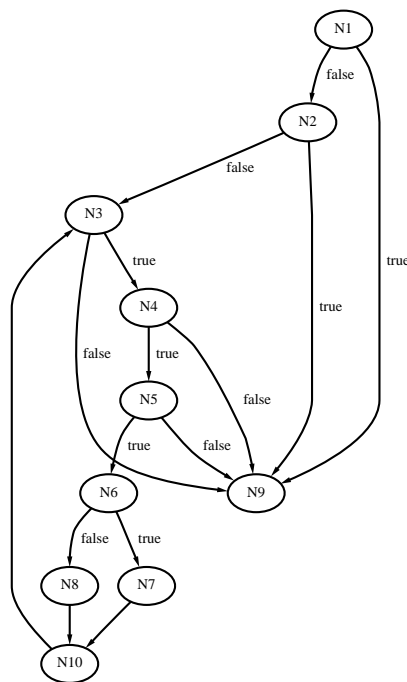


# Software Design (F28SD2): Exercises in Static Analysis *Solutions*

Andrew Ireland  
School of Mathematical and Computer Sciences  
Heriot-Watt University  
Edinburgh

## Exercise 1



BRANCH

`if ((lower < 0) || (upper >= max))`

`while ((data[index] > 0) && (index <= upper) && !found)`

`if (data[index] == val)`

NODES

N1 and N2

N3, N4 and N5

N6

The flow graph for `finddata` contains 10 nodes and 15 edges so the cyclomatic complexity is 7, *i.e.*  $(15 - 10) + 2 = 7$ .

## Exercise 2

The backward program slice takes the form:

```
while (x > 0) {  
    x = x div 2;}  
screen.println("x = " + x);
```

Note that when calculating the program slice we are only interested in statements that affect the final value of `x`.

## Exercise 3

The forward program slice takes the form:

```
int s = 0;  
s = s + k;  
screen.println("s = " + s);
```

Note that when calculating the program slice we are only interested in statements that are affected by the initialization of `s`.