CMPSC 221   **Name:** _____

OO Programming with Web-Based Applications
Spring 2021
Due Date: Wednesday, April 14th, 2021 (11:59 p.m. EDT)

Instructions: Please create a Java application to solve the following problem. Submit electronic (Canvas Dropbox) copies of your project files (specified below) and **two or more** sample runs to me by the deadline. For the electronic submission of your project: 1) place your Java source code file(s), Java class file(s), sample runs, and a JAR file of your program in a folder; 2) compress the folder; and 3) upload the compressed archive to Canvas. I recommend that you also place a "ReadMe" file with instructions for executing your JAR file in the folder. Documentation requirements follow the problem specification. **Important Note:** Please be sure to upload your Project 4 files to Canvas by the deadline. If you miss the deadline, you WILL automatically receive a grade of 0 (zero).

1. Create a Java application that implements a simple trivia game. Your trivia game must have a theme. Some possibilities include sports (e.g., baseball, hockey), movies (e.g., science fiction, adventure), television shows (e.g., crime drama, comedy), etc. Your game must be implemented with an actual GUI (Graphical User Interface), not `JOptionPane` dialog boxes. Implementing the GUI involves using a layout of your choice with appropriate labels, text fields, and buttons to realize your design. Additional features of the game include displaying the correct answer to a question (if answered incorrectly) and computing the player's score. The scoring feature involves assigning a point value between 1 and 3 (inclusive) to an answer depending on the difficulty level of the corresponding question.

    When the program begins, it displays a welcome message in the title bar of the GUI and immediately displays the first trivia question. If the player answers the question correctly, s/he wins the number of points for that question; otherwise, the player wins no points. The player's score is updated after each question s/he answers. The program continues to display trivia questions until there are no more questions to display or the player chooses to quit. As usual, your program output should resemble the sample runs at the end of this document.

    Implementation Requirements:
    *   Each question **must** be selected consecutively or randomly from a minimum of 10 `Question` objects stored in an array or `ArrayList`. (Note: Reading the questions, answers, and point values from a text file is *optional* for this assignment.)
    *   You **must** use a minimum of two classes to implement this program: a "driver" containing `main` and a `Question` class.
    *   A `Question` object **must** have 3 attributes: question (`String`), answer (`String`), and point value (`int`).
    *   **Required** methods for the `Question` class include:
        o   A three-argument constructor that initializes the three instance variables (specified above).
        o   *set* and *get* methods for each of the three instance variables.
    *   The players' responses **must** be case-insensitive and all leading and trailing spaces **must** be ignored.
    *   You **must** use `swing` and `awt` classes to implement the GUI.
    *   The program **must** end when the close-window button (×) is clicked.
    References:
    *   Savitch, 6th Edition: Chapters 1 – 4 (basics), Chapter 5 (static methods and static variables), Chapter 6 (arrays), Chapter 14 (class `ArrayList`), Chapter 17 (`swing`)
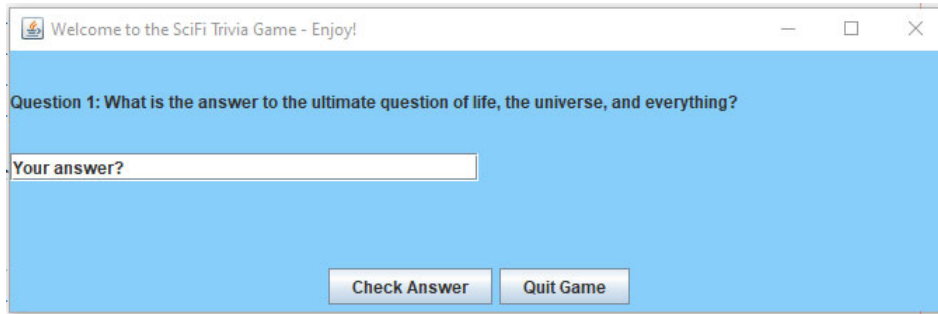
Documentation Requirements:

1) Each program source code file (i.e., Java class) must have a header at the beginning of the class containing the following:

