CS 3750 Application 02: White Box Testing

Objective

This assignment will give you practice using each of the two strategies we have seen for white box testing. Being able to use these strategies is a learning outcome for the course, as well as a typical question for quizzes and final exams.

Directions

Answer the following questions regarding white box testing. Submit either an electronic copy of your responses by e-mail to andrew.berns@uni.edu or a physical copy of your responses to me in class. The recommended due date is Friday, March 23.

Questions

Control Flow Testing

1. Draw a control flow graph for the Java method given below.

```java
public int cfgExampleOne( int a, boolean b ) {
    int returnNum = a * a;
    for( int i = 1; i < a && b; i++ ) {
        returnNum = returnNum + i;
        if( returnNum % 2 == 0 ) {
            returnNum = returnNum + 3;
        }
    }
    return returnNum;
}
```

2. Generate a basis path set for the Java method above.

3. Generate a set of test inputs which would realize each path in the basis path set you created above or argue this is not possible.
Data Flow Testing

4. Draw a data flow (def-use) graph for the Java method given below.

```java
public void dfgExampleOne( int a, int b, int c ) {
    a = a * 2;

    if( a < 200 ) {
        b = b + c;
    }

    c = b;

    while( a > b ) {
        System.out.println( a + " , " + b + " , " + c );
        a--;
    }
}
```

5. Below are several sets defined with respect to the Java method given above, with node numbers corresponding to line numbers. List the elements of the sets given below. For each element, include a subpath which shows the element belongs to the set.

- dcu(a, 1)
- dcu(b, 1)
- dpu(b, 1)
- dcu(b, 5)
- dpu(a, 12)

6. Give a set of inputs that would satisfy the all-c-uses/some-p-uses coverage metric for the given Java method or argue this is not possible.