Assignment Description

In this assignment, you will be asked to determine how to perform three maintenance tasks in a relatively simple event-based (alternatively referred to as “message-based”) application. While performing these tasks, you will be expected to report the message-based dependencies either within a component or between components that you have examined in order to determine how to complete the task; note that you are not required to actually change the application’s code to complete this assignment; you are only required to note what parts of the application need to be changed to complete each maintenance task.

You will also need to explain why you ended up examining the dependencies you highlight. Given that you need to familiarize yourself sufficiently with the event-based application you are analyzing, you may find that you have also examined dependencies that, in the end, you determined to be irrelevant for the particular maintenance task you are performing. You should report these dependencies as well.

You will be assigned the maintenance tasks and the particular event-based application individually. Your application and/or tasks may be similar to some of your classmates’, but they will not be identical, so it is critical that you work on this assignment on your own. To obtain the maintenance tasks and the application you will be working on, please send an email to the TA with the subject “CSCI 578 Spring 2013 HW2 – Task Request”. You can expect a response from the TA within a few hours.

In this assignment, you will be able to use a few tools that can help you determine manually the message dependencies within and between components. In particular, for Windows, we will support the Eclipse IDE and its search and finding references features. In Unix-based systems, such as Linux and Mac OS X, we support the Eclipse IDE and basic Unix commands, such as grep, find, xargs, etc. You may use other tools, but we may not be able to help you with them.

You are also required to keep track of how much time and effort you placed into determining how to perform each maintenance task. Below we provide guidelines for tracking this information. We will track analogous information for the subsequent two assignments, as part of a separate research study helping us to determine the relative effectiveness of different program analysis techniques that are commonly used. Your grade will not depend on the amount of time and effort, but it will depend on the completeness and accuracy of the information you provide.
Structure of Your Report
System Assigned: <Name of system>

For each maintenance task, specify:
1) Task No:
2) Description of Task:
3) Components you examined:
   a) Names of the components you examined
   b) The reason you examined them
4) Message-based dependencies that are relevant to the maintenance task:
   a) For each component you examined, show the following information
      i) For each dependency within a component
         (1) Name of Class which contains the dependency:
            (a) Name and type of Consumed message
                (i) Names of consumed message’s attributes
                (ii) Name of the method or interface in which the message is consumed
            (b) Name and type of Published Message
                (i) Names of published message’s attributes
                (ii) Name of the method or interface in which the message is published
         (2) Why is this dependency relevant?
      ii) For each dependency between components
         (1) For each component involved in the dependency
            (a) Name of the component which published the message(source)
               (i) Name of the message or event
               (ii) Names of published message’s attributes
               (iii) Name of the method of the source component in which the message is published
            (b) Name of the component which consumed the message(sink)
               (i) Name of the message or event
               (ii) Names of consumed message’s attributes
               (iii) Name of the method of the sink component in which the message is consumed
         (2) Why is this dependency relevant?
5) Message-based dependencies that you examined in addition to the relevant dependencies:
   a) Use the same format as in 4)
6) Explanation of how the code would need to be modified in order to complete the maintenance task
   a) Questions that may need to be answered
      i) What message-based dependencies may need to be modified, added, or removed?
      ii) What methods need to be modified, added, or removed?
      iii) What variables or objects may need to be modified, added, or removed?
   b) Please explain why any methods, variables, objects, etc. are relevant to the maintenance task at hand.
7) Description of the **time and effort** required to perform the task  
   a) How much time and effort did it take to learn the tools that you used?  
      i) For each tool  
         (1) Name of the tool you used  
         (2) Time and effort in hours to learn – for accuracy, please keep track of and report fractions of an hour  
   b) What made learning the tools you used particularly challenging? For example, you may have had a hard time writing regular expressions for identifying message interfaces.  
   c) How difficult was it to find the message-based dependencies that are relevant to the task? For example, a component may be relatively small allowing you to quickly determine dependencies simply through code reading.  
      (1) More specific issues that you can discuss  
         (a) How long did it take to find the message-based dependencies for this task?  
         (b) How long did it take to determine if the message-based dependencies that you found were relevant?  
         (c) How long did it take to determine the parts of the task that did NOT involve message-based dependencies?  
   d) How important were the message-based dependencies that are relevant to the task? For example, determining how to modify a particular object in a component may be more challenging than actually determining the appropriate dependency that may need to be altered.  
      i) Issues to consider regarding this question  
         (1) Did the message-based dependency actually inform you exactly which parts of a component need to be modified? In other words, did tracking the dependency actually help you identify which specific statements, methods, variables, or objects needed to be modified?  
         (2) Did the task actually require modifying, adding, or removing one or more message-based dependencies?