Homework 6: Changes and Fixes

This document outlines the changes made to the hw6 code to resolve compilation and test issues.

Issue 1: Serialization Warnings Treated as Errors

Submitty was using `-Werror` flag, causing serialization warnings to be treated as errors.

Main Problems:

1. Missing `serialVersionUID` in exception classes

2. Non-serializable fields in `SharedSetCountsTask` serializable class

Changes in `MalformedDataException.java`:

```
public class MalformedDataException extends RuntimeException {
    private static final long serialVersionUID = 1L; // Added this line

    // Rest of the class unchanged
}
```

Changes in `LegoParser.java` (inner MalformedDataException):

```
public static class MalformedDataException extends IOException {
    private static final long serialVersionUID = 1L; // Added this line

    // Rest of the class unchanged
}
```

Changes in `LegoPaths.java` (SharedSetCountsTask class):

```
private static class SharedSetCountsTask extends RecursiveAction {
    private static final long serialVersionUID = 1L;

    // Added transient to non-serializable fields
    private final transient List<Set<String>> partsSets;
    private final int start;
    private final int end;
    private final transient Map<String, Map<String, Integer>> sharedCounts
    ;

    // Rest of the class unchanged
}
```

Issue 2: Package Visibility and Structure

Tests could not properly access internal classes, and there were issues with cross-package dependencies.

Main Problems:

1. Inner benchmark classes not accessible to tests

2. Cross-package references between hw4 and hw6 improperly handled

Solution:

1. Extracted `BenchmarkRunner` and `BenchmarkResult` into separate public classes

2. Modified the build process and imports to ensure hw4 classes were properly accessible to hw6

Issue 3: Properly Testing in a Submission-Like Environment

Local tests passed but Submitty tests failed due to environmental differences.

Added Custom Gradle Task:

```
// Task that mimics Submitty's strict compilation
task compileWithSubmittySettings(type: JavaCompile) {
    source = fileTree(dir: 'src/main/java', includes: ['hw6/**/*.java', '
  hw4/**/*.java'])
    classpath = sourceSets.main.compileClasspath
    destinationDirectory = file("$buildDir/classes/submitty")

    options.compilerArgs << '-Xlint:all' // Enable all warnings
    options.compilerArgs << '-Werror'    // Treat warnings as errors

    // Print the command being run
    doFirst {
        println "Running compilation with Submitty-like settings (warnings
  as errors):"
        println "Files being compiled: ${source.files.size()}"
        source.files.each { println "  - ${it.path.replace(project.
  projectDir.toString() + '/', '')}" }
    }
}
```

This task allowed us to catch the same warnings that would be treated as errors in Submitty, ensuring our code would pass compilation in the grading environment.

Results and Verification

After making these changes:

1. All tests pass locally: `./gradlew test` runs successfully

2. The strict compilation check passes: `./gradlew compileWithSubmittySettings` completes without errors

3. Build process succeeds: `./gradlew build` passes all checks

These changes ensured that the code would be properly compiled and tested in the Submitty environment, resolving the submission issues.