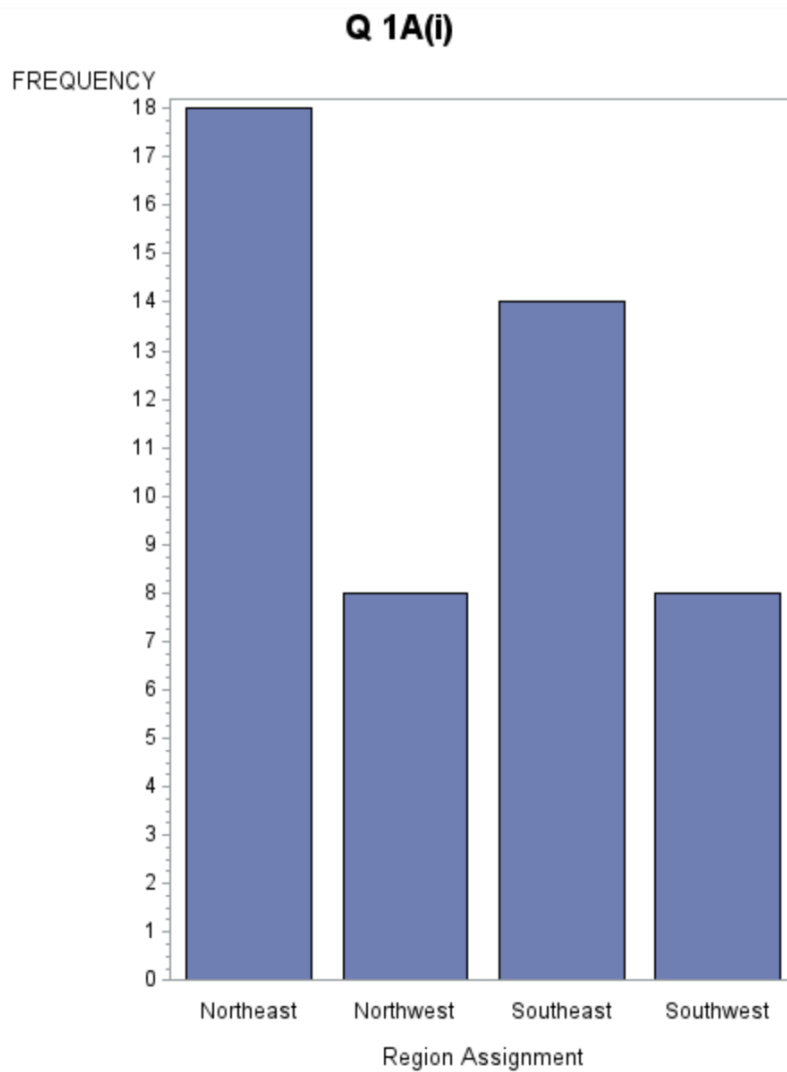**QUESTION 1A**:

i)

```
option nodate;
libname datain 'C:\Users\921460888\Documents\My SAS Files';
data HW1;
set datain.HW1;
run;
proc print data = HW1;
run;


proc gchart data = HW1; /*Bar Graph*/
title "Q 1A(i)";
vbar region;
run;
```
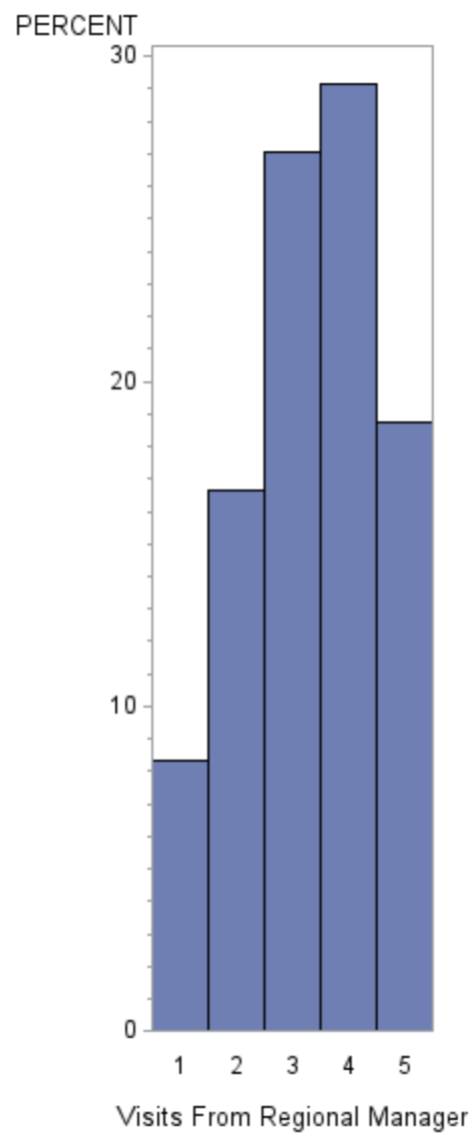

