HOMEWORK 6 / Project 3 – White Box Testing Exercise

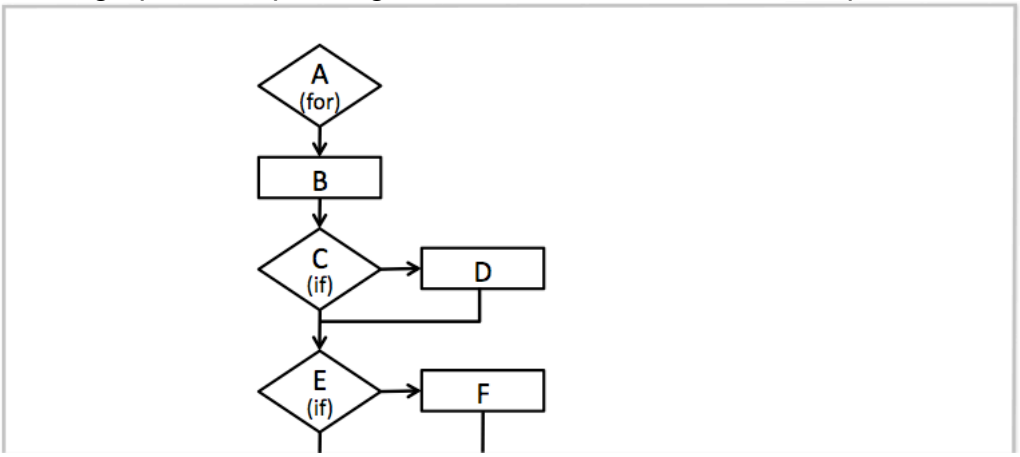
1. Start with the code you wrote for to detect “similar passwords” due to “identical substrings” in Project 2. (This assignment might be easier if this code is in its own class or subroutine.)
2. Draw a flow graph of your code. Calculate McCabe’s complexity metric for this flow graph. To continue with this assignment, it should be at least 5 and no more than 10.
3. Analyze the resulting flow graph to determine what would be needed to achieve statement, branch, and path coverage. Create a set of paths that achieve each one. (In the case of path coverage, you can limit this to simple paths if your code has loops).
4. Check to see if your 30-case test plan achieved statement and branch coverage.
5. If it did, provide a set of test cases that achieved the coverage. If it did not, show which test cases achieved most of the coverage, and then add new test cases for the uncovered paths.

As an example, here’s what to turn in:

1. An annotated printout of the code; it might look like this, for example:

```
A for (int i = 0; i < pass_vect.size(); i++)
    {
B   testword = pass_vect.at(i)[0];
    uppercount = 0;
    lowercount = 0;
    numbercount = 0;
    //size & space tests
C   if (testword.size() < 9 || testword.size() > 24)
      {
D       cout<<"Password "<<testword<<" at line "<< ((i+1)*4)-3 <<" is illegal size."<<endl;
      }
E   if (testword.find_first_of(" ") != -1)
      {
F       cout<<"Password "<<testword<<" at line "<< ((i+1)*4)-3 <<" contains illegal character: space."<<endl;
      }
```

2. A flow graph corresponding to the annotated code; for example:



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3. Create a list of paths that would be required to achieve statement, branch, & path coverage; for example:

Statement Coverage:
ABCDEFG

Branch Coverage:
ABCDEFG
ABCEG

Path Coverage:
ABCDEFG
ABCDEG
ABCEFG
ABCDG

4 & 5. For statement and branch coverage only, provide a subset of the test cases from your test plan that covered each branch, or, if a path from Step 3 was not taken by any of the cases in your original test plan, write a new test case that would traverse that path. This part of your assignment should look something like this:

Statement Coverage:

ABCDEFG

This was traversed by Test Case 8:

New Password: FREEbird1976!!
Old Password: LynyrdSkynyrd1976!?
Previous Password: LynnSwann76ST##L#RS

Branch Coverage:
ABCDEFG
(this already case already provided in Statement Coverage)

ABCEG

This case was not taken by any in the test plan. Here is a new test case that would traverse this path:

New Password: NickelBack_2000+
Old Password: JeffersonNickel_1968.
Previous Password: JeffersonAirplane_1969.

Assignment due dates will be specified on Pilot.