Software Testing Comprehensive Exam

November 2004

ANSWER ANY FOUR OF THE FOLLOWING FIVE QUESTIONS.

Do not attempt more than four questions on the exam. If you answer five, pick your best four and *cross out the fifth*, the one you don't want us to grade. If you provide more than four answers, we will grade the first four and ignore the fifth.

1. Ostrand & Balcer described the category-partition method for designing tests. Their first three steps are:

   1) Analyze

   2) Partition, and

   3) Determine constraints

   Apply their method to this function:

   I, J, and K are unsigned integers. The program calculates

   K = IntegerPartOf (SquareRoot (I*J)).

   For this question, consider only cases in which you enter integer values into I and J. Do an equivalence class analysis from the point of view of the effects of I and J (jointly) on the variable K. List the values you would enter into I and J and explain why.

2. Consider the costs, benefits, and risks associated with developing and relying on an extensive suite of regression tests to test the software under test. List and briefly describe at least two costs, two benefits, and two risks associated with heavy reliance on regression testing in the following cases:

   - Today's date is January 4, 1999. We are patching our company's legacy software to make it Y2K compliant. We have the source code, but it has been modified by 42 people over the last 20 years. The few comments that are in the source code are often outdated and misleading.
   - The software under test was written over the past year by a small group of experienced programmers. They are all very smart and conscientious. When they fix bugs, they rarely make mistakes. Looking at their other projects, fewer than 1% of their fixes failed to fix the problem or broke something else. (Note: we're back in the present, and the Y2K problem is behind us.)
   - The software under test was written incrementally over the past year using extreme programming methods. The programmers are smart and conscientious. (Note: we're back in the present, and the Y2K problem is behind us.)

3. Consider testing the SAVE AS A WEB PAGE feature of Microsoft Word.

   - How would you develop a list of risks for this capability? (If you are talking to people, who would you ask and what would you ask them?) (If you are consulting books or

records or databases, what are you consulting and what information are you looking for in it?)

- Why is this a good approach for building a list of risks?
- List 6 risks associated with this function.
- For *two* of these risks, briefly (very briefly) describe a test that could determine whether there was an actual defect and explain why this is a good test for this risk.

4. We are going to do some configuration testing of Microsoft Word. We want to test it on the following configurations:
    - Windows 98, 2000, and XP (the latest service pack level of each)
    - Printing to an HP inkjet, a LexMark inkjet, and a Xerox laser printer,.
    - Connected to the web with a dial-up modem (28k), a DSL modem, and a cable modem
    - How many combinations are there of these variables?
    - Explain what an all-pairs combinations table is
    - Create an all-pairs combinations table
    - Explain why you think this table is correct.

5. Imagine that you are an external test lab, and Microsoft comes to you with the newest version of MS Word. They want you to test the product. How will you decide what test documentation to give them? (Suppose that when you ask them what test documentation they want, they say that they want something appropriate but they are relying on your expertise.) To decide what to give them, what questions would you ask (list 5 to 7 questions) and how would the answers to each of those questions guide you?