PES University, Bangalore

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UE19CS203 – STATISTICS FOR DATA SCIENCE

Unit - 1 - Introduction to Data Science

QUESTION BANK

Types of Data and Experiments

Exercises for Section 1.1

[Text Book Exercise – Section 1.1 – Q. No. [1 – 9] – Pg. No. [12 - 13]]

1. A medical researcher wants to determine whether exercising can lower blood pressure. At a health fair, he measures the blood pressure of 100 individuals, and interviews them about their exercise habits. He divides the individuals into two categories: those whose typical level of exercise is low, and those whose level of exercise is high.
   a. Is this a controlled experiment or an observational study?
   b. The subjects in the low exercise group had considerably higher blood pressure, on the average, than subjects in the high exercise group. The researcher concludes that exercise decreases blood pressure. Is this conclusion well-justified? Explain.

2. A medical researcher wants to determine whether exercising can lower blood pressure. She recruits 100 people with high blood pressure to participate in the study. She assigns a random sample of 50 of them to pursue an exercise program that includes daily swimming and jogging. She assigns the other 50 to refrain from vigorous activity. She measures the blood pressure of each of the 100 individuals both before and after the study.
   a. Is this a controlled experiment or an observational study?
   b. On the average, the subjects in the exercise group substantially reduced their blood pressure, while the subjects in the no-exercise group did not experience a reduction. The researcher concludes that exercise decreases blood pressure. Is this conclusion better justified than the conclusion in Exercise 8? Explain.