American University of Armenia

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Human Perception of Randomness in Number Generation

Class Project Proposal

IESM315: Design and Analysis of Experiments

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Human Perception of Randomness in Number Generation

Humans often have difficulty generating truly random sequences of numbers. This project aims to explore the concept of randomness by examining whether people can produce random numbers under various conditions and if their background in statistics influences this ability.

Objectives

- To understand if people can generate random numbers when asked without any conditions.
- To analyze the distribution of numbers provided when conditions are imposed (e.g., within a certain range, above or below a threshold).
- To determine if a person's background in statistics affects their ability to generate random numbers.

Data Collection

A diverse group of individuals will be selected. They will be categorized based on their statistical background (e.g., No background, Basic knowledge, Expert).

Each participant will be asked to provide a sequence of numbers (e.g., 10 numbers) in a "random" fashion without any restrictions. The same participants will then be asked to provide a sequence of numbers within a certain range (e.g., between 1 and 50). Finally, participants will be prompted to generate numbers above or below a certain threshold (e.g., above 70).

Data Analysis

Randomness Test: Standard statistical tests for randomness, such as the runs test or chi-squared test, will be applied to determine if the sequences are random.

Distribution Analysis: The sequences will be analyzed to see if any hidden distribution (e.g., normal, exponential) can be discerned from the data.

Group Comparison: Differences in the ability to generate random numbers will be compared across groups based on statistics background using statistical tests (e.g., ANOVA).