Software Verification
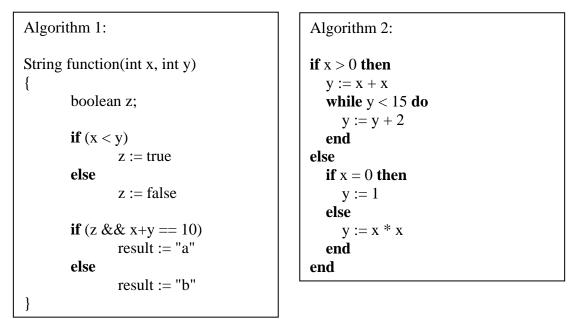# Exercise Session: Testing Criteria

For each of the following algorithms, answer the questions that follow:

```
Algorithm 1:

String function(int x, int y)
{
        boolean z;

        if (x < y)
                z := true
        else
                z := false

        if (z && x+y == 10)
                result := "a"
        else
                result := "b"
}
```

```
Algorithm 2:

if x > 0 then
    y := x + x
    while y < 15 do
        y := y + 2
    end
else
    if x = 0 then
        y := 1
    else
        y := x * x
    end
end
```

Branch and path coverage

(a) How many branches are present?
(b) Is it possible to test every branch? Provide a set of tests to exercise as many branches as possible.
(c) How many paths are present?
(d) Which path(s) remain untested by your tests of (b)?
(e) Is it possible to test all the paths? Add tests, if required, to do so.

Predicate coverage

(a) Write down the predicates that occur in the code.
(b) Is it possible to obtain full predicate coverage? Provide a set of tests which will obtain the highest predicate coverage.

Clause coverage

(a) Write down the clauses appearing in the code.
(b) Can we exercise full clause coverage? Write tests for maximal clause coverage.