Class and Database Representation

Implementation of database:

1. Questions table:
    - Id (int)
    - QuestionText (varchar)
2. Choices table:
    - Id (int)
    - ChoiceText (varchar)
    - IsTrue (bit)
    - QuestionId (int)
3. UserProgress table:
    - Id (int)
    - Score (int)

Relantionship between tables Questions and Choices is one to many, the table UserProgress is independent of Questions and Choices.

Class diagram:

1. Question class:
    - Properties:
        1. Id: Guid
        2. QuestionText: string
    - Methods:
        1. GenerateRandomQuestion()

2. Choice class:

- Properties:
    1. Id: Guid
    2. ChoiceText: string
    3. IsTrue: bool
    4. QuestionId: int
- Methods:
    1. CheckAnswer()

3. UserProgress class:

- Properties:
    1. Id: Guid
    2. Score: int
- Methods:
    1. StartQuiz()
    2. GetNextQuestion()
    2. FinishQuiz()
    3. StartAgainQuiz()
    4. SaveScore()

The Question class has a one-to-many relationship with the Choice class, as a question can have multiple choices. The Id property of Question is used as a foreign key (QuestionId) in the Choice class.

The flow of data starts with the StartQuiz() method triggering the GenerateRandomQuestion() method from the Question class, which generates a question with associated choices.

The user interacts with the choices afterwards GetNextQuestion() is triggered. The CheckAnswer() method from the Choice class determines if the answer is correct. If the answer is correct the progress is saved by SaveScore() .

The FinishQuiz() method also saves the score and can be followed by StartAgainQuiz().