In this assignment, you will demonstrate your ability to write hypotheses with the correct directionality and to correctly solve problems related to Z-scores.

In Part 1 you will be presented with several relationships and will be asked to write out the null and alternative hypotheses in the proper form. In this section you will:

1. Indicate the directionality of the relationship and what are being compared.
2. Write the null hypothesis (remember, this is in terms of the population).
3. Write the alternative hypothesis (remember, this is in terms of the samples).

In Part 2 you will be given a series of questions regarding a normal distribution, you will be asked to either determine the percentage above or below particular raw scores; or to calculate the raw score that will correspond to a particular percentage. For each question:

1. Write out your calculations.
2. Draw your normal curve- include the mean location, your score(s) location(s), and shade the area(s) you are looking for.
3. The % from the normal curve table.
4. The final answer.

**Part 1**

**You will be presented with several relationships and will be asked to write out the null and alternative hypotheses in the proper form. In this section you will:**

1. **Indicate the directionality of the relationship and what are being compared.**
2. **Write the null hypothesis (remember, this is in terms of the population).**
3. **Write the alternative hypothesis (remember, this is in terms of the samples).**
4. A medical student is designing a clinical trial to test a new depression medication. The student believes the medication will reduce the severity of patient depression.
5. A researcher is running a study examining a new pilot training software using virtual reality technology. The researcher feels pilots trained using VR training program will perform differently than traditionally trained pilots during a simulated landing task.
6. A police officer believes younger drivers get ticketed more than older drivers. A researcher at a local university has decided to test the police officer’s theory.
7. A tire company believes their new rubber compound will reduce the stopping distance of vehicles using their tires. A local engineer has decided to put their new compound to the test.
8. A researcher would like to investigate the idea that children who grow up with no siblings develop vocabulary skills at a different rate than children in large families.

**Part 2**

**A group of students take a Statistics Exam where the average was M = 85 and the standard deviation was SD = 6.8. Answer the following questions regarding this distribution using your normal curve table. Depending on the problem, be sure to identify the raw scores, Z scores, what in particular you shaded when creating a curve and the final answer.**

1. **Write out your calculations.**
2. **Draw your normal curve- include the mean location, your score(s) location(s), and shade the area(s) you are looking for.**
3. **The % from the normal curve table.**
4. **The final answer.**
5. If you score a 99, what percentage of the population scored above you?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. What raw score is needed to be in the top 8%?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. What range of raw scores makes up the middle 40%?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. If you score an 80, what percentage of the population scored above you?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. What percentage of the population lands between the raw scores of 82 and 107?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. If you score a 85, what percentage of the population scored above you?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. What raw score is needed to be in the bottom 16%?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. If you score a 96, what percentage of the population scored above you?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. What percentage of the population lands between the raw scores of 83 and 100?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**

1. If you score a 85, what percentage of the population below you?

**Calculations:**

**Normal Curve:**

**% from z-table:**

**Final Answer:**