# CSIS 2175

**Due date: Mar 21, 2022 (05:00PM)**

## Submission

You need to submit all .java files in a single .zip file by the due date. **NO LATE SUBMISSION** will be allowed.

You may submit your work multiple times, but only the last submission will be graded.

## Description

In this assignment, you are required to implement an electronic programming quiz system. User can create questions and preview the quiz.

## Your Task

You are asked to write a Java program for the programming quiz system. There are two types of questions: Multiple Choice Question and Ture/False Question. User can create questions using the system; and preview the quiz, which display all questions in the system one by one. During the preview, the user can attempt the quiz by entering his/her answers to questions. The system will then immediately check the answer and calculate. After attempting all questions, the total score will be displayed. A sample run of the program is shown as below (Green text refers to user input):

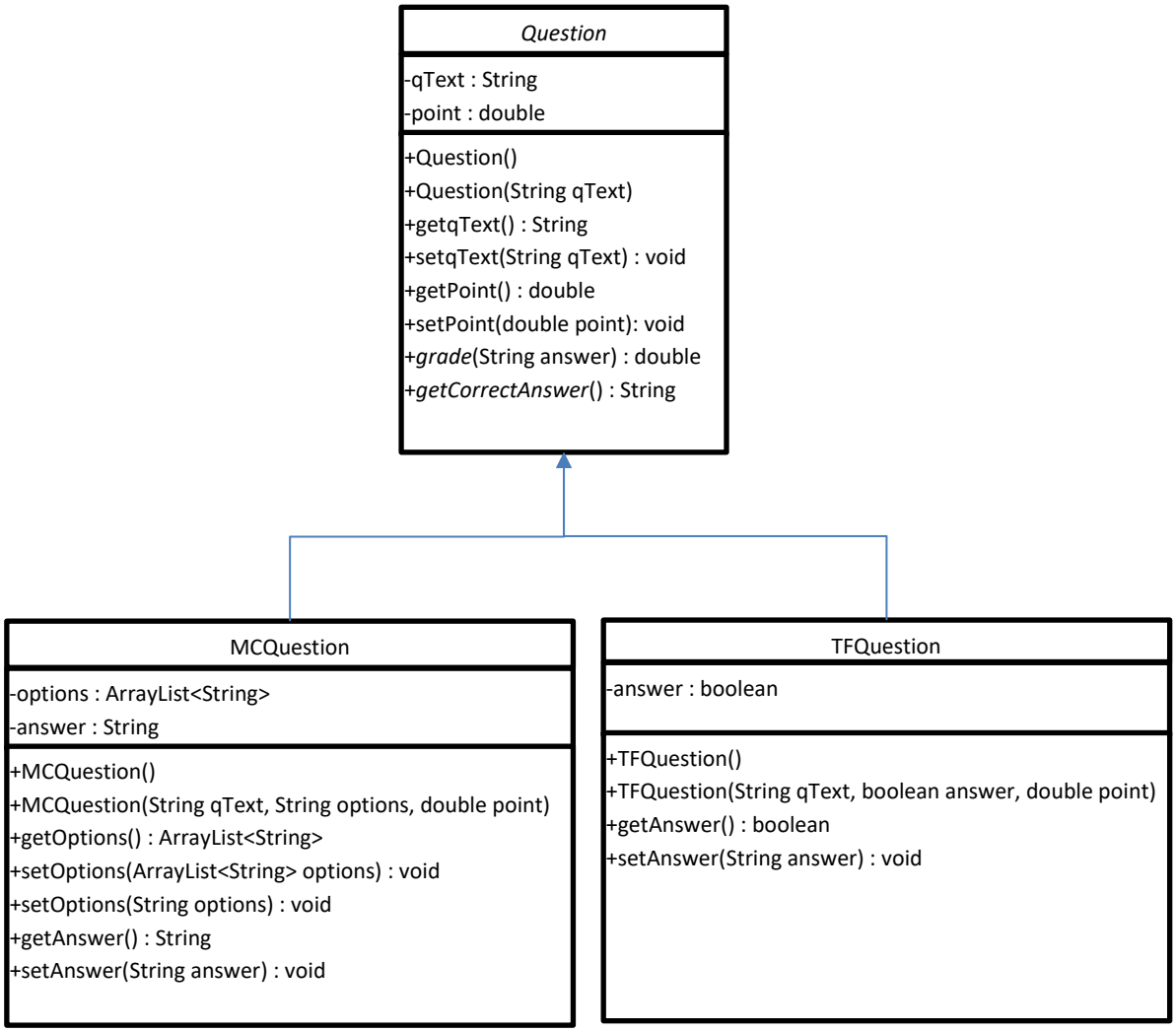
```
Please choose (c)reate a question, (p)review or (e)xit >> c
Enter the type of question (MC or TF) >> MC
Enter the question text >> Each primitive type in Java has a corresponding
class contained in the java.lang package. These classes are called ____
classes.
How many options? 4
Enter Option A (Start with * for correct answer) >> case
Enter Option B (Start with * for correct answer) >> primitive
Enter Option C (Start with * for correct answer) >> *type-wrapper
Enter Option D (Start with * for correct answer) >> show
How many points? 3
Please choose (c)reate a question, (p)review or (e)xit >> c
Enter the type of question (MC or TF) >> MC
Enter the question text >> A(n) ____ variable is known only within the
boundaries of the method.
How many options? 5
Enter Option A (Start with * for correct answer) >> method
Enter Option B (Start with * for correct answer) >> *local
Enter Option C (Start with * for correct answer) >> double
Enter Option D (Start with * for correct answer) >> instance
Enter Option E (Start with * for correct answer) >> global
How many points? 2
Please choose (c)reate a question, (p)review or (e)xit >> c
Enter the type of question (MC or TF) >> TF
```

```
Enter the question text >> Java is a free-form programming language.
