CSIS 2175

Due date: Nov 25, 2022 (05:00PM)

Submission

You need to zip the Eclipse project folder for submission

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

*Tutorial for zipping a folder:
https://www.youtube.com/watch?v=Ipn-T5Um3d4 for Windows
https://www.youtube.com/watch?v=V0wkG6zOpjA for Mac

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
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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
```
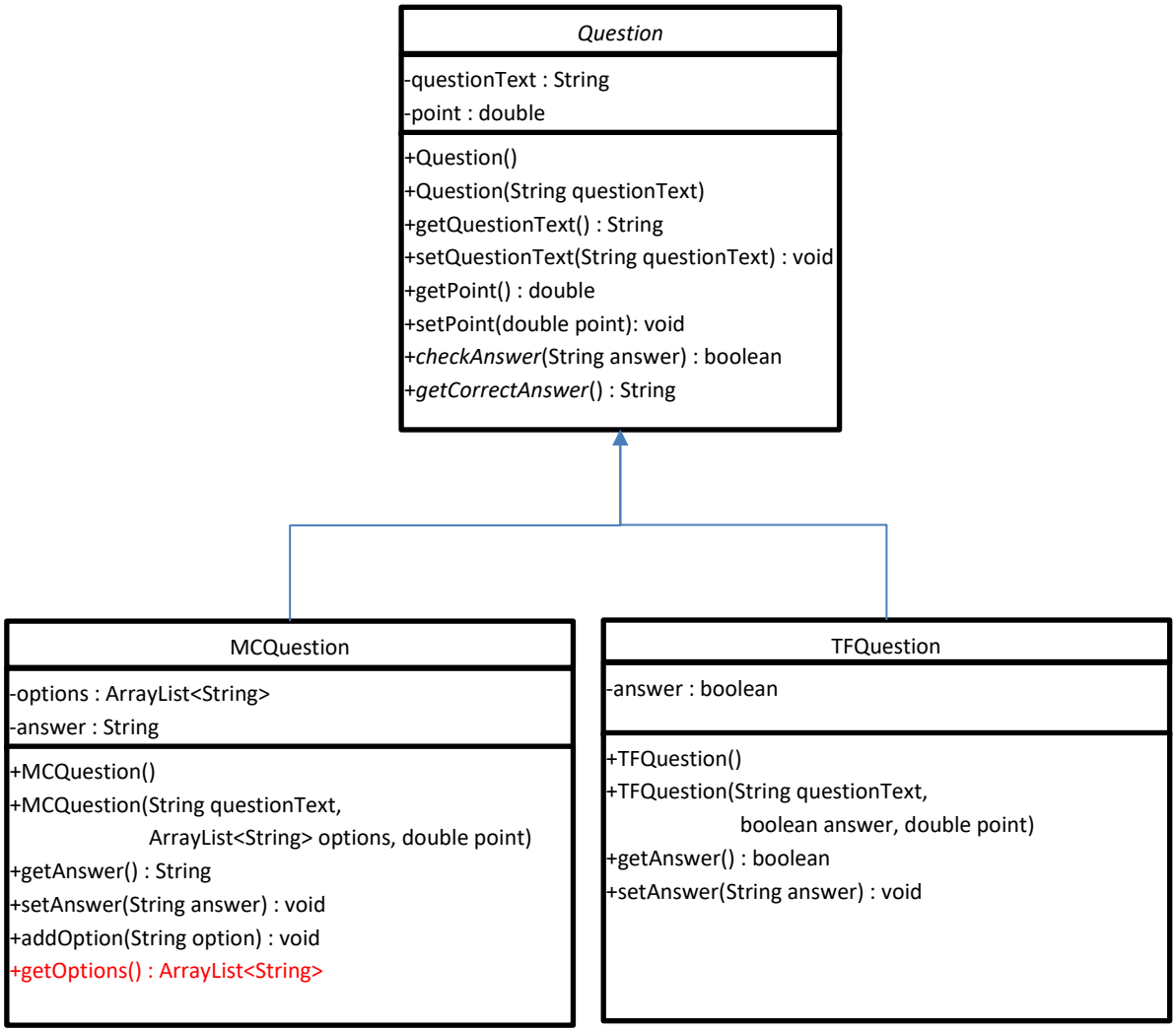

```
Each primitive type in Java has a corresponding class contained in the
java.lang package. These classes are called ____ classes. (3.0 Points)
A: case
B: primitive
C: type-wrapper
D: show
Enter your choice >> C
You are correct!
A(n) ____ variable is known only within the boundaries of the method. (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 (**`questionText`**) and the point of a question (**`point`**).
- The **`checkAnswer`** method, which is an *abstract* method, has a parameter, **`answer`** (**`String`**). It returns true if the **`answer`** is correct.
- 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 **`addOption(String option)`** will add an option to the instance variable options.