Q 1A(i)

ii)

```
/****/

proc gchart data = HW1;
  title "Q 1A(ii)";
  vbar visits/discrete
  space = 0 |
  type = percent;
  run;
```

Q 1A(ii)

Visits From Regional Manager

iii)

```
/****/
proc gchart data = HW1;
  title "Q 1A(iii)";
  vbar visits/discrete
  space = 0
  subgroup = region; /*group by region*/
  run;
```

Q 1A(iii)

FREQUENCY

Visits From Regional Manager

Region Assignment — Northeast — Northwest — Southeast — Southwest
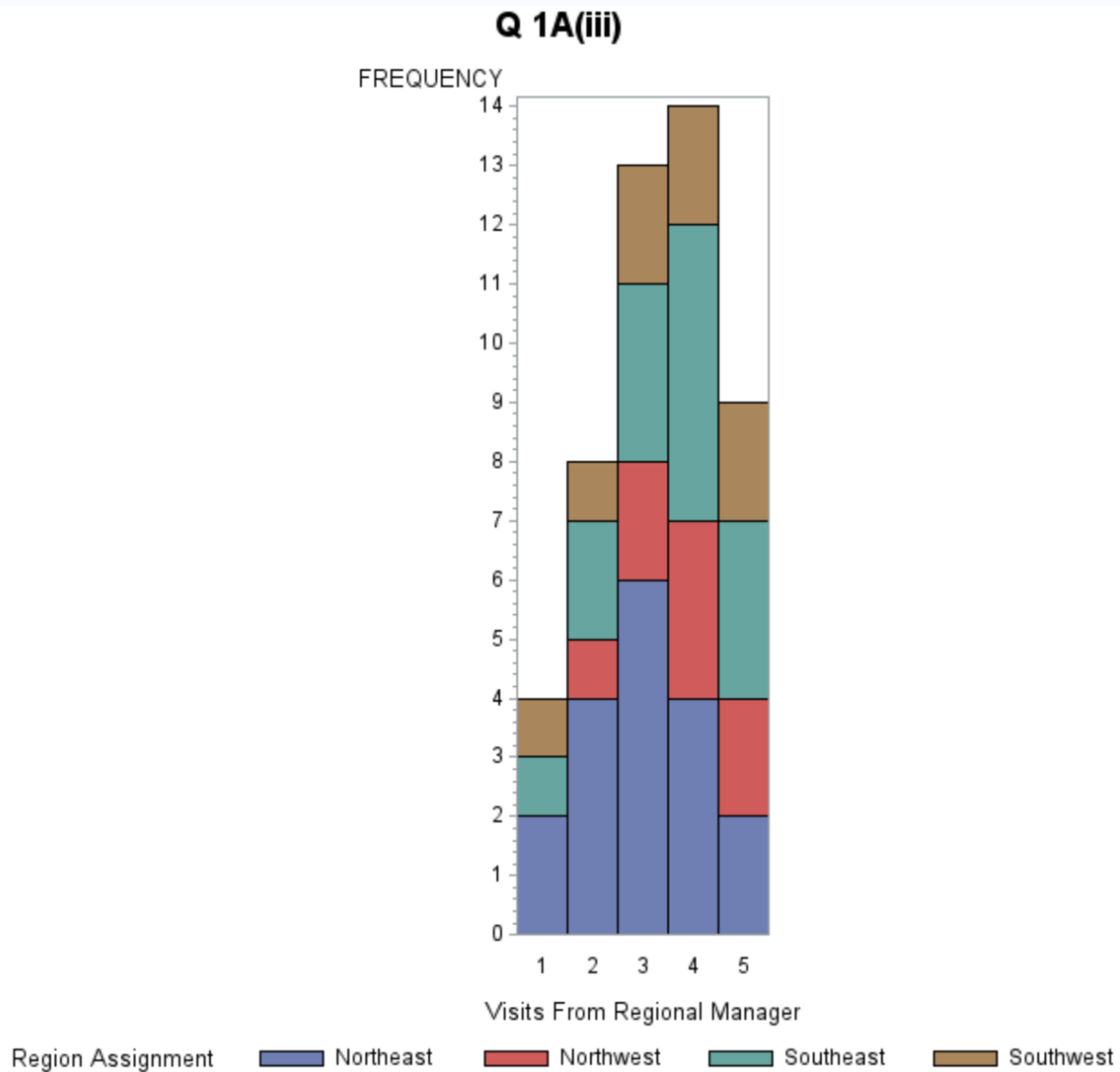
iv)

```
/****/

proc gchart data = HW1;
  title "Q 1A (iv)";
  vbar region /
  subgroup = visits;
  run;
```

