

If Statements

Question 1: even_or_odd(input: int)

Explanation of question creation and value:

The first if statement question focuses on introducing students to the idea of conditional statements. As the function name suggests, the goal of this problem is to output whether the input number is even or odd. The key idea behind this problem is to begin with a concept that many students are familiar with, such as even and odd numbers, and further develop their skills to think in a computational manner. This encourages students to think through the problem and further engage with the course material. Furthermore, the solution to this problem requires two conditional statements, along with the mod operator, which enforces the basics of if statements and computational thinking.

Question 2: percent_to_letter_grade(percent: float)

Explanation of question creation and value:

The second question aims to build upon the first question and reinforce student understanding about conditional statements. The goal of this problem is to simulate a grade converter that takes a percentage grade and converts it to a letter grade. The scale given is that percentages 80 and up are grade A, 70-80 is a B, 60-70 is a C, 50-60 is a D, and anything below is a F. This question promotes students to delve further into conditional statements and think about situations that have multiple outcomes. Moreover, Hogan et al. (2024) found that incarcerated students are more engaged with computer science exercises when the material is related to areas of interest or enjoyment. The percentage converter problem incorporates existing research by relating to the topic of education, thus having a greater interest by the students taking the course.

Question 3 (challenge question): medical_code(n: int)

Explanation of question creation and value:

The third question is slightly more advanced and combines the concepts from the first two questions. The objective of this problem is to decode the medical code input and correctly output the patient status. The problem description is as follows: To ensure confidentiality, a doctor has assigned unique medical codes to each of their patients. Medical codes that are divisible by 3 and 5 output 'Fully recovered', codes divisible only by 3 output 'Recovery in progress', codes divisible only by 5 output 'Appointment scheduled', and otherwise outputs 'No

appointment'. Furthermore, this question is designed to build on Hogan et al.'s (2024) findings regarding incarcerated individuals preferring themes with real-world scenarios. Fundamentally, the question is identical to the FizzBuzz problem, but rephrased such that it correlates to a real life scenario. Restructuring a technical question to have meaning promotes students to engage with the material more thoughtfully and approach problems critically.
