Unit 9 Pre-Class Warm-Up

w203 Instructional Team

The file united_states_senate_2014_v2.csv contains data on the 100 members of the US senate that served in 2014. We will consider this group to be a sample (for example, from some generative process that creates senators).

```
S = read.csv("united_states_senate_2014_v2.csv")
summary(S)
```

```
##           Senator.Names    Gender          State            Party
##  Alan Franken    : 1    Female:20   Alabama   : 2   Democrat   :53
##  Amy Klobuchar   : 1    Male  :80   Alaska    : 2   Independent: 2
##  Angus King      : 1                Arizona   : 2   Republican :45
##  Barbara Boxer   : 1                Arkansas  : 2
##  Barbara Mikulski: 1                California: 2
##  Benjamin Cardin : 1                Colorado  : 2
##  (Other)         :94                (Other)   :88
##             Religion  Campaign.Money.Raised..millions.of...
##  Protestant     :49   Min.   : 0.100
##  Catholic       :27   1st Qu.: 4.575
##  Jewish         :10   Median : 7.550
##  Other Christian: 7   Mean   : 9.645
##  Mormon         : 2   3rd Qu.:13.800
##  Unaffiliated   : 2   Max.   :44.200
##  (Other)        : 3
##  Campaign.Money.Spent..millions.of...   NRA.Rating
##  Min.   : 0.200                       A      :34
##  1st Qu.: 2.975                       F      :34
##  Median : 6.000                       A+     : 9
##  Mean   : 8.227                              : 5
##  3rd Qu.:12.225                       AQ     : 5
##  Max.   :43.400                       C      : 3
##                                       (Other):10
```

You have three questions that you would like to answer with a statistical test.

Question 1: Is there a difference between the amount of money a senator raises and the amount spent?

Question 2: Do female Democratic senators raise more or less money than female Republican senators?

Question 3: Does the NRA prefer male senators or female senators?

For each question, answer the following using the dataset and your background knowledge:

1. Are the assumptions for a t-test met? (you may want to review unit 9.5)
2. Is a paired test or an unpaired test more appropriate?
3. (Unless you argue that a t-test is clearly invalid), conduct a t-test in R and interpret the results.