Answer is True or False? True
How many points? 1
Please choose (c)reate a question, (p)review or (e)xit >> p
Each primitive type in Java has a corresponding class contained in the
java.lang package. These classes are called ____ classes. (3.0 Points)
A: case
B: primitive
C: type-wrapper
D: show
Enter your choice >> A
You are wrong. The correct answer is C.
A(n) ____ variable is known only within the boundaries of the method. (2.0
Points)
A: method
B: local
C: double
D: instance
E: global
Enter your choice >> B
You are correct!
Java is a free-form programming language. (1.0 Points)
True(T) or False(F) >> F
You are wrong. The correct answer is true.
The quiz ends. Your score is 2.0.
Please choose (c)reate a question, (p)review or (e)xit >> c
Enter the type of question (MC or TF) >> MC
Enter the question text >> A(n) ____ constructor is one that requires no
arguments.
How many options? 3
Enter Option A (Start with * for correct answer) >> class
Enter Option B (Start with * for correct answer) >> *default
Enter Option C (Start with * for correct answer) >> explicit
How many points? 2
Please choose (c)reate a question, (p)review or (e)xit >> c
Enter the type of question (MC or TF) >> TF
Enter the question text >> Javascript and Java are the same.
Answer is True or False? False
How many points? 0.5
Please choose (c)reate a question, (p)review or (e)xit >> p
Each primitive type in Java has a corresponding class contained in the
java.lang package. These classes are called ____ classes. (3.0 Points)
A: case
B: primitive
C: type-wrapper
D: show
```

```
Enter your choice >> C
You are correct!
A(n) ____ variable is known only within the boundaries of the method. (2.0
Points)
A: method
B: local
C: double
D: instance
E: global
Enter your choice >> B
You are correct!
Java is a free-form programming language. (1.0 Points)
True(T) or False(F) >> T
You are correct!
A(n) ____ constructor is one that requires no arguments. (2.0 Points)
A: class
B: default
C: explicit
Enter your choice >> C
You are wrong. The correct answer is B.
Javascript and Java are the same. (0.5 Points)
True(T) or False(F) >> T
You are wrong. The correct answer is false.
The quiz ends. Your score is 6.0.
Please choose (c)reate a question, (p)review or (e)xit >> e
Goodbye!
```

