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DSCI 1411

**Assignment 1**

1. **Answer the following questions:**
   1. A precise definition of a population of interest is important so that **you know exactly what sample group is being targeted and choose an appropriate sample size**.
   2. The most important step when conducting scientific research is **gathering evidence**. This is because the quality of the collected data will determine the quality and reliability of the conclusion (garbage in, garbage out).
   3. The advantages of taking a sample rather than a census are that samples **require less time and money** to collect the data.
   4. A **random sample** means a **good representation of the population**.
2. **Indicate which of the following variables are quantitative and which are qualitative:**
   1. Color of Cars - **Qualitative**
   2. Number of persons in a family - **Quantitative**
   3. Marital status - **Qualitative**
   4. Time needed to complete a task - **Quantitative**
   5. Number of typing errors in a document - **Quantitative**
3. **Identify the type of variable the following:**
   1. A military title - **Ordinal Categorical**
   2. Heat measured in degrees centigrade - **Continuous Quantitative**
   3. Number of goals scored by a football player during a season - **Discrete Quantitative**
   4. Field position of a football player - **Nominal**
   5. City traffic during rush hour (light, medium, heavy) - **Ordinal Categorical**
4. **Consider the following modified Monty Hall games. Monty Hall chooses the door behind which he will put the car with probabilities 0.2, 0.1, and p, respectively. That is, the door with the smallest probability to have the car is Door 2. Describe below your strategy in playing this game:**
   1. p = 1 - 0.1 - 0.2 -> **p = 0.7**
   2. The door that I would choose first is **Door 2** because it is the one with the lowest probability of having the car behind it so I can maximize the probability of finding the car when switching to the other unopened door.
   3. I **would indeed** switch to the other unopened door.
   4. The probability of winning the car under this strategy is **0.9**. This is because, first you go to the door with the least probability, which is 0.1, and then you switch to the other unopened door which will leave you with certainty that you are going to win the car (because it is the only door remaining).