Problem Sheet 11: Testing

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For both of the following algorithms, answer the coverage-related 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
```

1 Branch and Path Coverage

i. How many branches are present?

ii. Is it possible to test every branch? Provide a set of tests to exercise as many branches as possible.

iii. How many paths are present?

iv. Which path(s) remains untested by your tests in part (ii)?

v. Is it possible to test all the paths? Add tests, if required, to do so.

2 Predicate Coverage

i. Write down the predicates that occur in the code.

ii. Is it possible to obtain full predicate coverage? Provide a set of tests that will obtain the highest predicate coverage.

*Exercise sheet adapted from an earlier version by Stephan van Staden.

3 Clause Coverage

i. Write down the clauses appearing in the code.

ii. Can we exercise full clause coverage? Write tests for maximal clause coverage.