**Requirement:**

1. The output of the program **MUST EXACTLY** the same as the above sample run of in character level.
2. You must create classes according to the following class diagram (Note: *italic* font refers to abstract methods/classes, while normal font refers to concrete methods/classes):




**Question Class:**

- This class represents the generic form of question. It contains the question text (**`qText`**) and the point of a question (**`point`**).
- The **`grade`** method, which is an abstract method, has a parameter, answer (**`String`**). It returns the points of the question if the answer is correct; zero otherwise.
- The **`getCorrectAnswer`** method, which is an abstract method, has no parameter. It returns a **`String`** representing the correct answer to the question.

**MCQuestion Class**

- It is a subclass of **`Question`**.
- It represents a multiple-choice question. A multiple-choice question may have **3-5** options.
- Each element of the instance variable **`options`** refers to an option in this question.
- The instance variable **`answer`** is a **single-character** string. It saves the correct answer ("A", "B", "C", "D" or "E") to this question.

- The method **setOptions(String options)** has the **answer** field from the database (explained below) as the parameter. It will add all options to the instance variable **options** and set the instance variable **answer**.
- The constructor **MCQuestion(String qText, String options, double point)** creates an **MCQuestion** object by setting the **qText**, adding option to **options** , setting the correctAnswer to **answer** and **point** by reading the **QText**, **Answer**, and **Point** fields from the database.
- The **grade** method returns the points of the question if the parameter, which can be "**A**", "**B**", "**C**", …, is equal to the instance variable **answer**, zero otherwise.
- The **getCorrectAnswer** method returns the letter (i.e. "**A**", "**B**", "**C**", …) representing the correct answer.

**TFQuestion Class**

- It is a subclass of **Question**.
- It presents a True/False question.
- The instance variable **answer** is a **boolean** variable representing the correct answer of the question (i.e., **True** or **False**).
- The constructor **TFQuestion(String qText, boolean answer, double point)** creates an **TFQuestion** object by setting the **qText**, **answer**, and **point** by reading the **qText**, **Answer**, and **Point** fields from the database.
- The **grade** method returns the points of the question if the parameter, which can be "**T**" or "**F**", is equal to the instance variable **answer**, zero otherwise.
- The **getCorrectAnswer** method returns the letter "**T**" or "**F**" representing the correct answer.

3. You must read/write from/to the database provided in this question (Question.accdb). This MS Access file contains a table called Questions. It contains the following fields:
    a. **ID** (Automatically generated integer by MCAccess)
    b. **QText** (Short Text): The question text
    c. **Answer** (Short Text):
        i. If this is a multiple-choice question, Answer stores all options separated by "##". There is a leading "*" for the correct option.
        ii. If this is a True/False question, Answer stores the string "Ture" or "False".
    d. **Point** (Single): It is a float point number representing the point of this question.
    e. **Type** (Short Text): "MC" or "TF" denoting multiple-choice or True/False questions respectively.
4. Question.accdb contains no record at the beginning.
5. You must create a class **Asgn03**, which has the main method to run the program.
6. Refer to the following screenshots for the data format saved in the database.

