STA 210 – Homework I. B.  
I. B. Sampling

We are interested in taking a sample from the United States military. Use this information for questions 1-6.

1) Suppose we collect data from all soldiers stationed at Fort Bragg, NC. What is the issue with this sample?

2) How should we take a sample from this population in order for it to be representative of the population?

3) Suppose that we have a database that lists all military personal. We decide to pick a random starting point and to select every 400th person to be part of our sample. This is what type of sampling?

4) Suppose we have a list of all military bases. We decide to first randomly select 30 military bases and then randomly sample 500 people from each of these bases. This would be what type of sample?

5) Suppose we have a database that includes all military personnel. We use software to randomly select 10,000 soldiers. The software samples in such a way that all samples of size 10,000 have an equal probability of being selected. This would be what type of sample?

6) Suppose that the purpose of our study is to compare personnel in the Army, Navy, Air Force, and Marines. What type of sampling should be used in this scenario?

Suppose that you take a sample of 1400 adults and find that 320 work more than 40 hours per week. Use this information to answer questions 7-9.

7) What is the sample proportion?

8) What is the margin of error?

9) Construct and interpret a 95% confidence interval for the population proportion.
10) Suppose that you want to estimate a population proportion with 95% confidence and you take a sample of size 10. What is the margin of error?

11) Suppose that you want to estimate a population proportion with 95% confidence and you take a sample of size 100. What is the margin of error?

12) Suppose that you want to estimate a population proportion with 95% confidence and you take a sample of size 1000. What is the margin of error?

13) Suppose that you want to estimate a population proportion with 95% confidence and you take a sample of size 10,000. What is the margin of error?

14) In questions 10-13 what happens to the margin of error as you increase the sample size?

15) Looking at questions 12 and 13, do you think an increase in sample size from 1000 to 10,000 would typically be justified given the change in the margin of error? Explain.