- The method **`getOptions()`** will add return the ArrayList of options.
- The constructor **`MCQuestion(String questionText, ArrayList<String> options, double point)`** creates an **`MCQuestion`** object by setting the **`questionText`**, **`options`** , **`answer`** and **`point`**.
- The **`checkAnswer`** method returns true if the parameter **`answer`**, which can be "**`A`**", "**`B`**", "**`C`**", …, is equal to the instance variable **`answer`**, false otherwise.
- The **`getCorrectAnswer`** method returns the letter (i.e. "**`A`**", "**`B`**", "**`C`**", …) representing the correct answer of this question.

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 **`checkAnswer`** method returns true if the parameter answer, which can be "**`T`**" or "**`F`**", is equal to the instance variable **`answer`**, false 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 apply polymorphism and dynamic binding in the assignment. (i.e., Those abstract method calls (**`checkAnswer`** and **`getCorrectAnswer`**) need to be done via variables of Question when previewing the quiz.)
6. You must create a class **`Asgn03`**, which has the main method to run the program.
7. Refer to the following screenshots for the data format saved in the database.

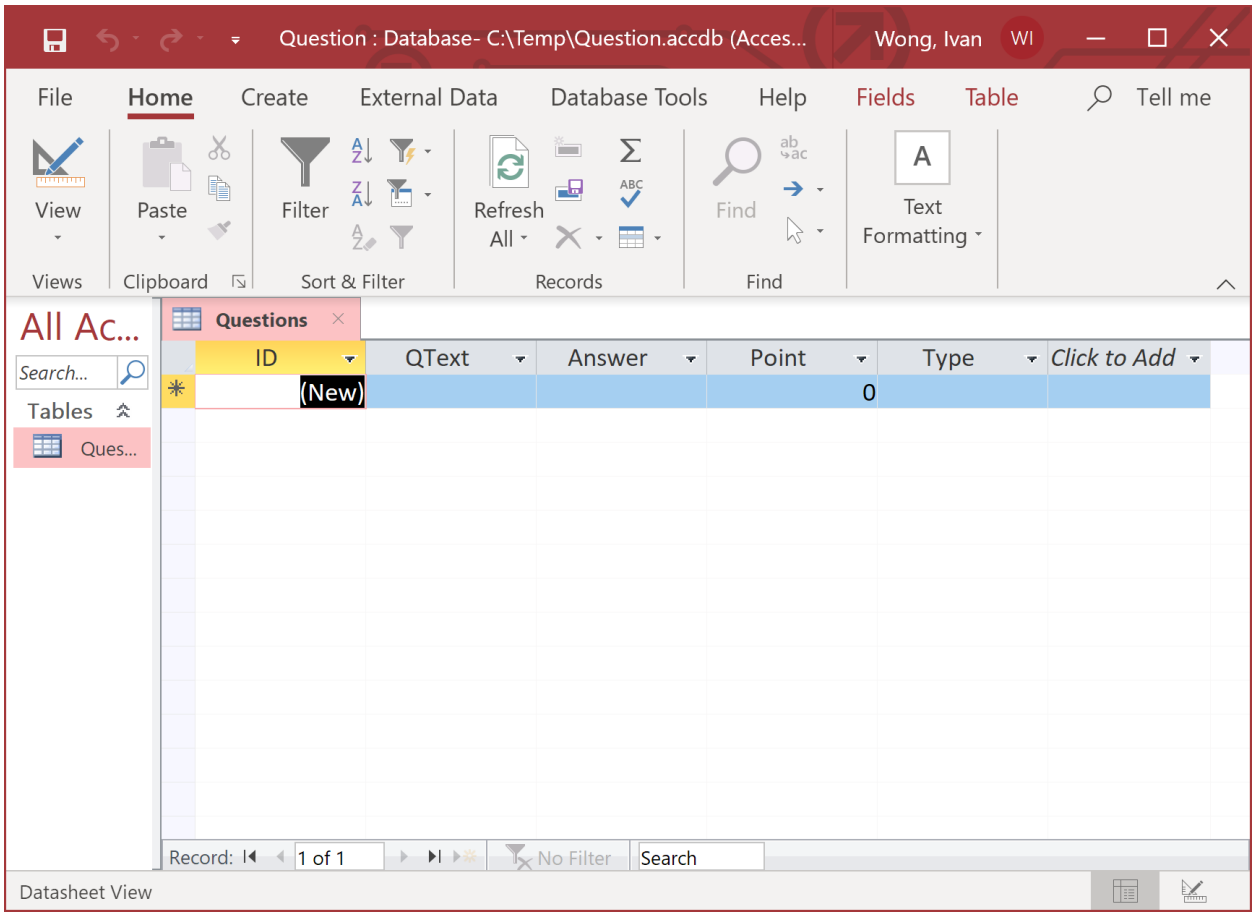


Figure 1: No records at the beginning

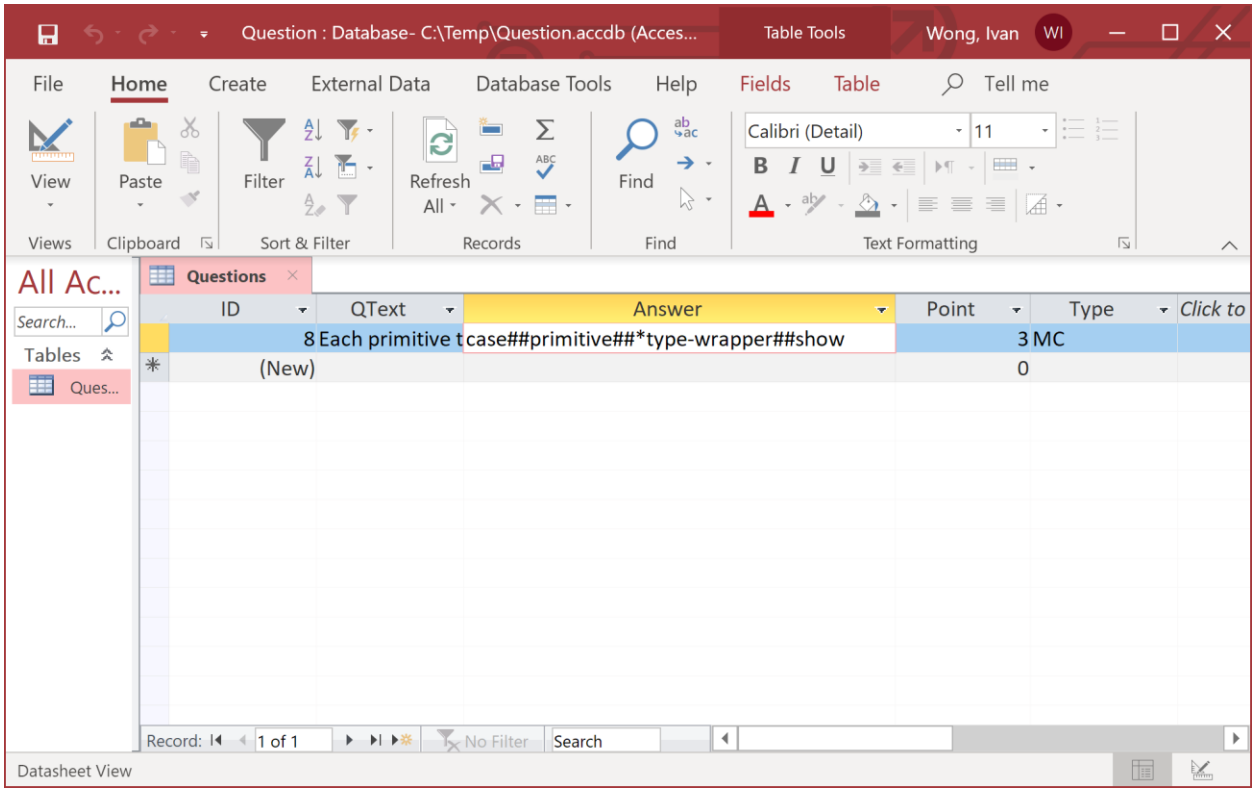


Figure 2: After creating the first question in the sample run.