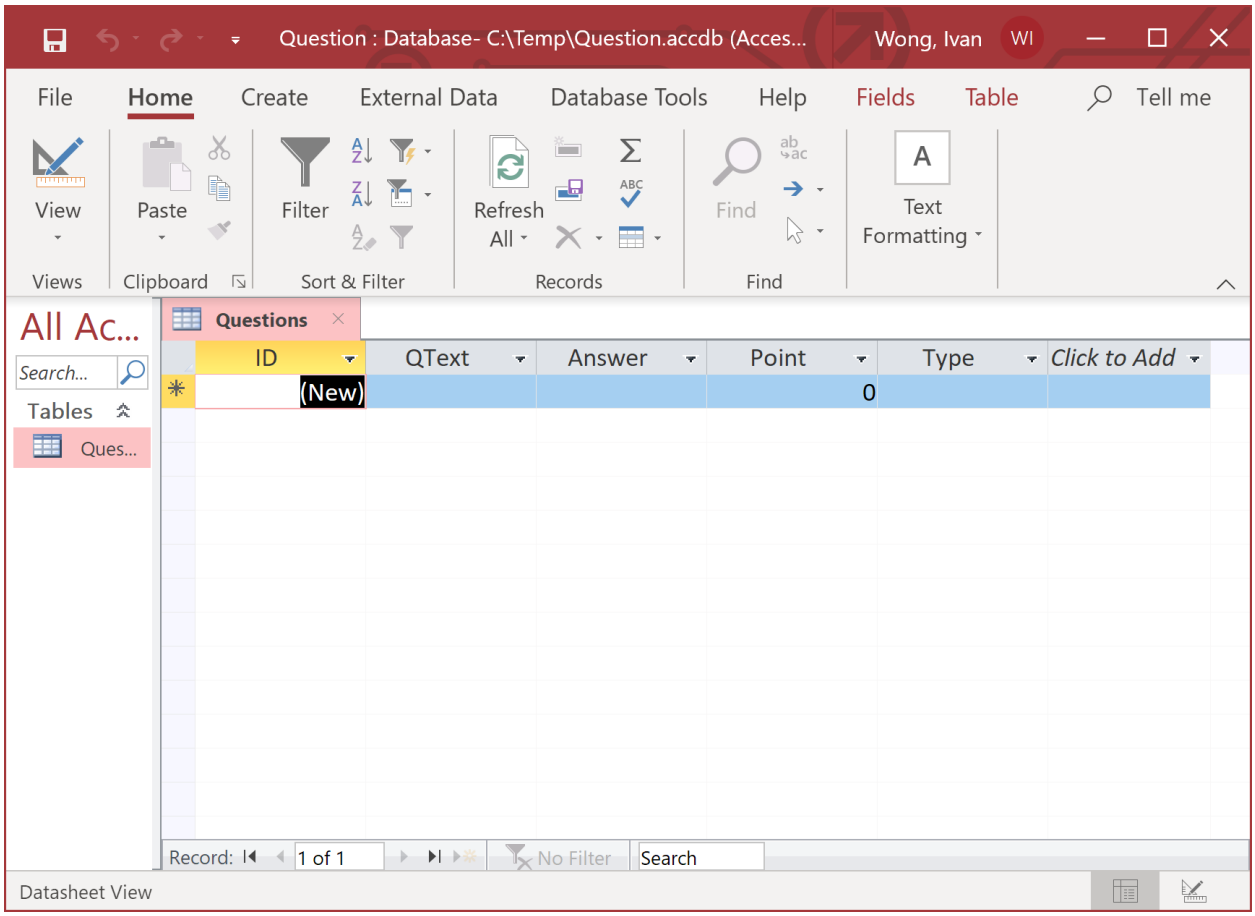



*Figure 1: No records at the beginning*

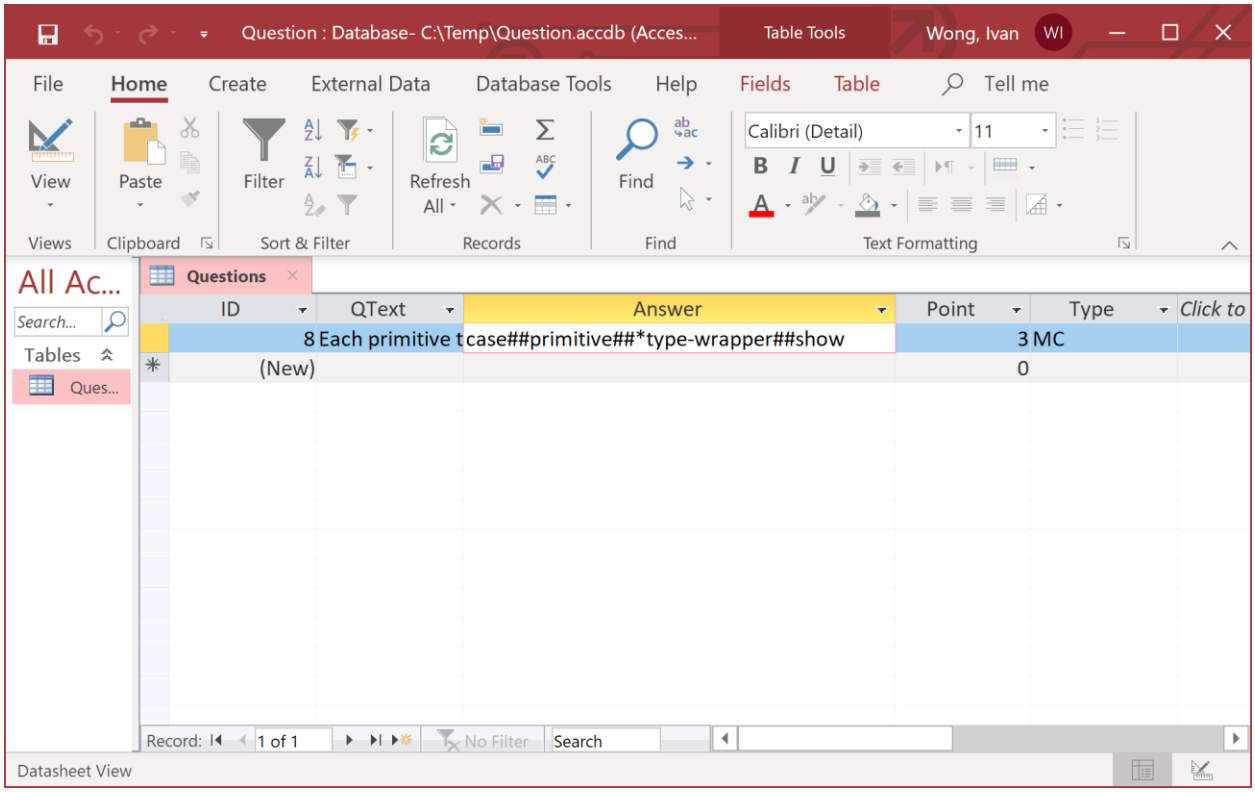



*Figure 2: After creating the first question in the sample run.*