Q 1A (iv)

v)
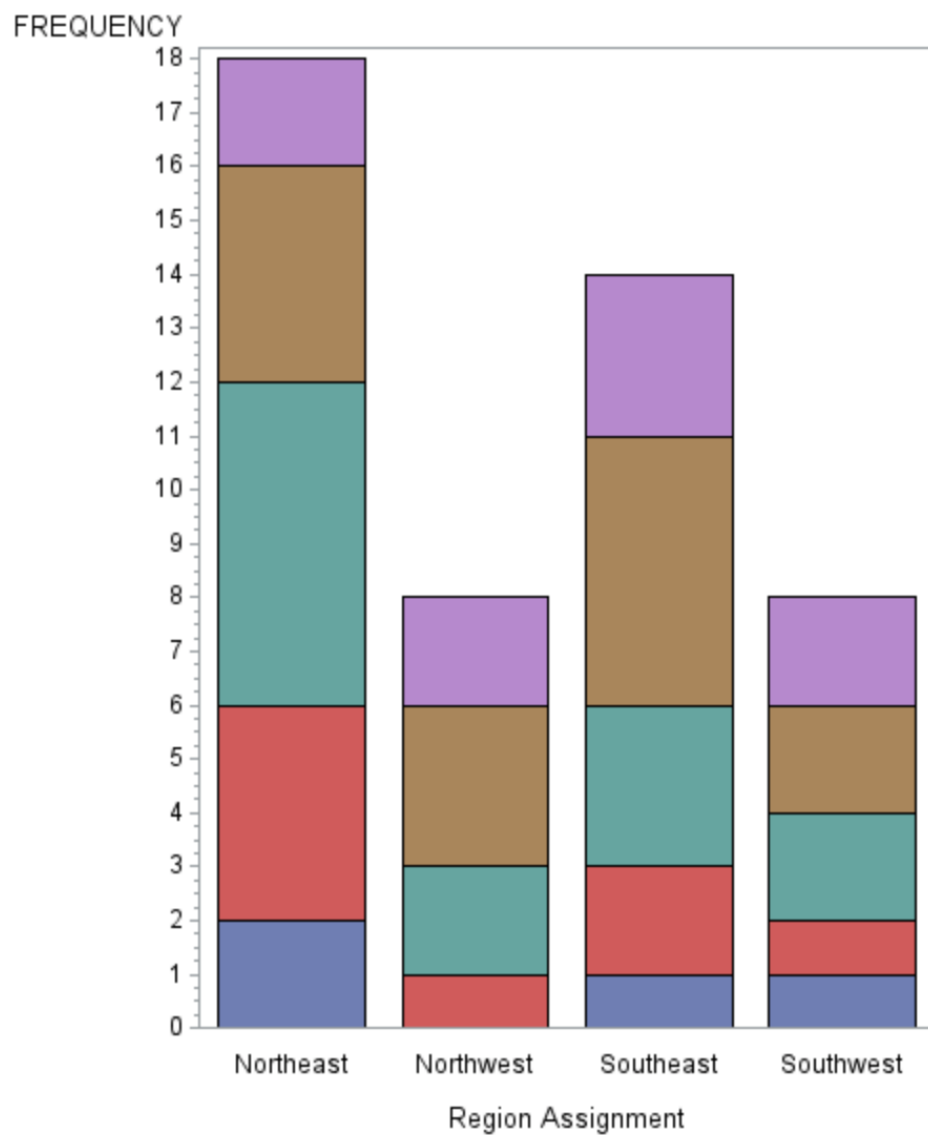
```
/****/

proc gchart data = HW1;
title "Q 1A (v)";
vbar region /
sumvar = sale;
run;
```

