Assignment 4: Tests, Contracts, Aspects

(to be done by the same team as for Parts 1 and 2)

Due: Tuesday, November 24, 11:59 pm

Part 3: Contracts as Aspects

Install AspectJ as an Eclipse plugin using the update site given in Lecture 20 slide #23:

    http://download.eclipse.org/tools/ajdt/410/dev/update

The file A4_Part3.zip contains three files: MyStack.java, MyStackAspect_Outline.aj, and A4-Part3-Screen-Shot.png. File MyStack.java contains a monomorphic version of the stack datatype discussed in Lecture 18 slides 43-44. Also shown (as comments) in class MyStack are the contracts for push and pop and the class invariant.

Your task in this part is to develop a file called MyStackAspect.aj incorporating the stack contracts as an AspectJ *aspect* called MyStackAspect. Within this aspect, you should define two *pointcuts* and associated *advice*, one pointcut for the push contract and the other for the pop contract. An outline of the code to be developed is given in MyStackAspect_Outline.aj.

How to develop MyStackAspect.aj:

- In Eclipse, create an AspectJ project by doing: File → New → Project → AspectJ → AspectJ Project. Enter the name MyStack as the name of the project.
- Right-click on project and import the file MyStack.java.
- Right-click again on the project and choose New → Other → AspectJ → Aspect. Click Next and enter the name MyStackAspect. A skeletal aspect with this name will be created.
- Complete its definition as indicated in the outline file. A screen-shot of a sample run is given in the file A4-Part3-Screen-Shot.png. The sequence diagram shown there provides more detailed guidance on the sequence of actions to be taken in the before/after advice

Once developed, set up **Debug Configurations** for the project, and enter and apply (one by one) the following entries in the **Exclusion Filter** under the JIVE tab.

    org.aspectj.*
    jdk.*

Enable debugging with JIVE. Run the project in Debug mode and save the **Sequence Diagram** in a file called A4_Part3.png. In a correct run of the program, the Console output should show the number 100 and an exception called java.lang.AssertionError.

What to Submit. Prepare a top-level directory named *A4_Part3_UBITId1_UBITId2* if the assignment is done by a team of two students; otherwise, name it as *A4_Part3_UBITId* if the assignment is done solo. (Order the *UBITId*s in alphabetic order, in the former case.) In this directory, place the files: MyStack.java, MyStackAspect.aj and A4_Part3.png. Compress the top-level directory and submit the compressed file using submit_cse522 (grads) or submit_cse410 (undergrads). Only one submission per team is required.

End of Assignment 4 Part 3