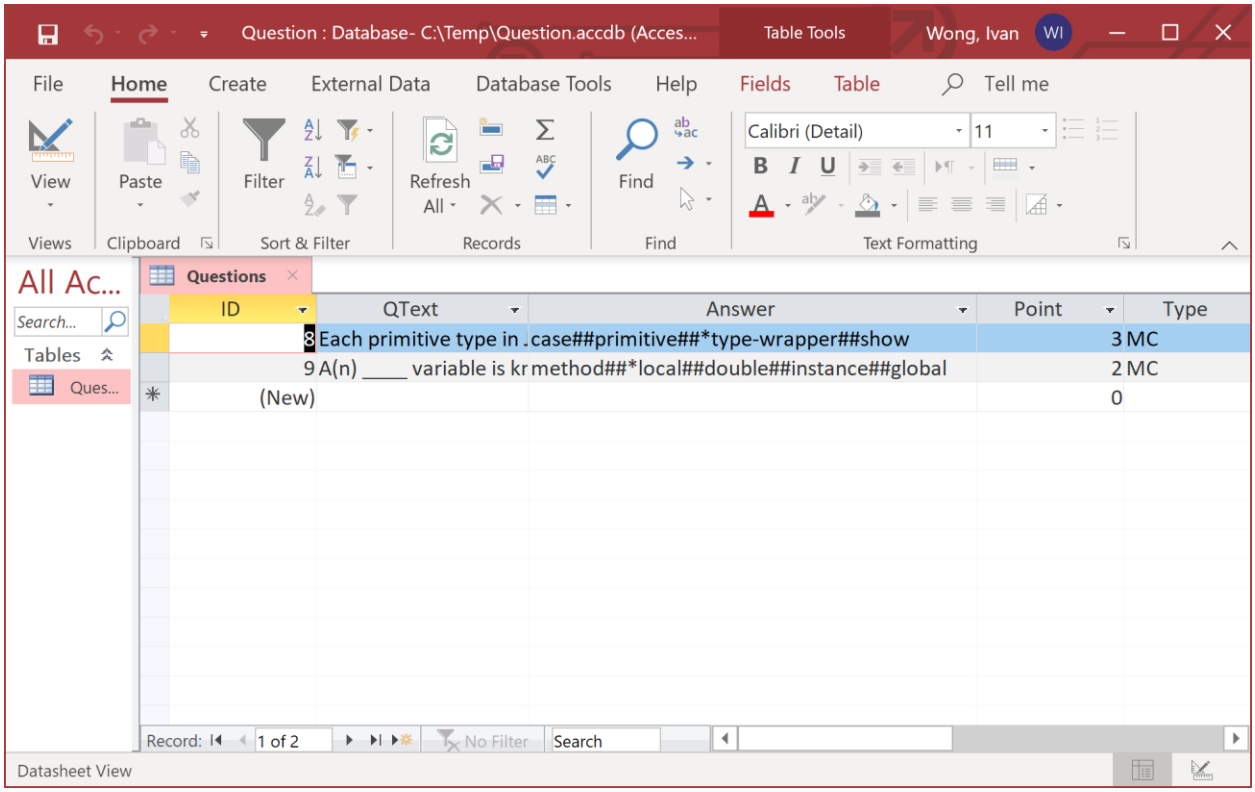



*Figure 3: After creating the second question in the sample run.*

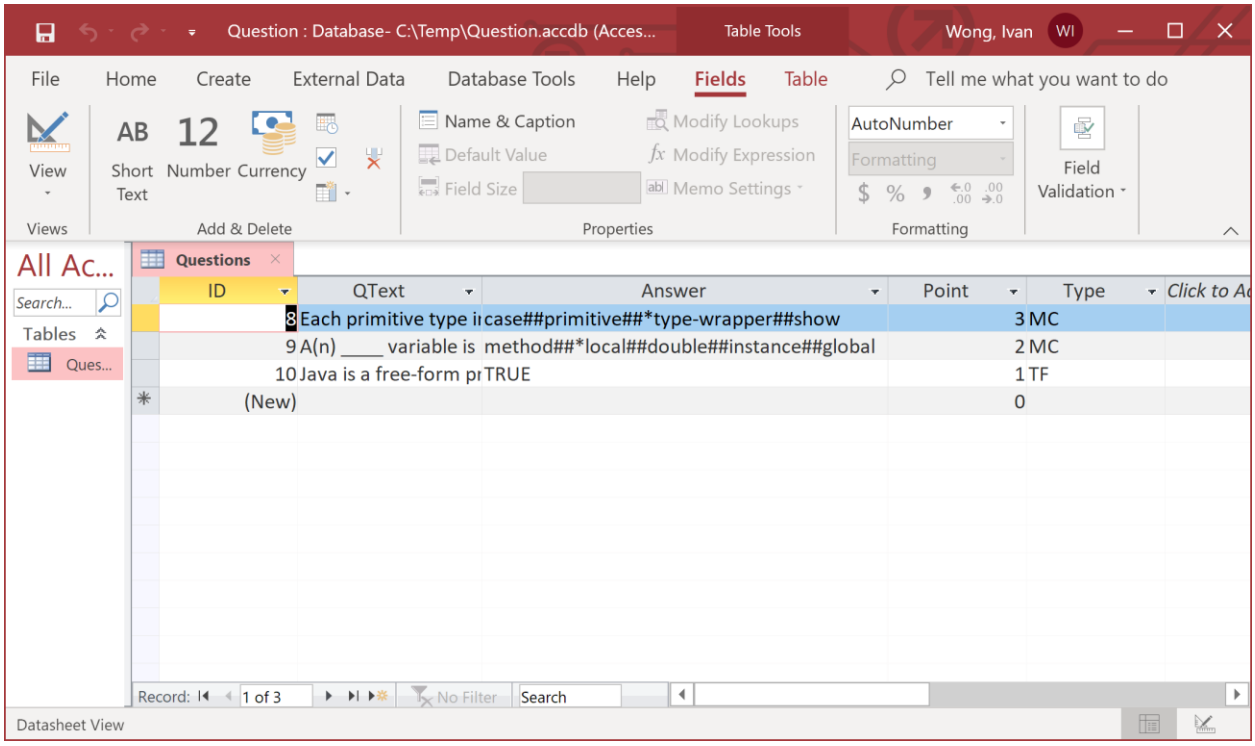