Q 1A (v)

Gross Sales For Last Quarter

Region Assignment
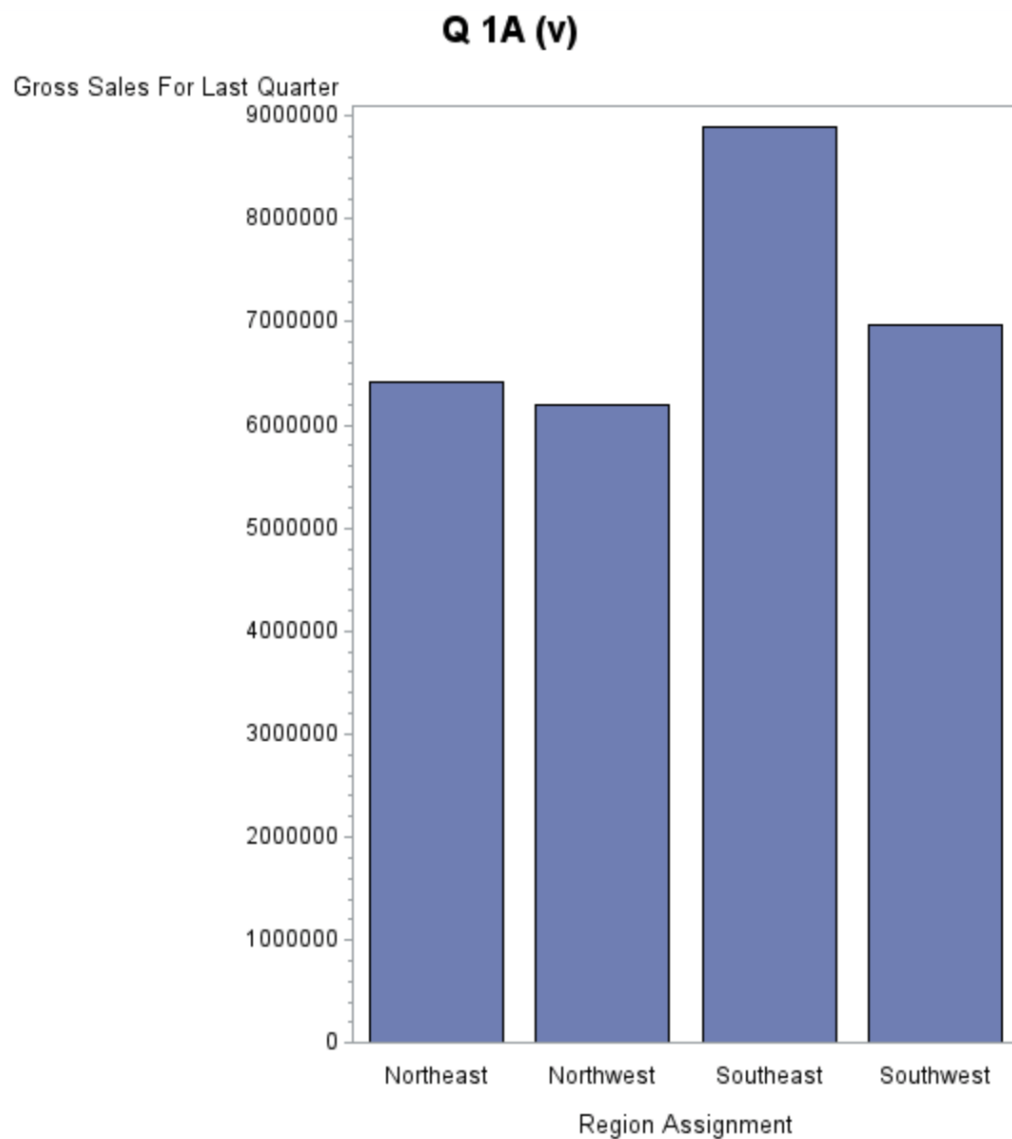
vi)

```
/****/

proc gchart data = HW1;
 title "Q 1A (vi)";
 vbar region /
 sumvar = expenses; /* Same thing as part v but switch sale for expenses*/
 run;
```


