Write a Java program to create a class called "Restaurant" with attributes for menu items, prices, and ratings, and methods to add and remove items, and to calculate average rating.

Sample Solution:

Java Code:

```
// Restaurant.java
// Import the ArrayList class
import java.util.ArrayList;

// Define the Restaurant class
public class Restaurant {
  // Declare ArrayLists to store menu items, prices, ratings, and item cour
  private ArrayList menuItems;
  private ArrayList prices;
  private ArrayList ratings;
  private ArrayList itemCounts;

  // Constructor to initialize the ArrayLists
  public Restaurant() {
    // Initialize the menuItems ArrayList
    this.menuItems = new ArrayList();
    // Initialize the prices ArrayList
    this.prices = new ArrayList();
    // Initialize the ratings ArrayList
    this.ratings = new ArrayList();
    // Initialize the itemCounts ArrayList
    this.itemCounts = new ArrayList();
  }

  // Method to add an item to the menu
  public void addItem(String item, double price) {
    // Add the item to the menuItems ArrayList
    this.menuItems.add(item);
    // Add the price to the prices ArrayList
    this.prices.add(price);
    // Initialize the rating for the item to 0
    this.ratings.add(0);
    // Initialize the item count for the item to 0
    this.itemCounts.add(0);
```

```
    }

    // Method to remove an item from the menu
    public void removeItem(String item) {
      // Get the index of the item in the menuItems ArrayList
      int index = this.menuItems.indexOf(item);
      // If the item exists in the menu
      if (index >= 0) {
        // Remove the item from the menuItems ArrayList
        this.menuItems.remove(index);
        // Remove the corresponding price from the prices ArrayList
        this.prices.remove(index);
        // Remove the corresponding rating from the ratings ArrayList
        this.ratings.remove(index);
        // Remove the corresponding item count from the itemCounts ArrayList
        this.itemCounts.remove(index);
      }
    }

    // Method to add a rating to an item
    public void addRating(String item, int rating) {
      // Get the index of the item in the menuItems ArrayList
      int index = this.menuItems.indexOf(item);
      // If the item exists in the menu
      if (index >= 0) {
        // Get the current rating of the item
        int currentRating = this.ratings.get(index);
        // Get the current item count of the item
        int totalCount = this.itemCounts.get(index);
        // Update the rating of the item
        this.ratings.set(index, currentRating + rating);
        // Update the item count of the item
        this.itemCounts.set(index, totalCount + 1);
      }
    }

    // Method to get the average rating of an item
    public double getAverageRating(String item) {
      // Get the index of the item in the menuItems ArrayList
      int index = this.menuItems.indexOf(item);
```

```
        // If the item exists in the menu
        if (index >= 0) {
            // Get the total rating of the item
            int totalRating = this.ratings.get(index);
            // Get the item count of the item
            int itemCount = this.itemCounts.get(index);
            // Calculate and return the average rating of the item
            return itemCount > 0 ? (double) totalRating / itemCount : 0.0;
        } else {
            // Return 0.0 if the item does not exist in the menu
            return 0.0;
        }
    }

    // Method to display the menu
    public void displayMenu() {
        // Loop through the menuItems ArrayList
        for (int i = 0; i < menuItems.size(); i++) {
            // Print the item and its price
            System.out.println(menuItems.get(i) + ": $" + prices.get(i));
        }
    }

    // Method to calculate the average rating of all items
    public double calculateAverageRating() {
        // Initialize totalRating to 0
        double totalRating = 0;
        // Initialize numRatings to 0
        int numRatings = 0;
        // Loop through the ratings ArrayList
        for (int i = 0; i < ratings.size(); i++) {
            // Add the rating to totalRating
            totalRating += ratings.get(i);
            // Increment numRatings
            numRatings++;
        }
        // Calculate and return the average rating
        return numRatings > 0 ? totalRating / numRatings : 0.0;
    }
}
```

The above Java class defines a restaurant with menu items, prices, and ratings. It has a constructor that initializes three ArrayLists for the menu items, prices, and ratings. It also has methods to add and remove items from the menu and add ratings for each item. The class also includes a method to calculate the average rating for a given menu item. It also includes a method to display the current menu.

```
// Main.java
// Define the Main class
public class Main {
  // Main method, the entry point of the application
  public static void main(String[] args) {
    // Create a new Restaurant object
    Restaurant restaurant = new Restaurant();
    // Add a Burger item with a price of $8.99 to the menu
    restaurant.addItem("Burger", 8.99);
    // Add a Pizza item with a price of $10.99 to the menu
    restaurant.addItem("Pizza", 10.99);
    // Add a Salad item with a price of $6.00 to the menu
    restaurant.addItem("Salad", 6.00);

    // Print the menu header
    System.out.println("Menu: Item & Price");
    // Display the menu items and their prices
    restaurant.displayMenu();

    // Add a rating of 4 to the Burger item
    restaurant.addRating("Burger", 4);
    // Add a rating of 5 to the Burger item
    restaurant.addRating("Burger", 5);
    // Add a rating of 3 to the Pizza item
    restaurant.addRating("Pizza", 3);
    // Add a rating of 4 to the Pizza item
    restaurant.addRating("Pizza", 4);
    // Add a rating of 2 to the Salad item
    restaurant.addRating("Salad", 2);

    // Get the average rating for the Burger item
    double averageRating = restaurant.getAverageRating("Burger");
    // Print the average rating for the Burger item
    System.out.println("\nAverage rating for Burger: " + averageRating);
```

```
        // Get the average rating for the Pizza item
        averageRating = restaurant.getAverageRating("Pizza");
        // Print the average rating for the Pizza item
        System.out.println("Average rating for Pizza: " + averageRating);
        // Get the average rating for the Salad item
        averageRating = restaurant.getAverageRating("Salad");
        // Print the average rating for the Salad item
        System.out.println("Average rating for Salad: " + averageRating);
        // Print the overall average rating for all items
        System.out.println("Average rating: " + restaurant.calculateAverageRati

        // Print a message indicating that the Pizza item will be removed
        System.out.println("\nRemove 'Pizza' from the above menu.");
        // Remove the Pizza item from the menu
        restaurant.removeItem("Pizza");
        // Print the updated menu header
        System.out.println("\nUpdated menu:");
        // Display the updated menu items and their prices
        restaurant.displayMenu();
    }
}
```

The Main class contains the main function that creates an object of the Restaurant class and calls its methods to add, remove, and display menu items, as well as add ratings and calculate average ratings for those items.

Sample Output:

```
Menu:
Burger: $8.99
Pizza: $10.99
Salad: $6.0
Average rating: 4.666666666666667
Remove 'Pizza' from the above menu.

Updated menu:
Burger: $8.99
Salad: $6.0
```

Flowchart: