Programming Exercise: Breakfast Class

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Exercise Description:

Implement a **Breakfast** class in Java to manage breakfast menus for various locations (restaurant). The class should allow adding, removing, and displaying menu items. Additionally, you need to track the total number of orders placed across all instances of the **Breakfast** class.

Your implementation should adhere to the following specifications:

1. The **Breakfast** class should have the following instance variables:
   - **location**: A string representing the location of the breakfast place or restaurant.
   - **menu**: An array to store menu items.
   - **menuSize**: An integer representing the current size of the menu.
2. Implement a constructor **Breakfast(String location, int maxMenuSize)** to initialize a new breakfast location with the given name and maximum menu size.
3. Implement the following methods:
   - **addToMenu(String item)**: Adds a new item to the menu if there is space available in the menu array.
   - **removeFromMenu(String item)**: Removes an item from the menu by shifting subsequent items to fill the gap left by the removed item.
   - **displayMenu()**: Prints the current menu items to the console.
4. Implement a static variable **totalOrders** to track the total number of orders placed across all instances of the **Breakfast** class.
5. Implement a static method **placeOrder()** to place an order and increment the **totalOrders** count.
6. Your task is to write the Java code for the **Breakfast** class according to the provided specifications. Additionally, write a **main** method to demonstrate the functionality of the **Breakfast** class by creating instances, adding items to the menu, placing orders, and displaying the menu.
7. Once you have completed the implementation, test your code thoroughly to verify that it functions as expected.

Source code

```
public class Breakfast {
    private String name;         // Name of the
       breakfast place
    private String[] menu;       // Array to store menu
        items
    private int menuSize;        // Current size of the
        menu
    private static int totalOrders = 0;  // Static
       variable to track total orders

    // Constructor to initialize the Breakfast object
       with a given name and maximum menu size
    public Breakfast(String name, int maxMenuSize) {
        this.name = name;
        this.menu = new String[maxMenuSize];   //
           Initialize the menu array with the
           specified size
        this.menuSize = 0;                      //
           Initialize the menu size to zero
    }

    // Method to add a new item to the menu
    public void addToMenu(String item) {
        // Check if there is space available in the
           menu array
        if (menuSize < menu.length) {
            menu[menuSize] = item;   // Add the item
               to the next available position in the
               array
            menuSize++;              // Increment the
               menu size
        } else {
            System.out.println("Menu is full. Cannot
               add more items.");
        }
    }

    // Method to remove an item from the menu
    public void removeFromMenu(String item) {
        boolean found = false;
        // Iterate through the menu array to find the
           item
        for (int i = 0; i < menuSize; i++) {
            if (menu[i].equals(item)) {
```

```
                found = true;
                // Shift the subsequent items to fill
                    the gap left by the removed item
                for (int j = i; j < menuSize - 1; j++)
                    {
                    menu[j] = menu[j + 1];
                }
                // Set the last element to null and
                    decrement the menu size
                menu[menuSize - 1] = null;
                menuSize--;
                break;
            }
        }
        if (!found) {
            System.out.println(item + " is not found
                in the menu.");
        }
    }

    // Method to display the current menu
    public void displayMenu() {
        System.out.println("Menu for " + name + ":");
        // Iterate through the menu array and print
            each item
        for (int i = 0; i < menuSize; i++) {
            System.out.println("- " + menu[i]);
        }
    }

    // Static method to place an order
    public static void placeOrder() {
        totalOrders++;
        System.out.println("New order placed. Total
            orders: " + totalOrders);
    }

    // Main method for testing the Breakfast class
    public static void main(String[] args) {
        // Create a new Breakfast object with the name
            "Morning Delight" and maximum menu size of
            5
        Breakfast breakfast = new Breakfast("Morning
            Delight", 5);

        // Add some items to the menu
```

```
68          breakfast.addToMenu("Eggs␣Benedict");
69          breakfast.addToMenu("Pancakes");
70          breakfast.addToMenu("Bacon␣and␣Eggs");
71          breakfast.addToMenu("Solid␣Ham");
72          breakfast.addToMenu("Fish␣Sandwich");
73
74          // Display the initial menu
75          breakfast.displayMenu();
76
77          // Place an order (static method)
78          Breakfast.placeOrder();
79
80          // Remove an item from the menu
81          breakfast.removeFromMenu("Pancakes");
82          System.out.println("\nAfter␣removing␣Pancakes:
                ");
83
84          // Display the updated menu
85          breakfast.displayMenu();
86      }
87  }
```