Q 1A (vi)

Advertising Expenses For Last Quarter
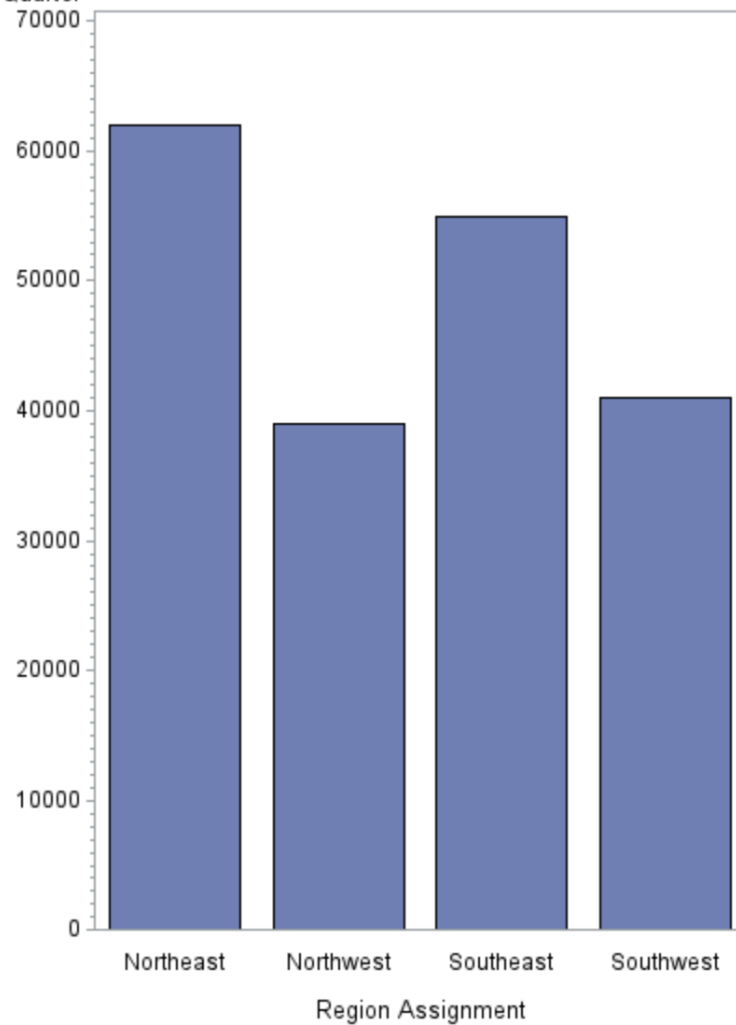
vii)

```
/****/

proc gchart data = HW1;
 title "Q 1A (vii)";
 block region /
 group = visits
 sumvar = sale type = mean;
 run;
/************************************/
```

Q 1A (vii)

BLOCK CHART OF MEAN

Visits From Regional Manager

	Northeast	Northwest	Southeast	Southwest
5	260000	1170000	1033333	1670000
4	322500	603333.3	632000	675000
3	515000	625000	510000	610000
2	302500	800000	425000	780000
1	150000		260000	290000

