Problem Sheet 11: Testing

Chris Poskitt*
ETH Zürich

For both of the 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. Add tests, if needed, to achieve path coverage.

2 Logic 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.

iii. Write down the clauses appearing in the code.

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

 v. <u>In general</u>, does predicate and/or clause coverage imply branch coverage?

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