SQA Assignment 3 – Spring 2021

Due: 11:59 PM, Thursday, 3/11

Questions: Contact XIAOPU PENG <xzp0007@auburn.edu>

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.      char operator;
3.      double 1stNum, 2ndNum;
4.      printf("Enter an operator (+, -, *,): ");
5.      scanf("%c", & operator);
6.      printf("Enter two operands: ");
7.      scanf("%lf %lf", & 1stNum, & 2ndNum);
8.      if (operator == '+') {
9.          printf("%.1lf + %.1lf = %.1lf", 1stNum, 2ndNum, 1stNum + 2ndNum);
10.     } else if (operator == '-') {
11.         printf("%.1lf - %.1lf = %.1lf", 1stNum, 2ndNum, 1stNum - 2ndNum);
12.     } else if (operator == '*') {
13.         printf("%.1lf * %.1lf = %.1lf", 1stNum, 2ndNum, 1stNum * 2ndNum);
14.     } else if (operator == '/') {
15.         printf("%.1lf / %.1lf = %.1lf", 1stNum, 2ndNum, 1stNum / 2ndNum);
16.     } else {
17.         printf("Error! operator is not correct");
18.     }
19.     return 0;
20. }
```

DEF –USE Table:

Variable	DEF	USE
operator	2, 5	8, 10, 12, 14

1stNum	**3, 7**	**9, 11, 13, 15**
2ndNum	**3, 7**	**9, 11, 13, 15**

DU Path Table:

Variable	#	DU Path
operator	**1**	**5-6-7-8**
	2	**5-6-7-8-10**
	3	**5-6-7-8-10-12**
	4	**5-6-7-8-10-12-14**
1stNum	**1**	**7-8-9**
	2	**7-8-10-11**
	3	**7-8-10-12-13**
	4	**7-8-10-12-14-15**
2ndNum	**1**	**7-8-9**
	2	**7-8-10-11**
	3	**7-8-10-12-13**
	4	**7-8-10-12-14-15**

Problem 1

```
1	#include <stdio.h>
2	void main()
3	{
4		float testWeight=0.5;
5		float testGrade, hwGrade;
6		printf("Input the values for test grade and homework grade : ");
7		scanf("%f %f",&testGrade,&hwGrade);
8		float finalGrade = testGrade * testWeight + hwGrade * (1-testWeight);
9		if( finalGrade >= 90 ){
10			printf("test grade %f  homework grade %f result an A.\n", testGrade, hwGrade);}
11		else if( finalGrade >= 80 && finalGrade < 90){
12			printf("test grade %f  homework grade %f result an B.\n", testGrade, hwGrade);}
13		else if( finalGrade >= 70 && finalGrade < 80){
14			printf("test grade %f  homework grade %f result an C.\n", testGrade, hwGrade);}
15		else if( finalGrade > =60 && finalGrade < 70){
16			printf("test grade %f homework grade %f result an D.\n", testGrade, hwGrade);}
17		else{
18			printf("test grade %f  homework grade %f result an F.\n", testGrade, hwGrade);}
19	}
```

Problem 2

```
1       int main() {
2               double running;
3               double runCa;
4               double swimming;
5               double swimCa;
6               double goal;
7               double totalCa;
8               cout << "How long did you run? (in minutes) ";
9               cin >> running;
10              cout<<”How many the calories from running 1 minute?”
11              cin>>runCa;
12              cout << "How long did you swim? (in minutes) ";
13              cin >> swimming;
14              cout << " How many calories from swimming 1 minute? ";
15              cin >> swimCa;
16              cout << “What’s your goal for today? (in calories)”;
17              cin >> goal;
18              totalCa = swimming * swimCa + running * runCa;
19              if (totalCa >= goal){
20                      cout << "Take a break for the rest of your day."}
21              else {
22                      goal = goal – totalCa;
23                      cout<<”Your left work towards today’s goal is:”;
24                      cout<<goal;
25                      Swimming = goal / swimCa;
26                      cout << “Minutes you may swim: ”;
27                      cout << Swimming;
28                      running = goal / runCa;
```

```
29                      cout << “Minutes you may run:”;
30                      cout << running;}
31              return 0;
32      }
```