Region Assignment
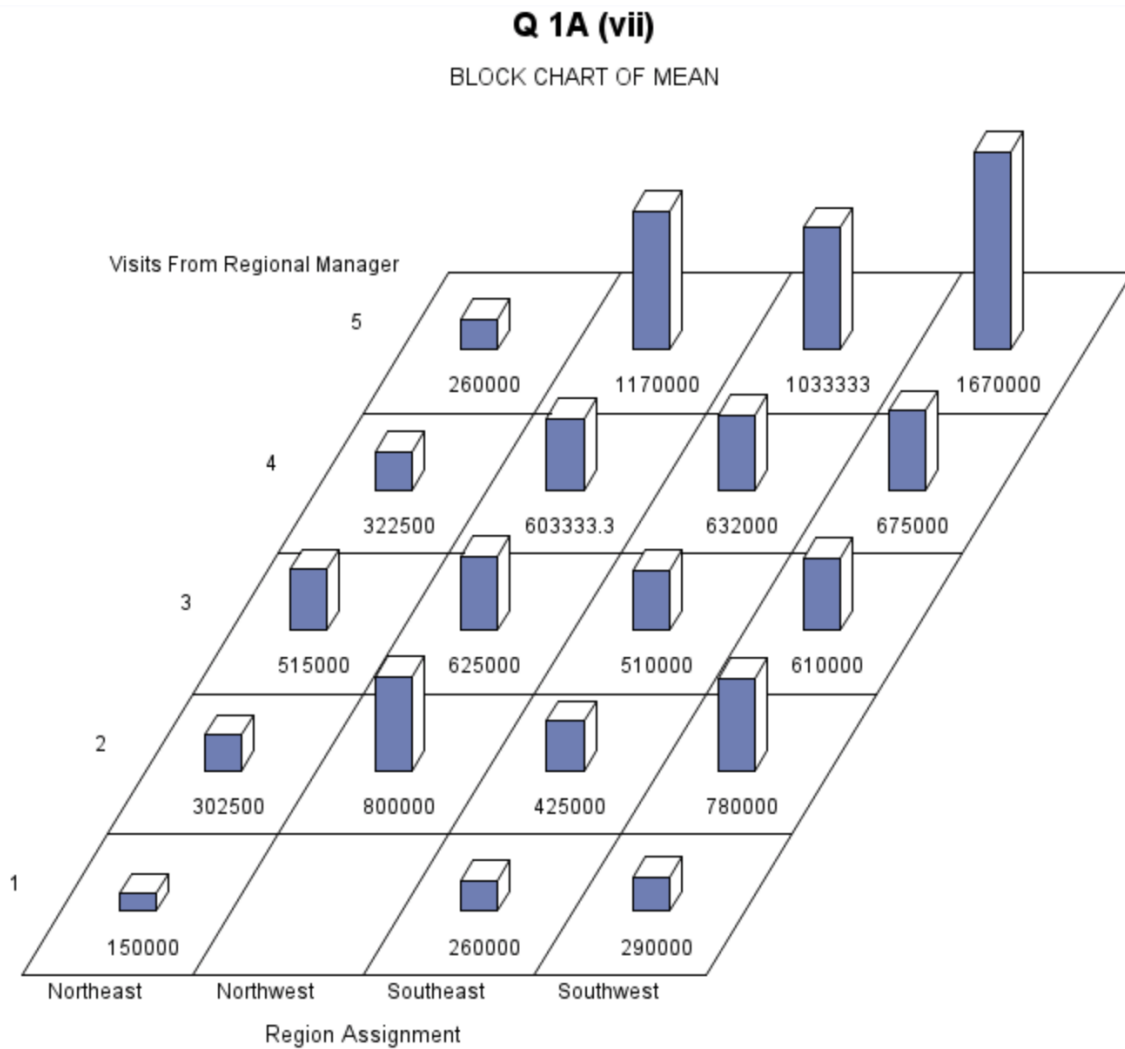
QUESTION 1B:

i)

```
proc print data = HW1 noobs;
  title "Q 1B (i)";
  where Region = "Northeast"; /*Question is asking to "print only Northeast Region"*/
  run;
```

Q 1B (i)

state	region	visits	salesman	sale	expenses
Delaware	Northeast	1	1	120000	1000
Rhode Island	Northeast	1	1	180000	1000
Idiana	Northeast	2	2	340000	2000
Maine	Northeast	2	1	300000	1000
New Hampshire	Northeast	2	2	290000	1000
Vermont	Northeast	2	2	280000	1000
Connecticut	Northeast	3	1	530000	3000
Maryland	Northeast	3	3	600000	4000
Massachusetts	Northeast	3	2	510000	5000
New Jersey	Northeast	3	3	520000	6000
Ohio	Northeast	3	4	450000	5000
Pennsylvania	Northeast	3	5	480000	6000
Iowa	Northeast	4	2	360000	3000
Michigan	Northeast	4	4	300000	6000
Minnesota	Northeast	4	3	320000	2000
Wisconsin	Northeast	4	3	310000	3000
Illinois	Northeast	5	4	240000	4000
NewYork	Northeast	5	4	280000	8000

ii)

```
proc print data = HW1 noobs;
  title "Q 1B (ii)";
  where visits ~= 5; /*All visits that are not equal to 5*/
  run;
/****/
```