   - Name of author, PSU e-mail address of author, name of course, assignment number and due date, name of file, purpose of class, compiler/IDE, operating system, and any external references used (e.g., Website)
   - Example:

```
/*
Author:        Wanda Kunkle
E-mail:        wmk12@psu.edu
Course:        CMPSC 221
Assignment:    Programming Assignment 4
Due date:      4/14/2021
File:          SciFiTriviaGame.java
Purpose:       Java application that implements a simple sci-fi trivia game
               with a GUI
Compiler/IDE:  Java SE Development Kit 14.0.2/IntelliJ IDEA 2020.3.1
Operating
system:        MS Windows 10 Home
Reference(s):  Java 14 API - Oracle Documentation
               (https://docs.oracle.com/en/java/javase/14/docs/api/);
               (Include ALL additional references (Web page, etc.) here.)
*/
```

2) The purpose of each method in the source code file(s) must be documented as shown in the example below. I prefer that you use the **javadoc** comment style.

```
/** This method checks a given response for correctness.
 *
 * @param response     The response to check
 * @return             True if the response was correct, false otherwise
 */
public boolean checkAnswer(String response)
{
   // Method definition (i.e., body)
}
```

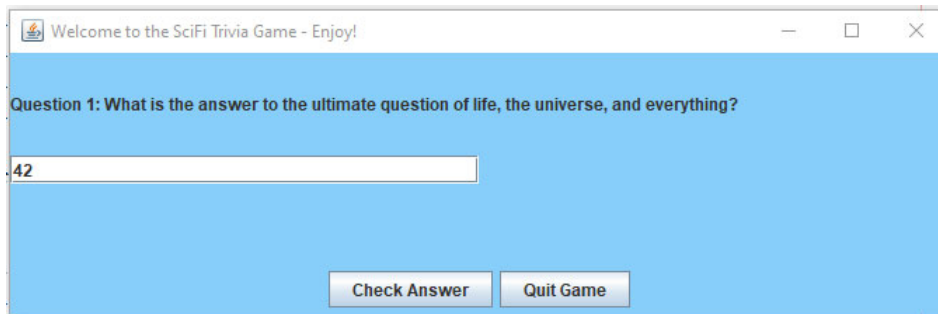Sample run #1 (*Player answers 4 questions, then quits.*):

(First question displayed)

(Answer entered)

(Answer checked and scored, second question displayed)

(Answer entered)

Welcome to the SciFi Trivia Game - Enjoy!

Question 3: In what U.S. state is Warehouse 13 located?

Your answer?

Sorry, but no. The correct answer is Majel Barrett. Your score is 1.

Check Answer   Quit Game

(Answer checked and scored, third question displayed)
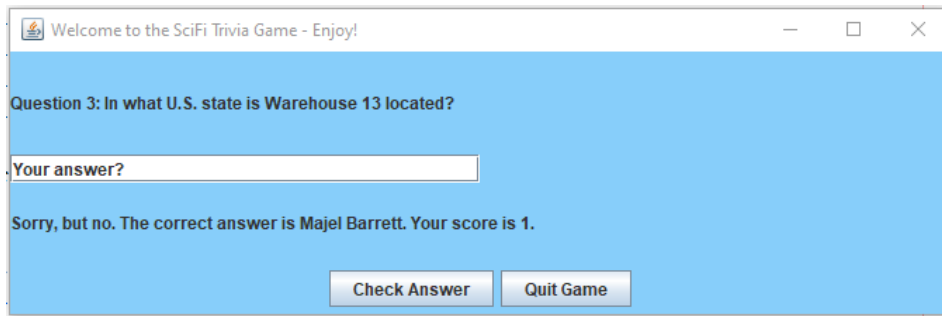

Welcome to the SciFi Trivia Game - Enjoy!

Question 3: In what U.S. state is Warehouse 13 located?

SoUtH DAKoTa

Sorry, but no. The correct answer is Majel Barrett. Your score is 1.

Check Answer   Quit Game

(Answer entered)

Welcome to the SciFi Trivia Game - Enjoy!

Question 4: What is the name of the ship used by Doctor Who to travel through space and time?

