Programming Assignment Requirements

Note the following requirements for **ALL** programming assignments throughout the **entire** semester:

- **THE OVERRIDING RULE IS: KEEP IT SIMPLE!!!!!!** In general, a simpler program works for some cases is better than a complicated program that does not work for any cases. Programs that fail to compile will receive a 0.
- Your programs must demonstrate good design with efficient implementations. You are responsible for all of the implementation, including when a generated/default/inherited implementation is provided (e.g., toString, equals, hashCode, etc.)
- Your program must be written using appropriate facilities in the **latest** (as of the first day of class) production release of Java.
- Test your program thoroughly. Use a code coverage tool to make sure you test every testable line. For unit testing, you must use the **latest** (as of the first day of class) production release JUnit.
- Make sure you follow all Coding Conventions/Guidelines and preparation instructions from the class web page, assignment instructions, and deliverable specifications.
- Distrust any external (i.e., from network, users, files, telepathy, etc.) input.
- Your programs should not print anything to the console unless specifically instructed to do so. In particular, unit test and library classes should print **nothing** to the console. Of course, when appropriate, you should output to a log.
- Your program should gracefully handle problems such as system call failures.
- Starting from two days after you receive an assignment, you are **required** to upload the latest version of your program to the upload site on every **even** day leading up to the due date as well as the final due date. Each version should show steady, meaningful progress. For example, if the assignment is given on the 12\text{th}, you must start your every even day submission on the 14\text{th}. If the assignment is given on the 15\text{th}, you must start your every even day submission on the 18\text{th}.
- You must precisely follow the complete specification for any assignment; however, any given specification (interface, classes, tests, etc.) defines the **minimum**. It does NOT, in any way, prevent you from having additional classes and methods. In fact, a good design will likely have additional elements. This does not prevent you from having less restrictive access permissions. Any interface specification is just for the prototype information (e.g., class/method name, parameter/return types, static or non-static).
- Determination of which classes/methods should be abstract and/or overridden is yours according to good design.
- Friendly heads-up: The programming assignments for this class will build on one another. This means that each program may depend on one or more of its predecessors.
- For each assignment, you **MUST** turn in solutions for **all** previous assignments. For example, when you turn in Program 2, it **must** contain everything from Program 0 and Program 1. Each submission should be fully contained (i.e., should not need to frankenstein previous and current submission together to get a working version). Code from previous assignment must be corrected; note well that code from previous assignments may be graded.
- You will submit your code as a zip file to the upload site at [http://csi-info.baylor.edu/upload](http://csi-info.baylor.edu/upload). Your archive should contain ONLY source code files (e.g., no compiled files). Your code should be contained in directories corresponding to their packages; **no** other directories should be used in your archive. Your program must contain all files necessary for self-contained compilation and execution except standard (e.g., junit) and provided (i.e., by me) JARS.
- Keep a copy of the final zip you submit. This will be helpful when you are running my tests against your final submission.
- Always run Test Program on your final submission on the upload site. You should either see nothing or SUCCESS. Anything else is a potential problem that must be corrected.
- Always run your tests on your final submission. Do not fully test, then make one last change that you “know” won’t break anything, and then submit.
- For hard copies, you only need to print Java files that are **new** for this current assignment. Make sure your hard copy includes all code (e.g., including code collapsed by IDE). Code should be printed landscape with two columns; format your code such that such printing does not add line breaks. Your printed code should be easily readable. Source hardcopies should be submitted in alphabetical order (case insensitive) by public class name. The package name is part of the class name (sample print ordering: pkg1.class2, pkg2.class1, pkg2.class3).
- Your protocol implementations should be robust; they should gracefully handle failures, whether accidental or malicious. Implementations must 1) assume failures are common and 2) behave defensively (i.e., input is not to be trusted). The applicable adage is that you should “be conservative in what you believe.” The Heartbleed vulnerability failed in this respect because it believed that the message length in the message header was the actual message length; hackers took advantage of this misplaced trust. Implementations should also expose errors. Violations of the protocol specification should generate errors. For example, if you expect "123" and get "123ABC", it should be failure that generates an error. Note well that this may contradict a long-held Internet principle to be “conservative in what you send and liberal in what you accept.” In this case, you might ignore the ABC at the end because you got the 123). For this class, we’ll go with **strict protocol adherence**. Some examples of how this applies include (but are not limited to):
  - Reject messages with extraneous bytes
  - Reject messages with explicitly incorrect values. For example, if the protocol specifies that a bit must be 0, then reject if it is 1. If the protocol does not specify the semantics or values, you should not reject (i.e., just ignore). For example, if a bit is “RESERVED” but no value is specified, then you should completely ignore the value.

Why this approach? The idea is that this may provide better security. In addition, for new protocols, a strict interpretation will help avoid implementation oddities creeping into the protocol for the sake of compatibility (e.g., We’ve changed the protocol to allow X because the major implementations already do X and we don’t want to break things). Note that there is not general agreement on this. Some would say be “liberal in what you accept” and that such strictness 2) limits flexibility in protocol evolution and 2) in the case of inevitable protocol ambiguity may result in two complaint endpoints not being able to communicate.

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