Q 1 B (ii)

state	region	visits	salesman	sale	expenses
Delaware	Northeast	1	1	120000	1000
Rhode Island	Northeast	1	1	180000	1000
West Virginia	Southeast	1	1	250000	2000
Nevada	Southwest	1	1	290000	1000
Idiana	Northeast	2	2	340000	2000
Maine	Northeast	2	1	300000	1000
New Hampshire	Northeast	2	2	290000	1000
Vermont	Northeast	2	2	280000	1000
Nebraska	Northwest	2	3	800000	2000
Kentucky	Southeast	2	1	390000	2000
Virginia	Southeast	2	3	460000	4000
Utah	Southwest	2	3	780000	6000
Connecticut	Northeast	3	1	530000	3000
Maryland	Northeast	3	3	600000	4000
Massachusetts	Northeast	3	2	510000	5000
New Jersey	Northeast	3	3	520000	6000
Ohio	Northeast	3	4	460000	5000
Pennsylvania	Northeast	3	5	480000	6000
Oregon	Northwest	3	4	600000	5000
Washington	Northwest	3	4	660000	6000
Arkansas	Southeast	3	1	520000	1000
Lousiana	Southeast	3	2	480000	4000
Missouri	Southeast	3	3	530000	5000
New Mexico	Southwest	3	2	680000	4000
Oklahoma	Southwest	3	3	540000	4000
Iowa	Northeast	4	2	360000	3000
Michigan	Northeast	4	4	300000	6000
Minnesota	Northeast	4	3	320000	2000
Wisconsin	Northeast	4	3	310000	3000
Idaho	Northwest	4	3	600000	2000
Montana	Northwest	4	2	620000	3000
Wyoming	Northwest	4	2	590000	5000
Alabama	Southeast	4	2	600000	4000
Arizona	Southeast	4	3	810000	5000
Georgia	Southeast	4	2	580000	2000
Mississippi	Southeast	4	2	620000	4000
Tennessee	Southeast	4	2	550000	3000
Colorado	Southwest	4	3	650000	4000
Kansas	Southwest	4	3	700000	4000

iii)

```
/****/

proc print data = HW1;
  title "Q 1B (iii)";
  where sale > 700000 and
  expenses < 5000; /*Gross sales larger than 700k and Ad expenses were less than 5k*/
  run; /* It looks like Nebraska was the only state qualified given these requirments*/
```

Q 1B (iii)

Obs	state	region	visits	salesman	sale	expenses
9	Nebraska	Northwest	2	3	800000	2000

iv)

```
/****/

proc print data = HW1 noobs;
  title "Q 1B (iv)";
  where Region = "Southeast"; /* Only Southeast*/
  var state region; /* State name and region*/
  run;
```

Q 1B (iv)

state	region
West Virginia	Southeast
Kentucky	Southeast
Virginia	Southeast
Arkansas	Southeast
Lousiana	Southeast
Missouri	Southeast
Alabama	Southeast
Arizona	Southeast
Georgia	Southeast
Missisippi	Southeast
Tennessee	Southeast
Florida	Southeast
North Carolina	Southeast
South Carolina	Southeast

v)

```
/****/
proc print data = HW1;
title "Q 1B (v)";
where state not like "M%" and
state not like "N%" and
state not like "T%"; /* States not containing starting letters M, N, and T*/
run;
```