Your answer?
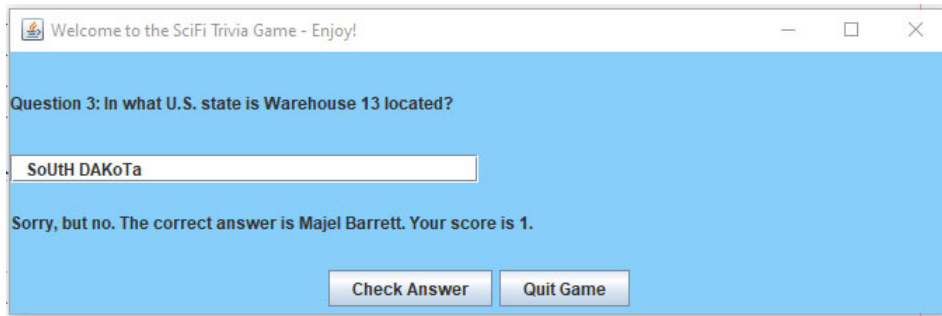
That is correct! Your score is 3.

Check Answer   Quit Game

(Answer checked and scored, fourth question displayed)

Welcome to the SciFi Trivia Game - Enjoy!

Question 4: What is the name of the ship used by Doctor Who to travel through space and time?

tArDIs

That is correct! Your score is 3.

Check Answer   Quit Game

(Answer entered)

Welcome to the SciFi Trivia Game - Enjoy!

Question 5: What Stargate SG-1 cast member previously starred in the TV series MacGyver?

Your answer?

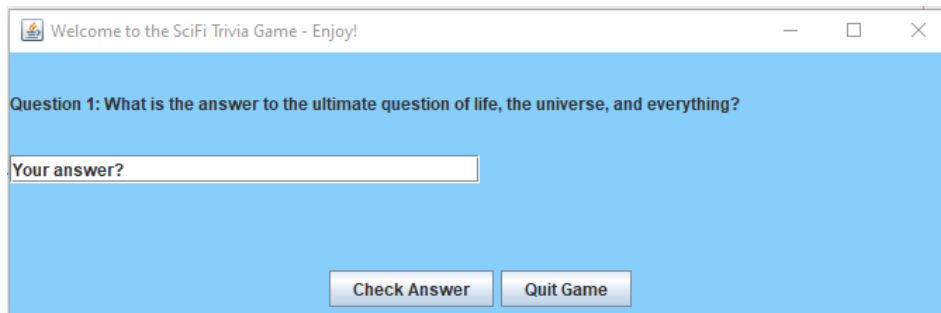That is correct! Your score is 4.

Check Answer   Quit Game
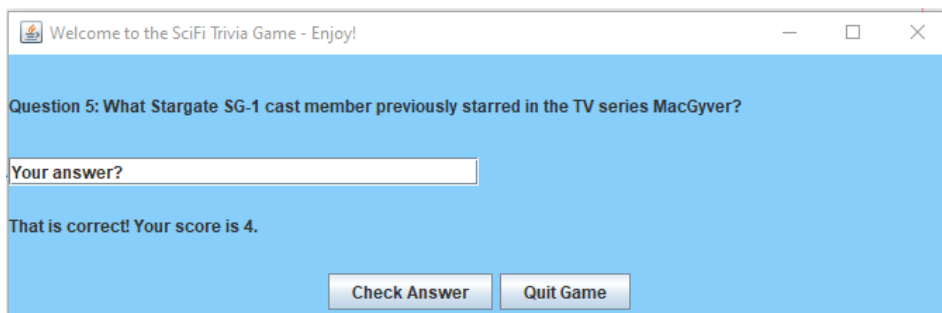
(Answer checked and scored, player quits game)

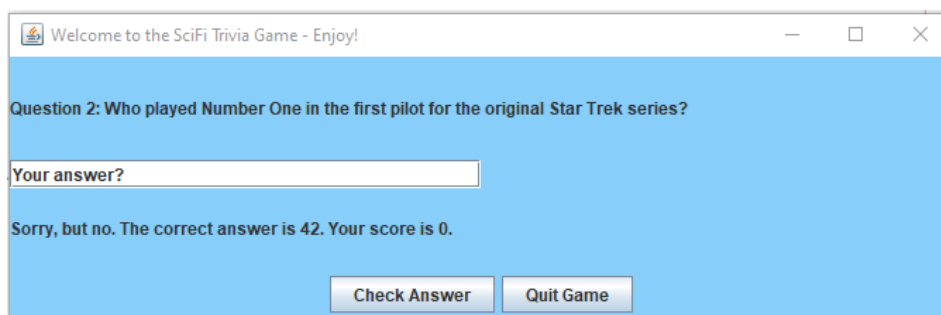Sample run #2 (*Player submits default response for first question, answers second question correctly, then quits.*):

Welcome to the SciFi Trivia Game - Enjoy!   — □ ✕

Question 1: What is the answer to the ultimate question of life, the universe, and everything?

