Stats 506, F18, Problem Set 1

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Question 1

Part A

i.

```
cat ./recs2015_public_v3.csv|cut -b 10|grep ^3|wc -l
```

```
##      2010
```

ii.

```
cat ./recs2015_public_v3.csv|cut -d , -f 1,479-575 >recs_comp.txt|gzip recs_comp.txt
```

Part B

i.

```
##       794
##      1327
##      2010
##      1555
```

ii.

```
## "1","1"
## "1","2"
## "2","3"
## "2","4"
## "3","5"
## "3","6"
## "3","7"
## "4","8"
## "4","9"
## "4","10"
```

Question 2

a.

Table 1: Airlines responsible for at least 1% of the flights

airlines
Endeavor Air Inc.
American Airlines Inc.
JetBlue Airways
Delta Air Lines Inc.
ExpressJet Airlines Inc.
AirTran Airways Corporation
Envoy Air
United Air Lines Inc.
US Airways Inc.
Virgin America
Southwest Airlines Co.

b.

Table 2: The number and percent of annual flights in the first 10 months of 2013

carrier	number	percent	lwr of CI	upr of CI
Endeavor Air Inc.	15232	5.4	5.3	5.5
American Airlines Inc.	27447	9.8	9.6	9.9
JetBlue Airways	45605	16.2	16.1	16.3
Delta Air Lines Inc.	40168	14.3	14.1	14.4
ExpressJet Airlines Inc.	45395	16.1	16.0	16.3
AirTran Airways Corporation	2845	1.0	1.0	1.0
Envoy Air	22202	7.9	7.8	8.0
United Air Lines Inc.	48880	17.4	17.2	17.5
US Airways Inc.	17232	6.1	6.0	6.2
Virgin America	4235	1.5	1.5	1.6
Southwest Airlines Co.	10143	3.6	3.5	3.7

Table 3: The number and percent of annual flights in the first 10 months of 2014

carrier	number	percent	lwr of CI	upr of CI
American Airlines Inc.	26302	10.4	10.3	10.5
JetBlue Airways	44479	17.6	17.4	17.7
Delta Air Lines Inc.	41683	16.5	16.3	16.6
ExpressJet Airlines Inc.	39819	15.7	15.6	15.9
AirTran Airways Corporation	1251	0.5	0.5	0.5
Envoy Air	18559	7.3	7.2	7.4
United Air Lines Inc.	46267	18.3	18.1	18.4
US Airways Inc.	16750	6.6	6.5	6.7
Virgin America	4797	1.9	1.8	1.9

carrier	number	percent	lwr of CI	upr of CI
Southwest Airlines Co.	11902	4.7	4.6	4.8
Endeavor Air Inc.	0	0.0	0.0	0.0

Table 4: The change

carrier	change in number	change in percent	lwr of CI	upr of CI
American Airlines Inc.	-1145	0.6	0.5	0.8
JetBlue Airways	-1126	1.4	1.1	1.6
Delta Air Lines Inc.	1515	2.2	2.0	2.4
ExpressJet Airlines Inc.	-5576	-0.4	-0.6	-0.2
AirTran Airways Corporation	-1594	-0.5	-0.6	-0.5
Envoy Air	-3643	-0.6	-0.7	-0.4
United Air Lines Inc.	-2613	0.9	0.7	1.1
US Airways Inc.	-482	0.5	0.4	0.6
Virgin America	562	0.4	0.3	0.5
Southwest Airlines Co.	1759	1.1	1.0	1.2
Endeavor Air Inc.	-15232	-5.4	-5.5	-5.3

The lines showed the largest increase:

```
## # A tibble: 1 x 1
## # Groups:   carrier [1]
##   carrier
##   <chr>
## 1 Southwest Airlines Co.
```

The lines showed the largest decrease:

```
## # A tibble: 1 x 1
## # Groups:   carrier [1]
##   carrier
##   <chr>
## 1 Endeavor Air Inc.
```

Reason: The total number of flights in the first 10 months of 2014 is less than that of 2013.

c.

Table 5: The percent of flights each airline is responsible for among of the three NYC airports.