Q 1B (v)

state	region	visits	salesman	sale	expenses
Delaware	Northeast	1	1	120000	1000
Rhode Island	Northeast	1	1	180000	1000
West Virginia	Southeast	1	1	260000	2000
Idiana	Northeast	2	2	340000	2000
Vermont	Northeast	2	2	280000	1000
Kentucky	Southeast	2	1	390000	2000
Virginia	Southeast	2	3	460000	4000
Utah	Southwest	2	3	780000	6000
Connecticut	Northeast	3	1	530000	3000
Ohio	Northeast	3	4	450000	5000
Pennsylvania	Northeast	3	5	480000	6000
Oregon	Northwest	3	4	600000	5000
Washington	Northwest	3	4	650000	6000
Arkansas	Southeast	3	1	520000	1000
Lousiana	Southeast	3	2	480000	4000
Oklahoma	Southwest	3	3	540000	4000
Iowa	Northeast	4	2	360000	3000
Wisconsin	Northeast	4	3	310000	3000
Idaho	Northwest	4	3	600000	2000
Wyoming	Northwest	4	2	590000	5000
Alabama	Southeast	4	2	600000	4000
Arizona	Southeast	4	3	810000	5000
Georgia	Southeast	4	2	580000	2000
Colorado	Southwest	4	3	650000	4000
Kansas	Southwest	4	3	700000	4000
Illinois	Northeast	5	4	240000	4000
South Dakota	Northwest	5	3	1100000	8000
Florida	Southeast	5	4	950000	5000
South Carolina	Southeast	5	3	1120000	7000
California	Southwest	5	6	1500000	9000

QUESTION 1C:

i)

```
/****/
proc sort data = HW1;
by region expenses;
run;
proc print data = HW1;
title "Q 1C (i)";
by region;
var state salesman expenses;
sum expenses;
run;
```

Q 1C (i)

Region Assignment=Northeast

Obs	state	salesman	expenses
1	Delaware	1	1000
2	Rhode Island	1	1000
3	Maine	1	1000
4	New Hampshire	2	1000
5	Vermont	2	1000
6	Idiana	2	2000
7	Minnesota	3	2000
8	Connecticut	1	3000
9	Iowa	2	3000
10	Wisconsin	3	3000
11	Maryland	3	4000
12	Illinois	4	4000
13	Massachusetts	2	5000
14	Ohio	4	5000
15	New Jersey	3	6000
16	Pennsylvania	5	6000
17	Michigan	4	6000
18	NewYork	4	8000
region			62000

Region Assignment=Northwest

Obs	state	salesman	expenses
19	Nebraska	3	2000
20	Idaho	3	2000
21	Montana	2	3000
22	Oregon	4	5000
23	Wyoming	2	5000
24	Washington	4	6000
25	North Dakota	3	8000
26	South Dakota	3	8000
region			39000

Region Assignment=Southeast

Obs	state	salesman	expenses
27	Arkansas	1	1000
28	West Virginia	1	2000
29	Kentucky	1	2000
30	Georgia	2	2000
31	Tennessee	2	3000
32	Virginia	3	4000
33	Lousiana	2	4000
34	Alabama	2	4000
35	Missisippi	2	4000
36	Missouri	3	5000
37	Arizona	3	5000
38	Florida	4	5000
39	North Carolina	2	7000
40	South Carolina	3	7000
region			55000

Region Assignment=Southwest

Obs	state	salesman	expenses
41	Nevada	1	1000
42	New Mexico	2	4000
43	Oklahoma	3	4000
44	Colorado	3	4000
45	Kansas	3	4000
46	Utah	3	6000
47	California	6	9000
48	Texas	7	9000
region			41000
			197000

ii)

```
/****/
proc sort data = HW1;
  by visits;
  run;
proc print data = HW1 noobs;
  title "Q 1C (ii)";
  by visits;
  var state;
  run;
/********************************/
```

Q 1C (ii)

Visits From Regional Manager=1

state
Delaware
Rhode Island
West Virginia
Nevada

Visits From Regional Manager=2

state
Maine
New Hampshire
Vermont
Idiana
Nebraska
Kentucky
Virginia
Utah

Visits From Regional Manager=3

state
Connecticut
Maryland
Massachusetts
Ohio
New Jersey
Pennsylvania
Oregon
Washington
Arkansas
Lousiana
Missouri
New Mexico
Oklahoma

Visits From Regional Manager=4

state
Minnesota
Iowa
Wisconsin
Michigan
Idaho
Montana
Wyoming
Georgia
Tennessee
Alabama
Missisippi
Arizona
Colorado
Kansas

Visits From Regional Manager=5

state
Illinois
New York
North Dakota
South Dakota
Florida
North Carolina
South Carolina
California
Texas