Multiple Choice Question Assignment

Goal

The purpose of this exercise is to demonstrate understanding of one of the technical topics covered in the course through the development of a multiple choice question (MCQ).

Structure of a Multiple Choice Question

A multiple choice question consists of 3 elements, the *stem*, the correct *answer* and a number of *distractors*, these are briefly described below.

- **The stem** defines the question that the MCQ should answer. A good stem should be concrete, concise and unambiguous, i.e. it should address a single problem/question, it should only provide the necessary information (unless it is the purpose of the question to identify the correct information), and it should be worded positively to avoid confusion often arising from negations.
- **The answer** must be correct and not easily identifiable from the structure of the stem. Please avoid constructing trick questions, i.e. questions should be designed so that a student who knows the material can find the correct answer.
- **The distractors** must provide plausible alternatives to the correct answer. They should be homogeneous in structure and similar to the correct answer, so that they are not easily identified by grammatical means. Distractors should be mutually exclusive, so that answers are unambiguos. Good distractors prevent students who *do not* know the correct answer from guessing it correctly, but they should also prevent students who *do* know the answer from being confused.

Evaluation of the MCQ Assignemnt

Write a short report to document the design of your question. The report should cover the following four areas:

1. **Theory behind the question** (max 1 page)
   Provide a short summary of the theory behind the question. This should provide sufficient information to understand the question (the stem), the correct answer, and the distractors.
2. **Examination goal for the question** (max 1/2 page)
   This section should describe what aspect of the theory that the question is supposed to evaluate, i.e. which cognitive domain according to Bloom's Taxonomy the question is designed to test. The cognitive domains can be summarized by:
   - Knowledge: remember facts or basic concepts/terminology
   - Comprehension: explain ideas or concepts
   - Application: use concepts to solve problems
   - Analysis: break down problem to show relationships
   - Synthesis: build a structure or pattern from diverse elements
   - Evaluation: justify opinion or statement

   A full exam set should test all cognitive domains, so all types of questions will be accepted, but questions that test the higher cognitive domains are generally more difficult and time consuming to design, so this will be rewarded when this assignment is marked.
3. **Design of stem** (max 1/2 page)
   This section should explain the intention behind the question, i.e. explain how the question achieves the examination goal. It should also define the correct answer.
4. **Design of distractors** (max 1/2 page per distractor)
   This section should describe each of the distractors. We generally follow a schema with 4 choices for each question, so there should be one answer and three distracttors for each question, but we accept answers with fewer or more distractors, i.e. there should only be one correct answer, but there could be 2 or 5 distractors.

The design of the distractors should explain what each of them are designed to test. Please relate the distractors to the course theory and the learning objectives of the course, so do not include distractors that simply test the ability to calculate a correct answer.

In order to provide a further incentive to design a good multiple choice question, we promise to include contributed questions as 10% of the exam set. We may rephrase the question slightly or change any numbers used, but students who design a good question should be able to recognize their own question if it is used in the final exam.

Useful Links

There are numerous good references online, which explain how to design qood multiple choice questions; a few of these are included below.

- Writing Good Multiple Choice Test Questions
- Designing Good Multiple Choice Questions

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