Your answer?

Check Answer   Quit Game

(First question displayed)

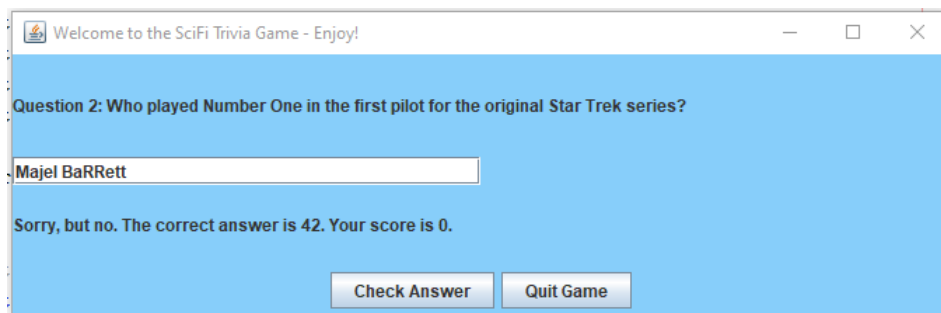**Welcome to the SciFi Trivia Game - Enjoy!**   — □ ✕

Question 2: Who played Number One in the first pilot for the original Star Trek series?

Your answer?

Sorry, but no. The correct answer is 42. Your score is 0.

Check Answer   Quit Game

(Player clicks Check Answer without entering a valid answer, second question displayed)

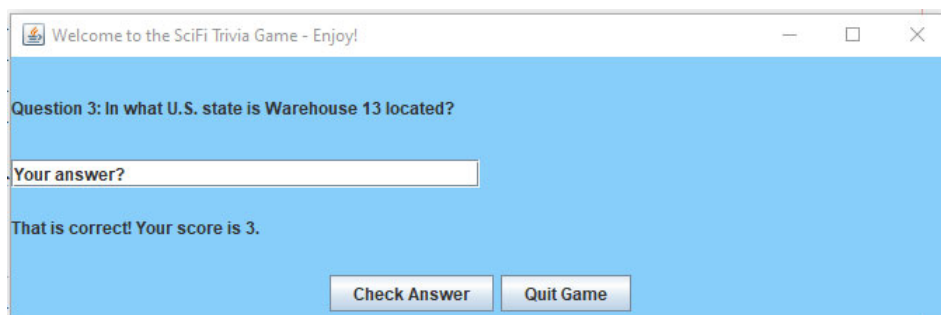**Welcome to the SciFi Trivia Game - Enjoy!**   — □ ✕

Question 2: Who played Number One in the first pilot for the original Star Trek series?

Majel BaRRett

Sorry, but no. The correct answer is 42. Your score is 0.

Check Answer   Quit Game

(Answer entered)

Welcome to the SciFi Trivia Game - Enjoy!   — □ ✕

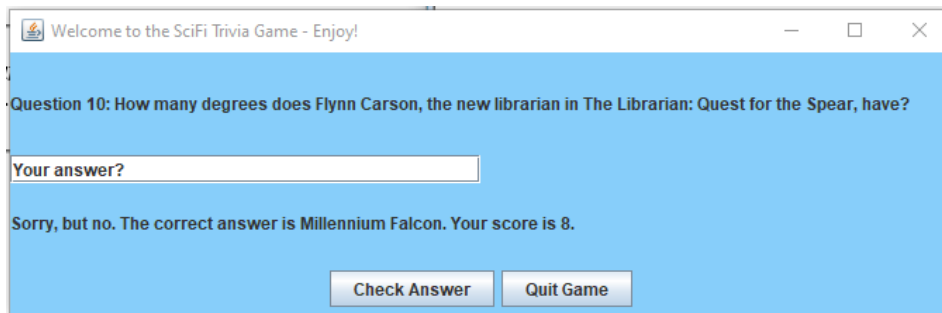Question 3: In what U.S. state is Warehouse 13 located?
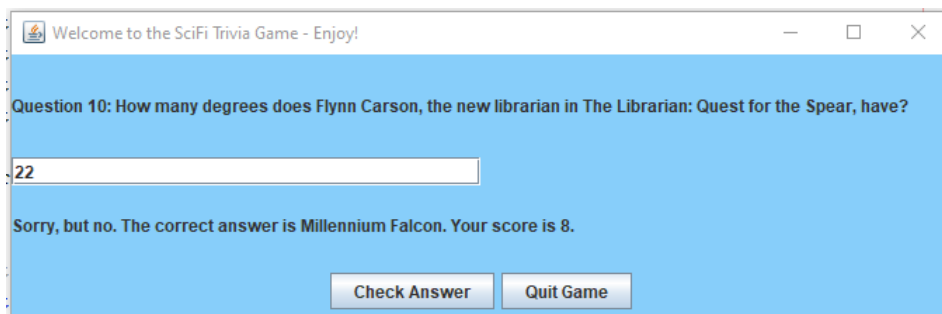
Your answer?

