**JAVA PROGRAMMING PROJECT 1**

**Implement the Question Class**:

public class Question {

private String questionText;

private String[] options;

private String correctAnswer;

public Question(String questionText, String[] options, String correctAnswer) {

this.questionText = questionText;

this.options = options;

this.correctAnswer = correctAnswer;

}

public String getQuestionText() {

return questionText;

}

public String[] getOptions() {

return options;

}

public String getCorrectAnswer() {

return correctAnswer;

}

}

**Implement the Quiz Class**:

import java.util.ArrayList;

import java.util.List;

public class Quiz {

private List<Question> questions;

public Quiz() {

this.questions = new ArrayList<>();

}

public void addQuestion(Question question) {

questions.add(question);

}

public List<Question> getQuestions() {

return questions;

}

}

**User Interaction and Input Handling**

1. **Implement User Interaction**:
   * Use Scanner class for capturing user input.
   * Display questions to the user and capture their responses.
2. **Input Validation**:
   * Ensure that user inputs are valid (e.g., checking if the chosen option exists).

import java.util.Scanner;

public class QuizApp {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

Quiz quiz = new Quiz();

// Add sample questions

quiz.addQuestion(new Question("What is the capital of France?", new String[]{"A. Paris", "B. London", "C. Berlin"}, "A"));

quiz.addQuestion(new Question("What is 2 + 2?", new String[]{"A. 3", "B. 4", "C. 5"}, "B"));

int score = 0;

for (Question question : quiz.getQuestions()) {

System.out.println(question.getQuestionText());

for (String option : question.getOptions()) {

System.out.println(option);

}

System.out.print("Enter your answer: ");

String userAnswer = scanner.nextLine().toUpperCase();

if (userAnswer.equals(question.getCorrectAnswer())) {

score++;

}

}

System.out.println("Your score: " + score + "/" + quiz.getQuestions().size());

}

}

**Scoring and Feedback**

1. **Calculate and Display Score**:
   * Implement scoring logic in the QuizApp class.
   * Provide feedback to the user based on their performance.

**Day 6: Input Validation and Testing**

1. **Enhance Input Validation**:
   * Handle invalid inputs gracefully (e.g., non-existent options).
   * Allow the user to retry in case of invalid input.
2. **Testing**:
   * Test the application with different sets of questions.
   * Fix any bugs or issues.

**Final Testing and Refinement**

1. **Polish the User Interface**:
   * Improve the console output for better readability.
   * Add any final touches to the code.
2. **Final Testing**:
   * Conduct thorough testing to ensure the application works as expected.
   * Prepare documentation or comments for the code.

**Final Code Example**

**import java.util.ArrayList;**

**import java.util.List;**

**import java.util.Scanner;**

**class Question {**

**private String questionText;**

**private String[] options;**

**private String correctAnswer;**

**public Question(String questionText, String[] options, String correctAnswer) {**

**this.questionText = questionText;**

**this.options = options;**

**this.correctAnswer = correctAnswer;**

**}**

**public String getQuestionText() {**

**return questionText;**

**}**

**public String[] getOptions() {**

**return options;**

**}**

**public String getCorrectAnswer() {**

**return correctAnswer;**

**}**

**}**

**class Quiz {**

**private List<Question> questions;**

**public Quiz() {**

**this.questions = new ArrayList<>();**

**}**

**public void addQuestion(Question question) {**

**questions.add(question);**

**}**

**public List<Question> getQuestions() {**

**return questions;**

**}**

**}**

**public class QuizApp {**

**public static void main(String[] args) {**

**Scanner scanner = new Scanner(System.in);**

**Quiz quiz = new Quiz();**

**// Add sample questions**

**quiz.addQuestion(new Question("What is the capital of France?", new String[]{"A. Paris", "B. London", "C. Berlin"}, "A"));**

**quiz.addQuestion(new Question("What is 2 + 2?", new String[]{"A. 3", "B. 4", "C. 5"}, "B"));**

**int score = 0;**

**for (Question question : quiz.getQuestions()) {**

**System.out.println(question.getQuestionText());**

**for (String option : question.getOptions()) {**

**System.out.println(option);**

**}**

**System.out.print("Enter your answer: ");**

**String userAnswer = scanner.nextLine().toUpperCase();**

**while (!userAnswer.matches("[A-C]")) {**

**System.out.print("Invalid answer. Enter a valid option (A, B, or C): ");**

**userAnswer = scanner.nextLine().toUpperCase();**

**}**

**if (userAnswer.equals(question.getCorrectAnswer())) {**

**score++;**

**}**

**}**

**System.out.println("Your score: " + score + "/" + quiz.getQuestions().size());**

**}**

**}**

**Here's the sample output for the given QuizApp project, assuming the user interacts with the console-based application as described:**