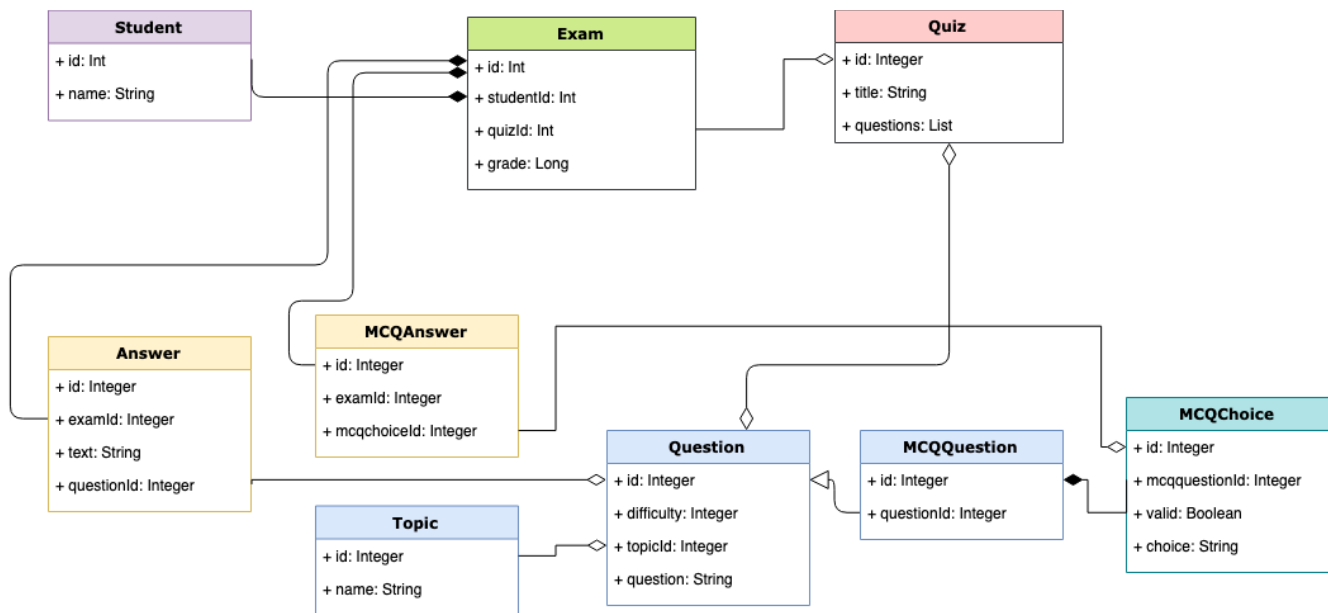# Technical Specification Document

Java Quiz Manager (JQM) is a console interface application built in the Java programming language with the purpose of creating and taking quizzes. The Java Quiz Manager uses the H2 relational database management system. A web browser is used to interface with the database, and H2 uses a subset of the SQL standard.

When a user enters the Java Quiz Manager from their command line, the user chooses the role of being either a student or a quiz manager. As a student, the user takes an exam which is a quiz with a grade at the end. As a quiz manager, the user can create, update or delete quizzes which are composed of questions.

JQM has data models including Student, Exam, Quiz, MCQQuestion (MCQ = Multiple Choice Question), MCQChoice, Question, MCQAnswer, and Answer. We can see the relationships of each of them below in the schema design.

Schema Design:

As seen in the above the schema, an Exam "has-a" composition relationship with Student, Answer, and MCQAnswer models. If an Exam is deleted, its corresponding Student, Answers and MCQAnswers will be deleted as well. As a future goal, we can have Students with an aggregation relationship with Exams, so that the same student could take multiple exams and have an average of their different grades.

When a Student takes an Exam, they are prompted with the Questions belonging to the Quiz. Their answers are stored as either MCQAnswers if the question was a multiple choice question, or an Answer if the question was open ended.

Quizzes have many questions, and a Question can belong to multiple quizzes. MCQQuestion is inherited from the Question class, because a MCQQuestion is a type of Question. MCQQuestions have multiple MCQChoices which have strong aggregation, because if a MCQQuestion ceases to exist so does its MCQChoices. Question have a weak aggregation with Topics, because even if a Question is deleted other Questions may use the same topic. A future plan is to allow Questions to have multiple Topics.

The Java Quiz Manager is a simple and easy way to create, manage, and take quizzes from the command line even without an internet connection.