BBST FOUNDATIONS
STUDY GUIDE: JANUARY 2011 VERSION

SHORT ANSWER QUESTIONS

SHORT 1

What is the primary difference between black box and glass box testing? What kinds of bugs are you more likely to find with black box testing? With glass box?

SHORT 2

Describe a situation in which you would use self-verifying data as an oracle. (How would you use it; what type of data would you use it for.)

SHORT 3

Let's measure the productivity of programmers by counting their lines (statements) of code. Supposing that this is a measure of performance of programmers, is it a ratio-scaled measure of performance? Why or why not?

SHORT 4

X is a floating point number, stored to 5 decimal digits of precision. What set of numbers could you input to X that would be stored equivalently to PI? What set of numbers would be equivalent to PI/10000?

Note that pi equals
3.14159265358979323846264338327950288419716939937510582O...

Note: a test question might use different constants but would be identical to this question in all other respects.

SoftCo makes a word processing program. The program exhibits an interesting behavior. When you save a document that has exactly 32 footnotes, and the total number of characters across all footnotes is 1024, the program deletes the last character in the 32nd footnote. Think about the "Consistency with History" heuristic. Describe the type of research that you would do, and give an example of the type of argument you could make on the basis of that research, to argue that this behavior is inappropriate.

Note: Some students abandon their common sense when they answer this question. Think realistically about this bug as you consider your possible answers.

SHORT 5

SoftCo makes a word processing program. The program exhibits an interesting behavior. When you save a document that has exactly 32 footnotes, and the total number of characters across all footnotes is 1024, the program deletes the last character in the 32nd footnote. Think about the "Consistency with History" heuristic. Describe the type of research that you would do, and give an example of the type of argument you could make on the basis of that research, to argue that this behavior is inappropriate.

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SHORT 6

What does it mean to specify a test by describing the precondition state of the program (and the system it runs on), the steps you take during the test and the resulting post-condition state? (Define the terms.) Would this be a complete specification of the test? Why or why not? Is it practical to do this? Why or why not?

SHORT 7

Consider a program with two loops, controlled by index variables. The first variable increments (by 1 each iteration) from -3 to 20. The second variable increments (by 2 each iteration) from 10 to 20. The program can exit from either loop normally at any value of the loop index. (Ignore the possibility of invalid values of the loop index.) If these were the only control structures in the program, how many paths are there through the program?

- If the loops are nested?
- If the loops are in series, one after the other?

If you could control the values of the index variables, what test cases would you run if you were using a domain testing approach?

Please explain your answers with enough detail that I can understand how you arrived at the numbers.

Note: a question on the test might use different constants but be identical to this question in all other respects.

SHORT 8

A program asks you to enter a password, and then asks you to enter it again. The program compares the two entries and either accepts the password (if they match) or rejects it (if they don’t). An entry is "valid" if it contains only letters and/or digits and is neither too short nor too long. How many valid entries could you test? (Please show and/or explain your calculations.)

SHORT 9

Give two examples of defects you are likely to discover and five examples of defects that you are unlikely to discover if you focus your testing on line-and-branch coverage.

SHORT 10

How is it that you can achieve very high coverage from your tests but still miss lots of bugs?

SHORT 11

Why is it usually impossible to achieve complete path coverage? Use examples to clarify your answer.

LONG ANSWER QUESTIONS

LONG 1

Suppose you were testing a spreadsheet. Consider testing with each of these two information objectives: “Assess conformance to specifications” versus “Block premature product releases.” How might your testing be similar and how might it be different under these objectives.

LONG 2

SoftCo makes a word processing program. The program exhibits an interesting behavior. When you save a document that has exactly 32 footnotes, and the total number of characters across all footnotes is 1024, the program deletes the last character in the 32nd footnote.

- Think about the "Consistency with our Image" heuristic. Describe the type of research that you would do, and give an example of the type of argument you could make on the basis of that research, to argue that this behavior is inappropriate.
- Think about the "Consistency with Comparable Products" heuristic. Describe the type of research that you would do, and give an example of the type of argument you could make on the basis of that research, to argue that this behavior is inappropriate.
- Think about the "Consistency within Product" heuristic. Describe the type of research that you would do, and give an example of the type of argument you could make on the basis of that research, to argue that this behavior is inappropriate.

Note: Some students abandon their common sense when they answer this question. Think realistically about this bug as you consider your possible answers.

LONG 3

What is the Defect Arrival Rate? Some authors model the defect arrival rate using a Weibull probability distribution. Describe this curve. Suppose that a company measures its project

progress using such a curve. Describe and explain the impact of two of the pressures testers are likely to face early in the testing of the product and two of the pressures they are likely to face near the end of the project

LONG 4

SoftCo publishes software. Their president hates Easter Eggs and has instructed the test group to find every one (if there are any) in the product it is testing. As lead tester, it is your task to figure out how to test for Easter Eggs and when to declare the job done. How will you decide when you have finished this task? Present your ideas, their strengths and weaknesses.

LONG 5

Distinguish between using code coverage to highlight what has not been tested from using code coverage to measure what has been tested. Describe some benefits and some risks of each type of use. (In total, across the two uses, describe three benefits and three risks.)

LONG 6

Suppose that a test group's mission is to achieve its primary information objective. Consider (and list) three different objectives. For each one, how would you focus your testing? How would your testing differ from objective to objective?

LONG 7

While testing a browser, you find a formatting bug. The browser renders single paragraph blockquotes correctly—it indents them and uses the correct typeface. However, if you include two paragraphs inside the <blockquote>…</blockquote> commands, it leaves both of them formatted as normal paragraphs. You have to mark each paragraph individually as blockquote.

Consider the consistency heuristics that we discussed in class. Which three of these look the most promising for building an argument that this is a defect that should be fixed?

For each of the three that you choose:
• Name the heuristic
• Describe research that this heuristic suggests to you
• Describe an argument that you can make on the basis of that research

LONG 8

Imagine writing a program that allows you to feed commands and data to Microsoft Excel and to Open Office Calc. You have this program complete, and it’s working. You have been asked to test a new version of Calc and told to automate all of your testing. What oracles would you use and what types of information would you expect to get from each?

LONG 9

Kaner and Bond define measurement as follows: “Measurement is the empirical, objective assignment of numbers to attributes of objects or events (according to a rule derived from a model or theory) with the intent of describing them.”
Consider this case:

A professor decides to base the grades in her class on the height of her students. The taller the student, the higher the grade. Grades will be assigned on a 1-100 scale. The tallest student earns 100, all other students are given a score that matches the ratio (expressed as a percentage) of their height to the tallest student’s height.

(a) Is this a measurement under this definition?
(b) Justify your answer to (a)
(c) Is this a surrogate measure? Explain why or why not.
(d) Briefly describe three problems with this proposed measure.