That is correct! Your score is 3.

Check Answer   Quit Game

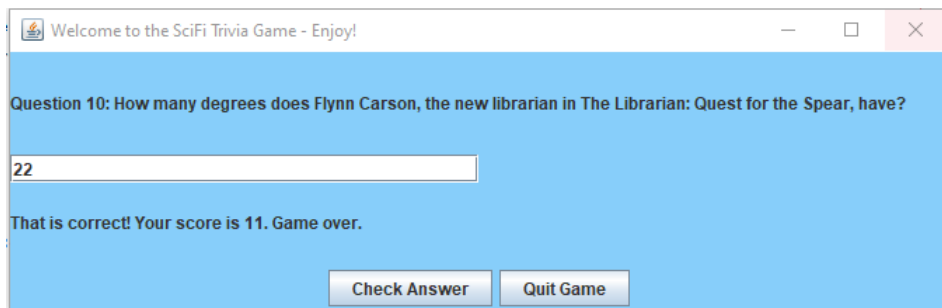(Answer checked and scored, player quits game)

Sample run #3 (*Player answers all 10 questions and checks all answers, then clicks Check Answer again, after which the player quits. Note: Only the last part of the run is displayed.*):

Welcome to the SciFi Trivia Game - Enjoy!

Question 10: How many degrees does Flynn Carson, the new librarian in The Librarian: Quest for the Spear, have?

`Your answer?`

Sorry, but no. The correct answer is Millennium Falcon. Your score is 8.

[Check Answer] [Quit Game]

(Previous answer checked and scored, tenth question displayed)

Welcome to the SciFi Trivia Game - Enjoy!

Question 10: How many degrees does Flynn Carson, the new librarian in The Librarian: Quest for the Spear, have?

`22`

Sorry, but no. The correct answer is Millennium Falcon. Your score is 8.

[Check Answer] [Quit Game]

(Answer entered)

Welcome to the SciFi Trivia Game - Enjoy!

Question 10: How many degrees does Flynn Carson, the new librarian in The Librarian: Quest for the Spear, have?

`22`

That is correct! Your score is 11. Game over.

[Check Answer] [Quit Game]

(Answer checked and scored, displays game over)

Welcome to the SciFi Trivia Game - Enjoy!

No more questions!

`          `

Game over. Good bye!

[Check Answer] [Quit Game]
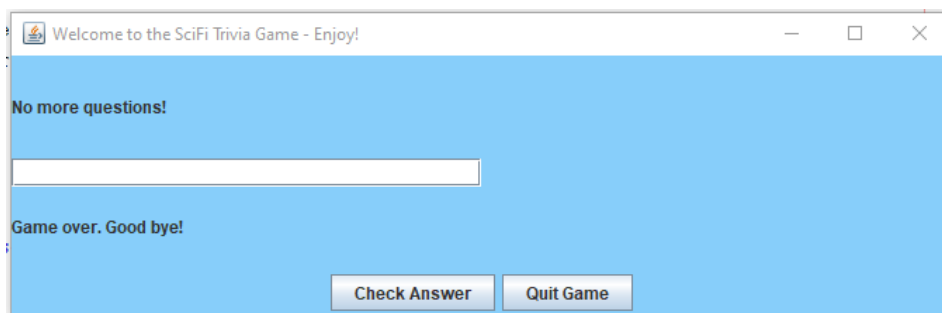
(Player clicks Check Answer again, then quits game)