CSE 4321/5321 Homework 3

Spring 2019

Question Weighting:

Question 1- 5 - 20 % credit each - total 100% credit

Use the EBP approach for each problem.

1. Develop CFG (reduced) and cyclomatic complexity.
2. Develop basis path set.
3. Determine significance on each variable.
4. Add tests for missing Boundary Values not tested, including extreme range values.
5. Add tests for extreme range values for EACH variable that has a BV.
6. For basis path use the all true path as the first test case.

Submittal items, **for each problem** ***submit*** the following

1. Code description - a decision table (except for problem 2 and 5) draw diagram for 5
2. CFG (reduced) - can be hand drawn and scanned
3. Cyclomatic Complexity
4. Test case table with basis paths (put these in the "Comments" column - use the EBP approach - where tests are addition to basis path set use a "-" to indicate the basis path. Make sure all true is the first BP.
5. Code coverage achieved: 4 things: statement, decision, boundary, extreme range coverage
6. Test cases support or refute description?

email: You need to use MCDC for problem 2 and 4 by converting the multiple decision statement into a single decision multiple condition statement and then using MCDC to solve it. Your CFG should still reflect the original code structure though.

Assume:

1. a significance of 1 Cent on financial calculations
2. Assume 0.1 on all doubles, unless otherwise specified.
3. Truncate to the significance for expected outputs.

Proper application of the CFG to the basis path

1. **Start at the upper left and work toward the lower right of the CFG flipping decisions from upper left toward lower right. Make sure to put nodes at subsequent levels on the CFG.**

1) Use basis path testing to develop the test cases for the following code. Use the line (statement) numbers below in your CFG. Use the following template for the test case table. Assume that cart ranges from $0.00 to $10,000.00 both inclusive.



Test case table format:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case Number** | **Inputs** | | | **Exp Out** | **Comments** |
| **member** | **primeStatus** | **cart** | **rate** |

2) Use basis path testing to develop the test cases for the following code. Use the line (statement) numbers below in your CFG. Use the following template for the test case table. Assume that temp ranges from 0.0 to 150.0 degrees F and pressure from 0.0 to 40.0 inHg all inclusive.

14 tests



Test case table format

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case Number** | **Inputs** | | | **Exp Out** | **Comments** |
| **status** | **temp** | **pressure** | **return** |

Use a logical expression to describe the code as in slide 45 of M09

Also,

**Hint: draw ECPs/BVs at statements 10, 14, and 19**

3) Use basis path testing to develop the test cases for the following code. Use the line (statement) numbers below in your CFG. Use the following template for the test case table.

Assume distance ranges from 0.0 to 1,000.0 feet both inclusive and that count is tested as needed to test all boundary values without explicitly testing a maximum value (a minimum should be tested).

ignore count for problem description, extreme ranges



Test case table format:



In your code description (decision table) ignore the variable count (leave it out of the table)

4) Use basis path testing to develop the test cases for the following code. Use the line (statement) numbers below in your CFG. Use the following template for the test case table Assume that cart ranges from $0.00 to $10,000.00 both inclusive. Assume that bonusPoints ranges from 0 to 1,000 both inclusive. Also assume that tax rate is 8.25%

ignore 25: it is a chain, first part do description table, 2nd part after chain test as MCDC

1cfg, cycl compl of 9, 5 for first part. only flip 1 node each time, but will have to alter basis path

17 test cases: look at T/F part of mcdc



Test case table format:



For your code description of this problem - only describe statements 11-23 in a decision table. Use a logical expression for statements 27-35. Make sure to provide test cases that test statements 27-35 using MCDC and indicate this in your test case table or explanation.

5) Use basis path testing to develop the test cases for the following code. Use the line (statement) numbers below in your CFG. Use the following template for the test case table. Assume that x ranges from -5.0 to 8.0. Assume both x and y are significant to 0.01 (use Excel's answer without trunctation).

8 equivalencis, 23 test cases including max for quadratic



Add tests as follows:

1. For each linear region, in the middle of the ECP.
2. For each parabolic - at the max/min and mid-range (mid-range of x) on one side of the max/min. (2 tests total).

**Submit the graph with your solution. Develop your tests using the graph. You may hand draw the graph and scan BUT IT MUST BE GRADEABLE.**

Test Case table format

