=3);

ods rtf close;

**Result:**

1. ***Summary for Branch 1***

| *property type* | *Number of loan approvals* | *The mean loan amount* | *The median down payment percentage* |
| --- | --- | --- | --- |
| Primary Residence | 558 | $427,613.44 | 14.72% |
| Secondary Residence | 59 | $386,466.10 | 13.43% |
| Investment or Rental | 73 | $412,416.44 | 15.05% |
| Commercial Property run | 28 | $383,064.29 | 16.83% |

1. ***Summary for Branch 3***

| *Morgage type* | *Number of loan approvals* | *The mean credit score* | *The median purchase price* |
| --- | --- | --- | --- |
| Conventional | 317 | 718 | $366,500.000 |
| VA | 55 | 726 | $422,300.000 |
| FHA | 19 | 711 | $273,900.000 |
| Farmers Home Admin | 20 | 733 | $316,250.000 |
| Other run | 23 | 707 | $521,400.000 |

**3. Answers for multiple choices**

(a)- A (b)-A (c)-D (d)-B (e)- D