# SQA Assignment 3 – Spring 2017

## Due: Wednesday, March 8, 2017 (beginning of class)

**Problem Descriptions:**
**The purpose of this assignment is to reinforce the lecture material on variable definition/usage and DU path. For each of the source code fragments below:**
**1) Construct a table listing all the line numbers where a variable is defined or used. You must list all the variables in each source code fragment.**
**2) Construct a DU Path table showing all paths from any** definition **to usage of every variable.**

**A sample example is given below:**

```
1   int main()
2   {
3       int num1;
4       int num2;
5       int answer;
6       printf (“This program finds the product of two numbers\n”);
7       printf (“What is your first number?\n”);
8       scanf (“%d”, &num1);
9       printf (“What is your second number?\n”);
10      scanf (“%d”, &num2);
11      answer = num1*num2;
12      printf (“Your first number was %15d\n”, num1);
13      printf (“Your second number was %15d\n”, num2);
14      printf (“The product is %22d\n”, answer);
15      return 0;
16  }
```

DEF-USE Table

| Variable | DEF | USE |
|---|---|---|
| num1 | 3,8 | 11,12 |
| num2 | 4,10 | 11,13 |
| answer | 5,11 | 14 |

DU Path Table

| Variable | # | DU Path |
|---|---|---|
| num1 | 1 | 8-9-10-11 |
| | 2 | 8-9-10-11-12 |
| num2 | 1 | 10-11 |
| | 2 | 10-11-12-13 |
| answer | 1 | 11-12-13-14 |

## Problem 1

```
1. #include<iostream>
2. using namespace std;
3. int main() {
4.  double pens;
5.  double pencils;
6.  double books;
7.  double total;
8.  double finalCost;
9.  cout << "How much have you spent on pens? ";
10. cin >> pens;
11. cout << "How much have you spent on pencils? ";
12. cin >> pencils;
13. cout << "How much have you spent on books? ";
14. cin >> books;
15. total = pens + pencils + books;
16. if ( (books + pens) >= 500 && total > 750 ) {
17.   finalCost = total – (total * 0.75);
18. }
19. if ( (pens + pencils) >= 250 && total > 1000 ) {
20.   finalCost = total – (total * 0.95);
21. }
22. else {
23.   finalCost = total;
24. }
25. cout << "You should Pay: ";
26. cout << finalCost;
27. return 0;
28. }
```

## Problem 2

```
1. #include<iostream>
2. using namespace std;
3. int main()  {
4.    int ip1, ip2, ip3, ip4;
5.    cin >> ip1;
6.    cin >> ip2;
7.    cin >> ip3;
8.    cin >> ip4;
9.    if (ip1 + 3 > ip2) {
10.      ip1 = ip1 * 3;
11.      ip4 = ip4 * 5;
12.   }
13.   if (3 * ip3 > ip4) {
14.      ip2 = 10;
15.      ip3 = ip2 * 8;
16.   }
17.   else {
18.      ip1 = (4 * ip2) + ip3;
19.      ip3 = ip4 * 9;
20.   }
21.   if ( ip1 + 7 > ip4) {
22.      ip2 = 2 * ip3;
23.      ip4 = 0;
24.   }
25. cout << ip1 << endl << ip2 << endl << ip3 << endl << ip4;
26. return 0;
27. }
```