carrier	airport	percent	lwr of CI	upr of CI
Endeavor Air Inc.	JFK	7.6	7.5	7.7
Endeavor Air Inc.	EWR	0.6	0.6	0.6
Endeavor Air Inc.	LGA	1.3	1.3	1.4
American Airlines Inc.	JFK	13.3	13.2	13.5
American Airlines Inc.	LGA	14.4	14.2	14.5
American Airlines Inc.	EWR	2.9	2.9	3.0
JetBlue Airways	JFK	39.6	39.4	39.8
JetBlue Airways	EWR	5.8	5.7	5.9

carrier	airport	percent	lwr of CI	upr of CI
JetBlue Airways	LGA	5.7	5.6	5.8
Delta Air Lines Inc.	LGA	22.1	21.9	22.3
Delta Air Lines Inc.	JFK	20.5	20.3	20.7
Delta Air Lines Inc.	EWR	4.1	4.0	4.2
ExpressJet Airlines Inc.	LGA	10.2	10.0	10.3
ExpressJet Airlines Inc.	EWR	34.7	34.5	34.9
ExpressJet Airlines Inc.	JFK	1.3	1.2	1.3
AirTran Airways Corporation	LGA	2.4	2.3	2.5
Envoy Air	LGA	15.8	15.6	16.0
Envoy Air	EWR	1.2	1.1	1.2
Envoy Air	JFK	6.6	6.4	6.7
United Air Lines Inc.	EWR	39.5	39.3	39.7
United Air Lines Inc.	LGA	7.5	7.4	7.7
United Air Lines Inc.	JFK	4.4	4.3	4.5
US Airways Inc.	EWR	3.8	3.7	3.9
US Airways Inc.	JFK	2.9	2.9	3.0
US Airways Inc.	LGA	12.6	12.4	12.7
Virgin America	JFK	3.5	3.4	3.6
Virgin America	EWR	1.5	1.5	1.6
Virgin America	LGA	0.0	0.0	0.0
Southwest Airlines Co.	LGA	7.0	6.9	7.1
Southwest Airlines Co.	EWR	5.3	5.2	5.4

The largest carrier at airport JFK:

```
## # A tibble: 1 x 1
##   carrier
##   <chr>
## 1 JetBlue Airways
```

The largest carrier at airport EWR:

```
## # A tibble: 1 x 1
##   carrier
##   <chr>
## 1 United Air Lines Inc.
```

The largest carrier at airport LGA.

```
## # A tibble: 1 x 1
##   carrier
##   <chr>
## 1 Delta Air Lines Inc.
```

Question 3

a.

Table 6: Percent of homes which have stucco construction as the major outside wall material

Division	Percent	Standard errors
1	1.2	0.8
2	2.1	0.7
3	0.7	0.3
4	4.9	2.0
5	10.6	1.4
6	0.4	0.4
7	3.0	0.7
8	16.6	3.2
9	64.2	4.5
10	44.6	1.7

The division which has the largest proportion:

```
## # A tibble: 1 x 1
## # Groups:   DIVISION [1]
##   DIVISION
##      <int>
## 1        9
```

The division which has the lowest proportion:

```
## # A tibble: 1 x 1
## # Groups:   DIVISION [1]
##   DIVISION
##      <int>
## 1        6
```

b.

Table 7: Average total electricity usage in kilowatt hours in each division

Division	Average	Standard errors
1	7514.6	532.0
2	8465.4	201.1
3	9128.7	203.6
4	10523.8	453.6
5	13446.6	276.9
6	14536.0	620.6
7	14324.3	423.0
8	8384.5	644.4
9	10442.0	1271.4
10	8100.4	178.6

Table 8: Average total electricity usage in kilowatt hours in each division stratified by urban and rural status

Division	Status	Average	Standard errors
1	C	5182.4	805.5
1	R	9001.1	1140.3
1	U	7626.6	549.6
2	C	10398.9	1061.0
2	R	12223.4	811.4
2	U	7788.3	214.8
3	C	9219.7	635.0
3	R	13500.0	754.3
3	U	7775.9	254.6
4	C	9936.6	545.2
4	R	14173.9	798.8
4	U	9320.2	540.3
5	C	11899.0	939.2
5	R	15942.0	563.0
5	U	12825.5	361.4
6	C	12590.8	1546.4
6	R	16332.7	1145.5
6	U	14168.2	1038.7
7	C	11889.3	466.2
7	R	16317.2	1148.0
7	U	14061.3	459.5
8	C	7782.8	670.5
8	R	9356.0	1866.3
8	U	8143.7	361.4
9	C	15905.7	606.9
9	R	8610.4	1058.3
9	U	10670.2	1305.0
10	C	11774.1	946.9
10	R	14114.8	1078.5
10	U	7049.6	314.4

c.

Table 9: The proportion of homes with internet access in urban areas

Division	Proportion	Standard errors
1	90.6	1.9
2	89.7	2.9
3	86.2	1.5
4	87.0	2.0
5	87.1	1.6
6	79.5	5.5
7	84.6	3.1
8	87.3	2.8
9	85.1	2.2
10	89.1	1.4

Table 10: The proportion of homes with internet access in rural areas

Division	Proportion	Standard errors
1	85.8	1.8
2	91.3	3.0
3	86.2	2.3
4	80.3	4.5
5	82.0	2.9
6	69.0	2.8
7	76.5	2.2
8	81.9	4.1
9	66.7	4.3
10	85.3	4.0

The division which has the largest disparity:

```
## [1] 9
```