MATHEMATICS 201-510-LW
Business Statistics
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I – Population and Samples

1. A Statistics teacher wants to determine how students evaluate Statistics once they have completed the course. A random sample of 12 students who have taken Statistics is taken, where each gives their evaluation for the course with the following scale: poor, acceptable, good, excellent.
    a) Identify the variable.
    b) Is the variable quantitative or qualitative?
    c) What is the implied population?

2. A consumer research agency wants to estimate the average cost of a computer game. A random sample 40 computer games is taken and the cost of each game recorded.
    a) Identify the variable.
    b) Is the variable quantitative or qualitative?
    c) What is the implied population?

3. A book store wants to estimate the proportion of its customers who buy science-fiction novels. A random sample of 76 customers is observed at the checkout counter and the number of customers purchasing science-fiction is recorded.
    a) Identify the variable.
    b) Is the variable quantitative or qualitative?
    c) What is the implied population?

4. A student advising file contains the following information:
    a) Name of student
    b) Year of birth
    c) High School Average
    d) Program (Social Science, Commerce, ect.)
    e) Satisfaction towards SLC (Excellent, Satisfactory, Unsatisfactory)

    For the information in parts (a) through (e) list the level of measurement (nominal, ordinal, interval or ratio).

5. Categorise these measurements according to level: nominal, ordinal, interval, or ratio.
    a) Number of assignments in a Statistics course.
    b) Program in which students in a Statistics class are registered.
    c) Attitude of Statistics students towards statistics: negative, indifferent or positive.
    d) Temperature of the room (in degrees Celsius) where Statistics is given.
    e) Length of time spent on the internet yesterday.

6. Categorise these measurements associated with a robotics company according to level: nominal, ordinal, interval, or ratio.
    a) Price of a computer game
    b) Salesperson's performance: below average, average, above average
    c) Room temperature (^{o}C) in a computer store
    d) Names of computer games
    e) Hourly wage of salesperson's
    f) The year a computer game came out

7. Identify each of the following samples by naming the sampling technique used (cluster, convenience, simple random, stratified, systematic).
    a) Average weight of newborn baby boys: Twelve hospitals are selected at random, and the weight of each baby born in January is recorded.
    b) Percentage of 18 to 25 year-olds who are in favor of legalizing marijuana: At a shopping mal, people who appear to be in the proper age group are stopped and asked for their age and whether they are in favor of legalizing marijuana.
    c) Average amount spent at a corner store: The amount of money of one in 20 customers entering a corner store is recorded.
    d) Effectiveness of a pain reliever against headaches: Patients who have a history of migraines are divided into three groups, using random numbers. The three groups are given a placebo, a half-dose, and a full-dose of the medication. The patients are asked to rate the effectiveness of the medication on a scale of 1 to 10.
    e) To judge the appeal of a proposed television sitcom, a random sample of 10 people from each of three different age categories was selected and those chosen were asked to rate a pilot show.
    f) Proportion of Canadians who think George W. Bush is the best president of the US of all time: Subscribers to the magazine "I Love George W. Bush" were asked to complete a poll on the magazine's web site.
    g) Proportion of 1st year students in Statistics: Assign a number to each student enrolled in Statistics and use a random number generator to select 20 Statistics students.
    h) To judge the interest of a new line of perfume, a random sample of 50 men and 50 women was selected and each was asked to rate the perfume.
    i) Attitude of Statistics students towards Statistics: Every fifth student on the class list is selected to fill a questionnaire.
    j) Average age of Statistics students: Twelve CEGEP Statistics classes are selected at random, and the age of each student is recorded.

8. To determine the monthly rental prices of apartment units in Quebec City, samples were constructed in the following ways. Categorize (simple random, stratified, systematic, cluster, or convenience) each sampling technique described.
    a) Number all units in the city and use a random number table to select the apartments to include in the sample.
    b) Divide the apartment units according to the number of bedrooms and then sample from each of the groups.
    c) Select 5 postal codes at random and include every apartment unit in the selected postal codes.
    d) Look in the newspaper and consider the first sample of apartments units that list rent per month.
    e) Call every 50^{th} apartment complex listed in the yellow pages and record the rent of the unit with unit number closest to 200.

ANSWERS

1. a) Evaluation of Statistics b) Qualitative
   c) All students who have completed the Statistics course
2. a) Cost of a computer game b) Quantitative c) All computer games sold
3. a) Response: purchases or not science-fiction b) Qualitative
   c) All customers of the bookstore
4. a) nominal b) interval c) ratio d) nominal e) ordinal
5. a) ratio b) nominal c) ordinal d) interval e) ratio
6. a) ratio b) ordinal c) interval d) nominal e) ratio f) interval
7. a) cluster b) convenience c) systematic d) stratified e) stratified
   f) convenience g) simple random h) stratified i) systematic j) cluster
8. a) simple random b) stratified c) cluster d) convenience e) systematic