Lab 5

Students are provided the Checklist and they must identify and explore each type of general errors that may arise during inspection session.

Checklist :

Data Declaration Errors:

1. All variables declared?

2. Default attributes understood?

3. Arrays and strings initialized properly?

4. Correct lengths, types, and storage classes assigned?

5. Initialization consistent with storage class?

6. Any variables with similar names?

Code :

```java
// Online Java Compiler
// Use this editor to write, compile and run your Java code online
import java.util.*;
public class Checklist {
    public static boolean allVariablesDeclared(String code) {
        return code.contains("int") || code.contains("double") || code.contains
            ("String");
    }
    public static boolean defaultAttributesUnderstood(String code) {
        return code.contains("public") || code.contains("private") || code
            .contains("static");
    }
    public static boolean arraysStringsInitializedProperly(String code) {
        return code.contains("new int") || code.contains("new double") || code
            .contains("new String");
    }
    public static boolean correctAttributesAssigned(String code) {
        return code.contains("length") || code.contains("type") || code.contains
            ("storage");
    }
    public static boolean initializationConsistentWithStorageClass(String code) {
        return code.contains("static") || code.contains("dynamic");
    }
    public static boolean variablesWithSimilarNames(String code) {
        List<String> variables = Arrays.asList(code.split("\\s+"));
        Set<String> uniqueVariables = new HashSet<>(variables);
     return variables.size() != uniqueVariables.size();
}
public static void main(String[] args) {
    String code = "int x = 5;\n" +
            "int y;\n" + "double z;\n" + "String name = \"Mahnoor\";\n" +
            "int[] numbers = {1, 2, 3};\n" + "String[] words = new String[5]
                ;\n" +"private static double pi = 3.14;\n" + "int length =
                numbers.length;\n" +"static int staticVar = 10;\n" + "int
                dynamicVar;\n" + "int x = 10;\n" + "int x = 20;\n";
    System.out.println("\nTest applying the checklist:");
    System.out.println("All variables declared? " + allVariablesDeclared(code
        ));
    System.out.println("Default attributes understood? " +
        defaultAttributesUnderstood(code));
    System.out.println("Arrays and strings initialized properly? " +
        arraysStringsInitializedProperly(code));
    System.out.println("Correct lengths, types, and storage classes assigned?
        " + correctAttributesAssigned(code));
    System.out.println("Initialization consistent with storage class? " +
        initializationConsistentWithStorageClass(code));
    System.out.println("Any variables with similar names? " +
        variablesWithSimilarNames(code));
}
```

Version 1

Error handling

Checklist	Error found
All variables declared?	Yes
Checklist Item	Error Found in First Version
All variables declared?	Yes
Default attributes understood?	No - Default attributes like public, private, and static are not present in variable declarations.
Arrays and strings initialized properly?	Yes
Checklist Item	Error Found in First Version

Version 2

Data validation

Description	Expected result	Actual outcome	Status
Test All Variables Declared	All variables declared.	All variables declared.	Pass
Test Default Attributes Understood	Default attributes like public, private, and static are present in variable declarations.	Default attributes are present in variable declarations.	Pass
Test Arrays and Strings Initialized Properly	Arrays and strings are initialized properly.	Arrays and strings are initialized properly.	Pass
Test Correct Attributes Assigned	Lengths, types, and storage classes are properly assigned.	Attributes assigned correctly.	Pass
Test Initialization Consistent with Storage Class	Initialization is consistent with the storage class.	Initialization consistent with storage class.	Pass
Test Any Variables with Similar Names	Duplicate variable names found.	Duplicate variable names found.	Pass