*Figure 4: After creating the third question in the sample run.*

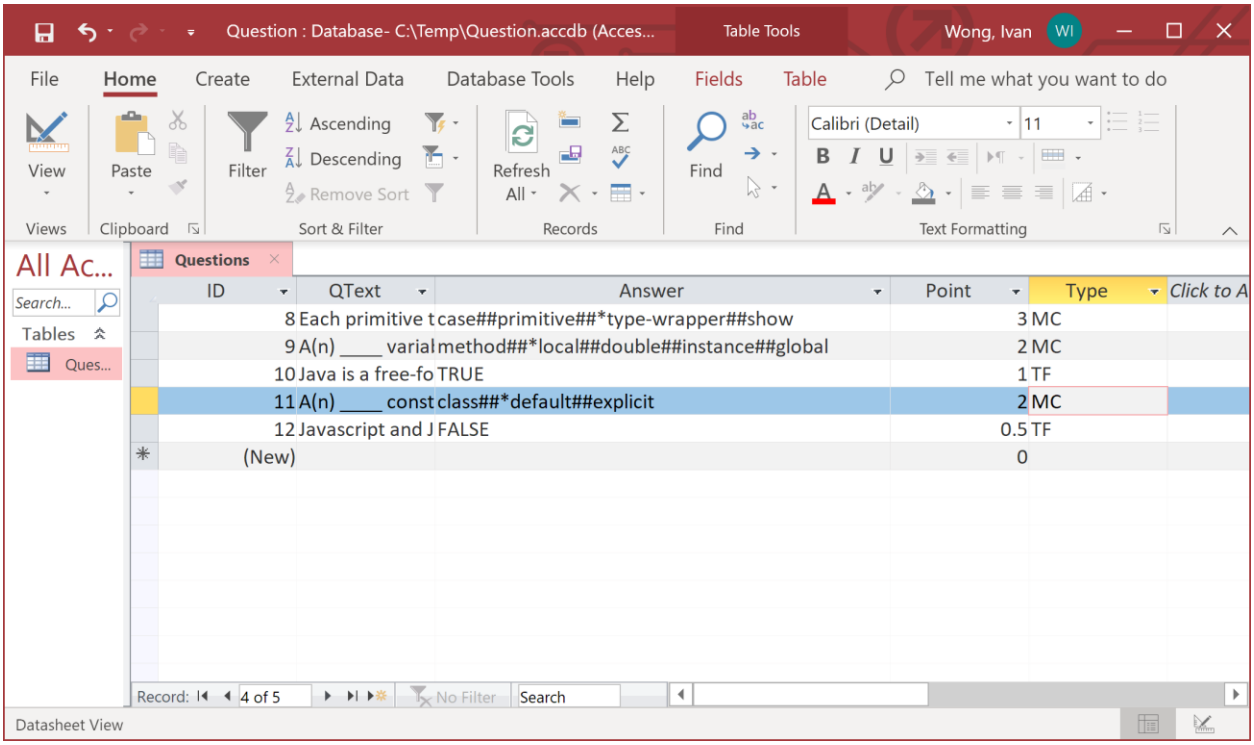



*Figure 5: After terminating the sample run*

## Grading

Correctness of the program: 90%
Programming style/comment/clarity: 10%
**Overall marks will not be more than 50% if not following the requirement.**

## Assumptions

You may assume that there will be no invalid input by the user.