

## More Inadequacy of Program Testing

The previous testing example focussed on the program structure and covering all control paths with tests. An alternative strategy is “functional (or black box) testing”. With this approach the functional requirements guide the test choices, not program structure. For the previous example where we want to assure that  $M = \max \{A, B, C, D\}$ , any one of the four values could turn out to be the maximum, and so we need a test for each of these cases. In our previous testing example, our tests failed to cover all these cases.

For functional testing of  $M = \max \{A, B, C, D\}$  we propose the following test runs:

1.  $A = 4, B = 1, C = 3, D = 2$
2.  $A = 3, B = 5, C = 2, D = -2$
3.  $A = 2, B = -3, C = 6, D = 3$
4.  $A = 2, B = -3, C = 3, D = 7$

Now if a program passes each of these tests and yields the correct value for  $M$  (4, 5, 6, and 7, respectively), are we justified in concluding it is correct? After you give your answer, look at the next page.

