1. Variation is the fundamental concept underlying statistics. Give three examples of where variation either affects the job you do or your everyday life.

2. Develop an operational definition for the distance between the center of the cam shaft and the center of the crank shaft from the measurement activity in lecture 2. To make things a little easier, consider making the measurement on the drawing of the assembly rather than an actual engine. The operational definition should allow anyone to make the same measurement in the same manner. It should be unambiguous and clearly lead someone through the steps of making the measurement. Using your method, report the center to center distance on the drawing in cm.

3. For each of the following examples briefly describe the enumerative and/or analytic purposes of the study. Be specific. If the study has enumerative purposes, describe the universe, frame, and sample. Additionally, explain what is being described and what inferences are being made. If the study has analytic purposes, explain what sort of predictions are being made and/or actions on the system being taken? If studies have both enumerative and analytic purposes, be sure to discuss both.

   a) A bottling company fills bottles with a popular soft drink. The bottles are labeled 473 milliliters. The fair packaging and labeling act requires that such bottles should contain at least 473 milliliters. The Federal Trade Commission does a surprise inspection at the company’s distribution center. One hundred bottles are randomly selected from the hundreds of thousands of bottles at the distribution center. The contents of each of the selected bottles is measured to see if the bottles at the distribution center meet the requirements of the fair packaging and labeling act.

   b) At the end of each fiscal year a company performs an audit of travel reimbursement forms. The audit starts by selecting a random sample of 100 travel reimbursement request forms from all the travel reimbursement request forms submitted during that fiscal year. Each of the sampled forms is checked to see if the amounts requested match receipts that are turned in with the forms. If discrepancies between amounts and receipts are found in the 100 sampled forms, all of that year’s forms and receipts are checked. If no discrepancies are found, no further checking is done.

   c) Over several years the company using the audit described in part b) above has found no discrepancies between receipts and amounts under $50. On the basis of this, the company implements the policy that receipts for items less than $50 do not have to be submitted with travel reimbursement request forms in the future.

4. There are many definitions of quality. What definitions have you come in contact with in your work, in workshops, in courses, in other training or through reading?

5. Is there a process that you are familiar with that might form the basis of a project for this course? The process, or accompanying data, can NOT be proprietary in nature.