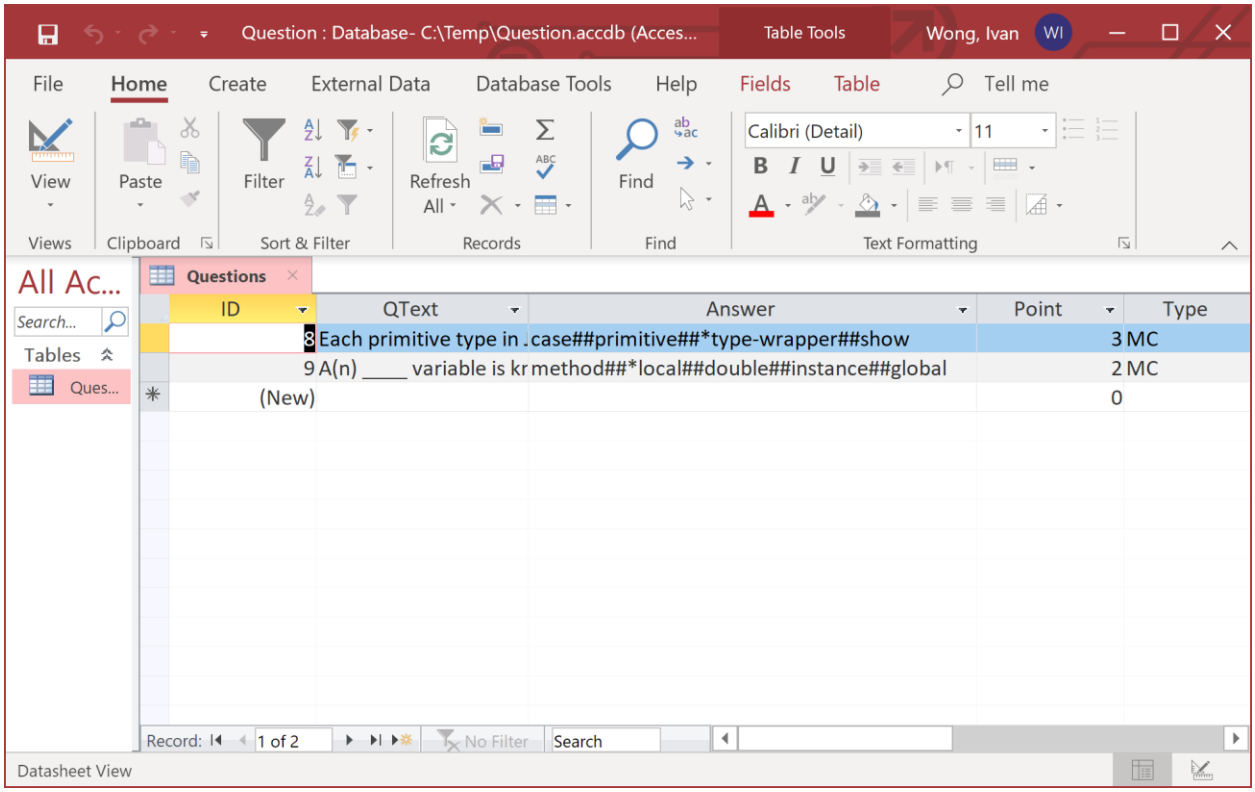


Figure 3: After creating the second question in the sample run.

