1. Calculate the sample mean of texts obtained from averaging all the sample data and the sample standard deviation from the data as well.

Code:

```
A = xlsread('3800fa14');
average = mean(A)
sigma = std(A)
```

Results:

```
average = 858.3137
sigma = 1.0645e+03
```

2. Does testing this claim require a one-sided or two-sided hypothesis test? Using a 93% confidence level, does the mean of the class data computed in Step 1 contradict this claim? (Show your work.)

Note:

After calculating Z and Zc, it was determined that Z was smaller. This contradicts the claim and the null hypothesis should be rejected.

I was unable to get clarity on an issue I posted about on Canvas, but if H0 is considered to be X=1300, then a two-sided hypothesis test would be used. The math would be the same, however Z would have to fall in between the interval of plus or minus Zc for the hypothesis to be accepted. In this case, it would still be rejected.

Code:

```
%one sided
%H0: X>=1300
%H1: X<1300
%n>30, use z
z = (average-1300)/(sigma/sqrt(50));
%Pr(Z>Zc)=0.93 => 1-phi(Zc)=0.93 => Q(Zc)=0.93
%Q(-Zc) = 0.07 => -Zc=1.48 = Zc=-1.48
%Z<Zc , Therefore reject H0
```

Results:

```
z = -2.9338
```

3. Survey five people at random (you may include yourself) to get their estimate of their monthly number of texts sent/received. Report the raw data and the estimated mean. Using a 93% confidence level, does the mean of your survey data contradict the university claim? (Show your work.)

Note:

The samples are assumed to be Gaussian, therefore a Q table was used to calculate Zc. Once Z and Ac were calculated, it was shown that Z was greater than Zc, therefore proving the claim. The null hypothesis should be accepted. This shows how taking fewer samples can affect the outcome of a hypothesis test.

(If H0: X=1300, the hypothesis would still be accepted due to Z falling within the interval of plus or minus Zc).

Code:

```
%one sided
%H0: X>=1300
%H1: X<1300
%n<30, use t
survey = [500;600;1000;1400;2000];
averagesurvey = mean(survey)
z2 = (averagesurvey-1300)/(sigma/sqrt(5))
%Pr(Z>Zc)=0.93 => 1-phi(Zc)=0.93 => Q(Zc)=0.93
%Q(-Zc) = 0.07 => -Zc=1.48 = Zc=-1.48
%Z>Zc , Therefore accept H0
```

Results:

```
averagesurvey = 1100

z2 = -0.4201
```