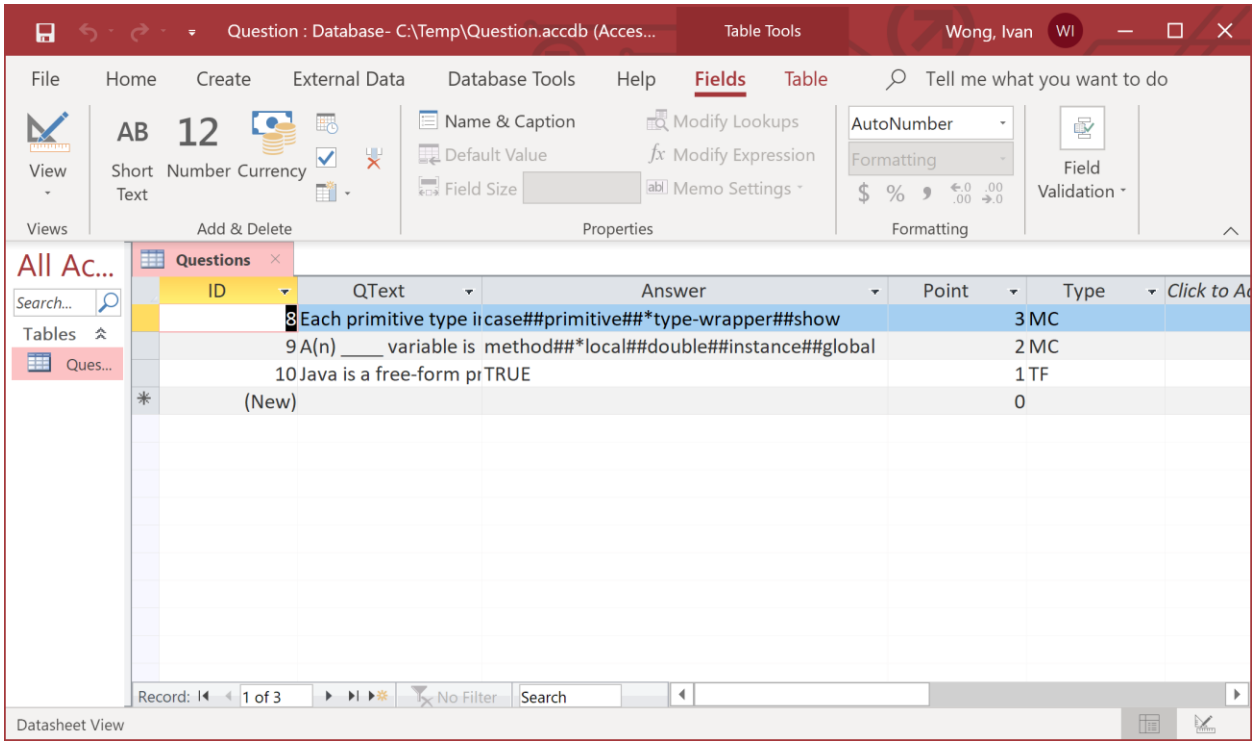


Figure 4: After creating the third question in the sample run.

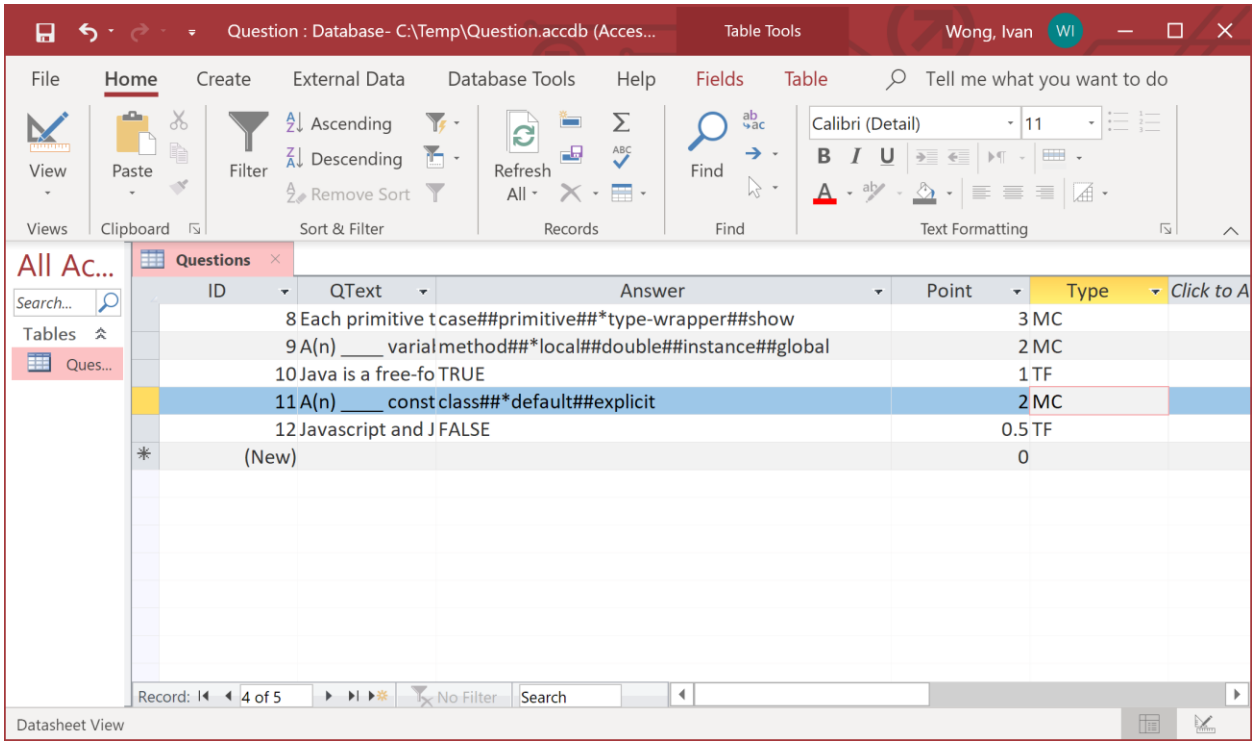


Figure 5: After terminating the sample run

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.